NORTH CAROLINA DEPARTMENT OF AGRICULTURE
& CONSUMER SERVICES

STRUCTURAL PEST CONTROL DIVISION
REGISTERED TECHNICIAN TRAINING PROGRAM

THE REGISTERED TECHNICIAN INTRODUCTORY TRAINING WORKBOOK

THE REGISTERED TECHNICIAN INTRODUCTORY TRAINING WORKBOOK

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What Is the Registered Technician Training Program

The **REGISTERED TECHNICIAN TRAINING PROGRAM (RTTP)** is a mandatory verifiable pesticide training program designed to ensure a minimum level of training for all structural pest control registered technicians. *The North Carolina Department of Agriculture & Consumer Services Structural Pest Control Division* (SPCD) is the state regulatory agency responsible for the administration of the **RTTP**. There are three parts to the **RTTP**: 1) The Introductory Training Workbook; 2) On-the-Job Training; and 3) The Registered Technician School. The trainee is not permitted to mix or apply pesticides without on-site supervision by a licensee, certified applicator, or a registered technician for a minimum of three days or until the trainee completes the **REGISTERED TECHNICIAN INTRODUCTORY TRAINING WORKBOOK,** whichever is longer. All three parts of the **RTTP** must be completed within 75 days of employment.

Purpose of the Registered Technician Introductory Training Workbook

The **REGISTERED TECHNICIAN INTRODUCTORY TRAINING WORKBOOK** contains information about pesticide labels and pesticide safety with which you must be familiar to become a structural pest control registered technician in North Carolina. Though it is primarily a resource for structural pest control pesticide applicators seeking technician registration, the workbook would also be useful to anyone involved in, or wishing to learn more about pesticide labels.

The **REGISTERED TECHNICIAN INTRODUCTORY TRAINING WORKBOOK** focuses on the safe and proper use of pesticides through a better understanding of the language contained in pesticide labels. Use of the **WORKBOOK** benefits the structural pest control technician and the general public. By learning how to handle pesticides correctly, applicators will be able to protect themselves, others, property, and the environment from adverse effects of pesticides. In doing so, they will ensure the continued use of, and benefits from, pesticides as valuable tools in structural pest management.

On-Site Supervision

A registered technician trainee is under the direct on-site supervision of a licensed commercial applicator, certified applicator, or registered technician of 2 years experience if the individual is acting under the instructions and control of the supervisor who is responsible for the actions of the trainee and who is continuously physically present at the time and place of the pesticide mixing and application activity.

How to Use the Workbook

At the beginning of each of the units there is a list of **"Terms To Know."** Read through these terms first. It is important that you understand these terms as you read each unit. The **"Terms To Know"**are underlined in your **REGISTERED TECHNICIAN INTRODUCTORY TRAINING WORKBOOK.**

At the end of each of the units you will be required to answer questions to determine your understanding of the training material. The questions are designed to help in your overall understanding of the information and should not be considered a test that you must pass the first time.

Try to answer the questions by yourself first. If you have trouble with a question in a unit, review that unit. If you still have trouble you may need to refer to an earlier unit; questions may come from material in that unit or from units already completed. If you continue to have difficulty in answering any of the questions, ask your supervisor or trainer for assistance. As a last resort, answers to the questions can be found at the end of the **WORKBOOK**. You and your trainer, supervising licensee or certified applicator must then sign and date that you have completed each unit in the **WORKBOOK.**

The use of trade names, suppliers, or other private labels in the Registered Technician Introductory Training Workbook are for illustration only. No product endorsement is implied nor is discrimination intended toward similar products or materials not mentioned or listed.

TERMS TO KNOW

Key words or terms in your **REGISTERED TECHNICIAN INTRODUCTORY TRAINING WORKBOOK** are represented as **underlined** text. Your understanding of key words or terms is crucial to your overall comprehension of the subject matter contained in this unit and throughout other units of your **Registered Technician Introductory Training Workbook.**

Diluent — Anything used to dilute a pesticide. The most commonly used diluent is water.

Environment — Is everything that is around us. It includes all living organisms, such as man and other animals, insects, plants, air, soil, and water. As a registered technician trainee, you must be aware that this definition also includes homes, offices, factories, schools, and all that is contained within these structures.

EPA — A Federal government agency responsible for the review of a pesticide manufacturers' application for product registration. The Agency determines that the use of the pesticide will not present an unreasonable risk to humans or the environment.

Label — The written, printed, or graphic matter on or attached to the pesticide or device or any of its containers or wrappers. This includes label instructions that "refer" the pesticide user to other labeling documents intended for the safe use of the pesticide.

Labeling — All labels and all other written, printed, or graphic matter accompanying the pesticide or device at any time or to which reference is made on the label or in literature accompanying the pesticide or device. Labeling is not necessarily attached to or part of the pesticide container.

Personal Protective Equipment — Equipment designed to prevent pesticides from contacting your body or clothing. This equipment also protects your eyes and prevents inhaling of pesticides.

Pest(s) — A pest is any living organism, including but not limited to, insects, rodents, birds, and fungi that:

a) competes with humans and domestic animals for food and water.

b) injures humans, animals, structures, or possessions.

c) spreads disease to humans and domestic animals

d) annoys humans or domestic animals

Pesticide — a substance or mixture of substances intended to prevent, destroy, repel, or mitigate any pest.

As a registered technician, you will use a variety of tools to control structural pests. Pesticides will probably be among those tools. It is important that you understand from the beginning what a pesticide is. The Environmental Protection Agency defines a pesticide as "any substance or mixture of substances for preventing, destroying, repelling, or mitigating any pest."

One of the most important tools that you will use as a structural pest control registered technician trainee is the **pesticide label**. Pesticide manufacturers are required by law to put certain instructions on the label. Failure to apply a pesticide in accordance with the label directions *can result in legal action* against the violator.

THE INSTRUCTIONS ON A LABEL ARE NOT TO BE CONSIDERED ADVICE OR SUGGESTIONS THAT YOU MAY OR MAY NOT FOLLOW WHEN APPLYING PESTICIDES. . .THE INSTRUCTIONS ON THE LABEL MUST BE FOLLOWED!

Pesticide Registration

Every pesticide must be registered with the federal U.S. Environmental Protection Agency (US **EPA**) as well as with the **North Carolina Department of Agriculture & Consumer Services** Pesticide Section before it can be sold in North Carolina.

The registration procedure is intended to ensure the proper and safe use of pesticides and to protect people and the **environment** from ineffective or hazardous pesticides.

EPA Registration Number

An EPA registration number (for example **EPA REG. NO.4758-137**) must appear on all pesticide labels. This indicates that the pesticide product has been registered and its label approved by the EPA. Most products will contain only two sets of numbers. In the above example, the first set of numbers, **4758**, identifies the manufacturer; the number **137** identifies the pesticide product. If a third number is present, this identifies the product as a supplemental registration, identical to the primary registration but made for another company under its special name.

The EPA registration number is NOT a guarantee of safety in all pesticide application situations. The safe use of pesticides can only come through a comprehensive pesticide applicator training program, such as your RTTP, and strict adherence to label directions.

EPA Establishment Number

This number, for example **EPA EST. No. 11715-NC-1**, identifies the facility that produced the product and is useful in case a problem develops or the product is found to have been contaminated. As with the registration number, the first set of numbers, **11715**, identifies the manufacturer. The letters **NC**, in this example, identify the state of the manufacturer as North Carolina. The number **1** identifies the chemical plant within the state.

The registration number and establishment numbers are needed by the pesticide applicator in situations involving accidental poisoning, claims of misuse, or liability claims.

Label and Labeling

Pesticide labeling is the main method of communication between a pesticide manufacturer and you, the pesticide applicator. The information printed on or attached to the pesticide container is the **label**. **Labeling** includes the label itself, plus all other information you receive from the manufacturer about the product when you buy it. The labeling includes brochures, leaflets, and other information that accompanies the pesticide product. Pesticide labeling gives you instructions on how to use the product safely and correctly. **Pesticide users are required by law to comply with all the instructions on a pesticide label.**

The pesticide label provides instructions on:

- how to mix a pesticide
- how, where, and when to apply a pesticide
- where **not** to apply a pesticide
- the proper storage of a pesticide
- how to properly dispose of the pesticide container when it is empty
- how to dispose of excess pesticide
- what to do in case anyone has been exposed to the pesticide

The wording on a label is proposed by the manufacturer of the pesticide and approved by the United States Environmental Protection Agency (EPA). The EPA specifies what information must be provided on a label. It also requires that a particular format be used for every label, such as the size of the print and where on the label specific information must appear.

When To Read the Pesticide Label

Before purchasing the pesticide

- make sure it is labeled for your intended use.
- are you allowed by the label to apply the pesticide to a specific site, such as a kitchen, crawlspace, attic, food processing area, etc?
- does the pesticide state that it can be used against the **pest(s)** you are attempting to control?
- does the pesticide require special application equipment?
- do you have the **personal protective equipment (PPE)** required by the label for its use?

Before mixing and applying the pesticide

- do you have the proper personal protective equipment that is required for proper mixing and application of the pesticide?
- do you know what first aid and medical treatments are required by the pesticide label in the event of an accident?
- do you know what **diluent** should be used to mix the pesticide?

When storing the pesticide

- how should you store the pesticide to prevent breakdown or contamination?
- does this pesticide require the storage area to be posted with warning signs?
- can this pesticide be stored safely with other pesticides?
- always store the pesticide out of the reach of children or animals.
- are there any other storage requirements listed on the pesticide label?

Before disposing of excess pesticide and empty pesticide containers

- can you simply dispose of the pesticide in the trash dumpster?
- do you need to rinse the container?
- can the empty containers be recycled?

NEVER burn, bury, or dump excess pesticide or pesticide containers. To do so is a violation of Federal and State regulations!

The statement "**always read and follow all label directions**" is perhaps the most important overall statement you will hear in your work and throughout this **WORKBOOK.** The primary reason for the development of this **WORKBOOK** is to help you better understand labels. Each of the major pesticide label components will be discussed as individual units within this **WORKBOOK.**

TEST YOUR UNDERSTANDING

Upon completion of each of the units contained in the **Registered Technician Introductory Training Workbook,** you will be required to answer questions to ensure your understanding of the training material.

The questions may be from material contained in the unit you are currently completing or from units already completed.

The questions should be considered an important part of the pesticide label learning process and should not be considered a test that you must pass the first time in order to complete the **WORKBOOK**.

Try to answer the questions by yourself. However, if you have difficulty in answering any of the questions, ask your designated trainer for assistance! Answers to the questions can be found at the end of the **WORKBOOK**.

MULTIPLE CHOICE.

Select the **best** answer of the 4 choices provided:

I.1 The best source of information on how to use a pesticide can be found by:
- a contacting another structural pest control operator
- b reading the label
- c calling the individual who sells the pesticide
- d asking a farmer

I.2 The directions for use on a pesticide label:
- a are not required to be read by experienced pesticide applicators
- b are intended only for those unfamiliar in using pesticides
- c require that all pesticide use activities be made in strict accordance to the directions
- d don't need to be followed *every* time you use the product

I.3 Who has the responsibility to apply a pesticide according to the directions on the label?
- a the applicator of the pesticide
- b the pesticide manufacturer
- c the EPA
- d your local enforcement agency

I.4 When using a pesticide, how often should you refer to and "read the pesticide label"?
- a if you read it slowly, once should be enough
- b two to three times if it's a new pesticide
- c every 10 days
- d as often as necessary to apply the pesticide correctly and safely

I.5 When is it permissible to bury or burn excess pesticide?
a. whenever weather conditions are favorable to prevent pesticide pollution
b. if the pesticide container is water soluble
c. never
d. if the pesticide container is glass or metal

FILL-IN THE BLANK.

Complete each statement with the appropriate word(s):

I.6 To comply with the requirements of the RTTP, on-site supervision must be conducted for a minimum of _____ days or until the _____ has been completed.

I.7 The _____is the regulatory agency responsible for the administration of the North Carolina **Registered Technician Training Program.**

I.8 Equipment designed to prevent pesticides from contacting your body or clothing is called _____.

I.9 A substance or mixture of substances that is intended to prevent, destroy, repel, or mitigate any pest is called a _____.

I.10 A _____ is the written, printed, or graphic matter on or attached to the pesticide or device or any of its containers or wrappers.

I.11 An EPA _____ _____ must appear on all pesticide labels.

I.12 The pesticide _____gives you instructions on how to use the product safely and correctly.

I.13 Failure to apply a_____ properly can result in legal action against the violator if the instructions on a pesticide label are not followed.

I.14 Pesticide applicators are required by_____ to comply with all the instructions and directions that appear on a pesticide label.

I.15 The pesticide label is a document which provides instructions on how to:

_____

_____

_____ (Provide 3 label instructions).

TRUE OR FALSE.

Read each question. Decide if the statement is true (**T**) or false (**F**). Circle your answer.

I.16 An EPA registration number indicates that the pesticide has been registered and its label approved by the EPA.

T F

I.17 The establishment number appears on either the pesticide label or pesticide container.

T F

I.18 The labeling may include brochures, leaflets, and other information that accompanies the pesticide product.

T F

I.19 It is a violation of Federal and State regulations to burn, bury, or dump excess pesticide or pesticide containers.

T F

1.20 The safe use of pesticides can only come through strict adherence to label directions.

T F

Upon completion of each unit in the **Registered Technician Introductory Training Workbook**, the unit must be signed and dated by the designated trainer and the registered technician trainee.

When all units of the **Registered Technician Introductory Training Workbook** are completed by the registered technician trainee, the signature of the licensee at the end of Unit 8 will verify successful completion of the **Workbook**.

_____ _____

Registered Technician Trainee **Date**

_____ _____

Designated Trainer **Date**

NOTES:

TERMS TO KNOW

Active Ingredient	The active ingredient, abbreviated "a.i.", is the material in a pesticide formulation that actually controls (prevents, destroys, repels) the target pest.
Degradation	The breakdown of a pesticide, by environmental factors or microorganisms, into an inactive or less active form(s).
Dermal	Pertaining to the skin. One of the major ways pesticides can enter the body to possibly cause harm.
Exposure	Coming in contact with a pesticide.
Ground Water	Ground water is water located beneath the earth's surface. Often, it is water trapped in pools, called aquifers. Ground water is one of the primary sources of water for drinking and irrigation.
Hazard(s)	The risk of harmful effects from pesticides. Hazard depends on both the toxicity of the pesticide and the exposure received.
Inert Ingredient	Material(s) in a pesticide formulation that are not active ingredients. The inert ingredient(s) are added to dilute the a.i. and improve the mixing and handling qualities of the pesticide. Inert ingredients may be hazardous to humans, animals, and plants.
Leaching	The movement of pesticide downward through the soil, usually by being dissolved in water, with the possibility of reaching groundwater.
Organism(s)	Any living thing(s).
Residue	Traces of the active ingredient or breakdown product of a pesticide that remain and can be detected in crops, soil, water or the environment following the use of a pesticide.
Persistent	A pesticide that remains active in the environment for long periods of time because it is not easily broken down by micro-organisms or other environmental factors.
Federal Registration	A pesticide registered by the US EPA.
State Registration	A pesticide must be registered with the appropriate state agency before it can be sold in the state.
Toxicity	The potential a pesticide has for causing harm to humans.

Chemicals used in structural pest control are collectively known as pesticides.

Pesticides control insects, fungi, rodents, weeds, and other pests. Pesticides are developed from naturally-occurring compounds or are made in laboratories (synthetic pesticides) by chemists. On average, only one in 20,000 chemicals tested makes it through the development and screening process to become a commercially successful pesticide.

Every pesticide must be registered with the **United States Environmental Protection Agency (EPA)**, including those that you will use in structural pest control.

Each pesticide is subjected to rigorous health, safety and environmental tests. **Safety** is the most important factor in pesticide research and development. When used properly, pesticides must not create an unreasonable risk to the user or the environment.

Pesticides are strictly regulated under the *Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).*

Pesticide manufacturers that have pesticides registered with the US EPA **(Federal registration)** will display an EPA approved label on their containers. To the manufacturer, registration means the pesticide may be legally sold and distributed in the United States. To the pesticide applicator, the label states how to use the pesticide correctly and legally. To physicians, the label provides information for proper medical treatment in cases of exposure to pesticide.

The EPA requires that pesticide labels list precise instructions for all **pesticide handling activities**. Some of these instructions provide valuable information regarding:

- personal protective equipment (PPE) requirements for pesticide applicators
- directions on mixing the pesticide
- warning statements about specific **hazards** when using the pesticide
- environmental warnings
- proper container disposal
- competency training (state certification) for those handling specific pesticides

Each time you handle a pesticide, you get *detailed* instructions on how to use it—right on the container label! It is your main source of information on how to use product **correctly, safely, and legally.** A recent survey promoted by a leading pest control magazine asked readers which pesticide topic was most important for training of new hires. Seventy-two percent responded that **label comprehension** was the key to ensuring a better understanding of pesticides.

The label is your source of special safety measures needed to protect yourself, those around you, and the environment. In case of an accident or **overexposure**, the label identifies the pesticide's active ingredient so medical personnel can provide immediate and proper treatment.

The label helps you achieve maximum benefits at a minimum risk. Going against the instructions may make the pesticide ineffective and, even worse, dangerous to you! As a new employee in the structural pest control industry, you should develop the habit of reading the label **before**:

- purchasing the pesticide
- mixing the pesticide
- applying the pesticide
- storing the pesticide
- disposing of the pesticide

Don't make the mistake of relying on your memory to recall important information on the label —it's too easy to forget! After all, you are not required to memorize the instructions on every pesticide label; but you **must** have the label readily accessible at all times and refer to it whenever needed.

Information on a pesticide label is usually grouped under major headings to make it easier to find the information you need. Some information is required by law to appear on a certain part of the label or under certain headings. Other information may be placed wherever the manufacturer chooses. Table 1.1 and the **Ficam** insecticide label on the following pages show the format and information required by the EPA on pesticide labels.

Table 1.1

1	**Company Name And Address**	The manufacturer of the pesticide.
2	**Brand Name**	The name under which the product is sold.
3	**Net Contents**	This indicates how much product is in the container.
4	**EPA Registration Number**	The registration number assigned to the pesticide by the EPA at the time of registration.
5	**EPA Establishment Number**	The final facility at which the pesticide was produced.
6	**Type of Pesticide**	The term pesticide is a broad term under which insecticides, fungicides, and herbicides fall. Insecticides control insects, fungicides control fungal diseases and wood-decay fungi, and herbicides control brush and weed growth.
7	**Ingredient Statement**	The label of each pesticide must bear a statement which contains the name and percentage by weight of each **active ingredient** and the total percentage by weight of all **inert ingredients**.
8	**Precautionary Statements**	Required warnings and precautionary statements concerning the general areas of hazard including hazards to children, environmental hazards and physical or or chemical hazards.
9	**Child Hazard Warning**	Every pesticide label shall bear on the front panel the statement **"Keep out of Reach of Children"**.
10	**Human Hazard Signal Word**	A signal word is assigned on the basis of the **highest** human hazard (oral, inhalation or **dermal toxicity**) that is most likely to be harmful and which must be particularly protected against.
11	**Statement of Practical Treatment**	Lists the first aid treatment that should be administered to someone accidentally exposed to a pesticide.
12	**Hazards to Humans and Domestic Animals**	These precautionary statements are required indicating the particular hazard, the route(s) of exposure and the precautions to be taken to avoid accident, injury or damage.
13	**Environmental Hazards**	Where a hazard exists to non-target organisms, excluding humans and domestic animals, precautionary statements are required stating the nature of the hazard and the appropriate precautions to avoid potential accident, injury or damage.
14	**Physical or Chemical Hazards**:	Warning statements on the flammability or the explosive characteristics of the pesticide.
15	**Directions For Use**	"It is a violation of Federal law to use this product in a manner inconsistent with its labeling" Directions for use must be stated in terms which can be easily read and understood by the average person likely to use or to supervise the use of the pesticide.
16	**Storage and Disposal**	All pesticide labels include general instructions for the appropriate storage and disposal of the pesticide and its container.
The Label Components in Shaded Areas Are Self-Explanatory and Will Not Be Discussed Further in the Workbook.		

1

NORAM CHEMICAL COMPANY

FICAM® 2

WASP & HORNET INSECTICIDE SPRAY 6

CONTAINS SYNERGIZED BENDIOCARB

KILLS WASPS, HORNETS, YELLOW JACKETS, BEES, ANTS, AND SPIDERS

NOT FOR SALE OR USE IN CALIFORNIA

DIELECTRIC BREAKDOWN VOLTAGE: 23,000 volts
May be used in or around electrical equipment

ACTIVE INGREDIENTS: Percent by Weight 7
•Bendiocarb(2,2dimethyl1,3benzodioxol4yl methylcarbamate) 0.1%
• • Piperonyl Butoxide Technical 0.5%
INERT INGREDIENTS: 99.4%
TOTAL 100.00%

•Protected by U.S. Patent No 4,056,625
••Equivalent to min. 0.40% (butylcarbityl) (6propylpiperonyl) ether and 0.10% related compounds

EPA Reg. No. 45639-140 4

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KEEP OUT OF REACH OF CHILDREN WARNING 10

STATEMENT OF PRACTICAL TREATMENT 11

IF SWALLOWED: CALL A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY. DRINK 1 OR 2 GLASSES OF WATER AND INDUCE VOMITING BY TICKLING BACK OF THROAT WITH FINGER. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

IF INHALED: REMOVE AFFECTED PERSON TO FRESH AIR. APPLY ARTIFICIAL RESPIRATION IF INDICATED.

IF IN EYES: FLUSH WITH PLENTY OF WATER. CONTACT A PHYSICIAN IF IRRITATION PERSISTS.

IF ON SKIN: REMOVE CONTAMINATED CLOTHING AND WASH AFFECTED AREAS OF SKIN WITH SOAP AND WATER. CONTACT A PHYSICIAN IF IRRITATION PERSISTS. WASH CLOTHING WITH SOAP AND WATER BEFORE RE-USE.

NOTE TO PHYSICIAN: BENDIOCARB IS A CHOLINESTERASE INHIBITOR. ATROPINE SULFATE 2 MG. SHOULD BE GIVEN BY INJECTION AND REPEATED AS NECESSARY UNTIL FULLY ATROPINIZED.

PRECAUTIONARY STATEMENTS 8

HAZARDS TO HUMANS AND DOMESTIC ANIMALS 12

WARNING

May be harmful if swallowed or absorbed through the skin.
Do not get in eyes.
Avoid breathing spray mist.
Avoid contact with skin or clothing.
Wash thoroughly with soap and water after handling.

ENVIRONMENTAL HAZARDS 13

This product is toxic to fish, birds and other wildlife. Do not apply directly to water. Do not contaminate water when disposing of equipment washwaters.

PHYSICAL & CHEMICAL HAZARDS 14

Contents under pressure. Do not use or store near heat or open flame. Do not puncture or incinerate container. Exposure to temperatures above 130°F may cause bursting.

DIRECTIONS FOR USE 15

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Direct spraying will cause damage to plants on contact.
Do not allow spray to contact plastic, rubber, asphalt or stained wood surfaces due to the fact that further staining could result on previously stained cedar surfaces.

Do not use as a space spray indoors.

To be used in and around homes, apartments, commercial buildings, kennels, barns, patios, institutions, warehouses, theaters, office buildings, schools, motels, hotels, transformers, electrical boxes, and those areas where wasp, hornet, bee, and yellow jacket nests are generally located.

To operate, remove protective cap and depress button, being sure to aim spray opening at the location to be sprayed. Direct spray at wasps, hornets, bees, and yellow jackets whenever possible and under eaves, into nests, cracks, holes, or crevices wherever insects are noticed.

Spray for about 12 seconds or until surface is moist from insecticide. To prevent entrance of insects into the house, spray around points where outside plumbing, faucets, etc. enter the house and into any cracks or crevices in foundation as well as along sills and ledges.

Kills wasps, hornets, honeybees, and yellow jackets: This spray is fast acting when insects are hit directly. If a breeze is present,application should be made only with breeze at back. Application should be made in the evening when the hornets are at rest.

Kills ants and spiders: This spray is fast acting when pests are hit directly. With the breeze at back, thoroughly spray all pests present. Allow about 24 hours for those insects or spiders which were not directly hit by spray to leave the area. If insects or spiders, should return to the treated area, spray again. This container delivers a stream type spray, making it possible for the operator to stay back from the places sprayed. This formulation utilizes synergized Bendiocarb, a combination specifically effective on this class of pests. 16

STORAGE AND DISPOSAL

STORAGE: Store in a cool,dry place inaccessible to children and pets. Exposure to temperatures above 130°F may cause bursting.

DISPOSAL: Replace cap, wrap container in several layers of newspaper and discard in trash. Do not incinerate or puncture.

IN CASE OF FIRE, LEAKY OR DAMAGED CONTAINERS, OR OTHER EMERGENCY, REPORT AT ONCE BY TOLLFREE TELEPHONE TO: 8004249300.

IMPORTANT: READ BEFORE USE

By using this product user or buyer accepts the following conditions, warranty, disclaimer of warranties and limitations of liability.

CONDITIONS: The directions for use of this product are believed to be adequate and should be followed carefully. However, because of extreme weather and soil conditions, manner of use and other factors beyond NORAM Chemical Company's control, it is impossible for NORAM to eliminate all risks associated with the use of this product. As a result, crop injury or ineffectiveness is always possible. All such risks shall be assumed by the user or buyer.

DISCLAIMER OF WARRANTIES: THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, WHICH EXTEND BEYOND THE STATEMENTS MADE ON THIS LABEL. No agent of NORAM Chemical Company is authorized to make any warranties beyond those contained herein or to modify the warranties contained herein. NORAM disclaims any liability whatsoever for incidental or consequential damages, including, but not limited to, liability arising out of breach of contract, express or implied NOR-AM Chemical Company. 1991warranty including warranties of merchantability and fitness for a particular purpose), tort, negligence, strict liability or otherwise. FW&H-SL-10M-(900912)-Rev. 12/92

The label on a pesticide is the result of years of research by scientists in both laboratory and field tests. The information on the label takes **10-12** years to obtain and costs the manufacturer millions of dollars!

Before a pesticide is registered, the manufacturer must test the pesticide to determine how hazardous or dangerous it is to humans, wildlife, and other **organisms.** The pesticide manufacturer must have performance data to show that the pesticide will control a particular pest or group of pests on one or more hosts or sites, such as plants, animals, soil, and structures.

The pesticide manufacturer must determine what happens to the pesticide after it is applied to the environment . . .

- does the pesticide **degrade** into harmless materials?
- does it **leach** or move through soil to the **groundwater?**
- how much pesticide **residue** remains in the environment
- how long after the application of the pesticide does it **persist?**

Only after a chemical manufacturer has conducted these and many other required tests, is the chemical manufacturer now ready to submit these data to the EPA for review. The chemical manufacturer asks for pesticide "use registrations" on the crops, animals, or, in the case of structural pest control, application sites, in which it has pest management and safety test data. The chemical manufacturer must support its claims that the pesticide is a safe and useful product when used for its intended purpose and according to label directions.

Federal law strictly defines the information manufacturers must put on pesticide labels. Before a manufacturer can register a product, the US EPA must approve its label language **(Federal registration)**. In North Carolina, and other states, the pesticide must be registered by the appropriate state agency before a pesticide can be sold or used in that state **(state registration).**

The EPA registration process is necessary to protect you, the consumer, and the environment from the potential harmful effects of pesticides and to ensure the proper and safe use of pesticides.

Some labels are very easy to understand; others are complicated. Regardless of the complexity of the label, it is your responsibility to *read and understand the label*. To help you better understand the information on a pesticide label, each of the label components will be discussed in detail in the remaining units of your **Registered Technician Introductory Training Workbook**.

TEST YOUR UNDERSTANDING

MULTIPLE CHOICE.

Select the **best** answer of the 4 choices provided:

1.1 Chemicals used in structural pest control are collectively known as:
a. leaching agents
b. herbicides
c. pesticides
d. diluents

1.2 A pesticide manufacturer's primary responsibility to the environment in developing a pesticide is to:
a. ensure the safety of the product under a wide range of environmental conditions
b. develop pesticides that will never degrade or breakdown
c. develop as many pesticides as possible
d. all of the above

1.3 Pesticides must be registered with the United States:
a. USDA
b. NCDA&CS
c. RTTP
d. EPA

1.4 Every pesticide label shall bear on the front panel the statement:
a. hot stuff—do not touch
b. keep out of reach of children
c. keep out of harms way
d. use in a manner inconsistent with the labeling

1.5 To register a pesticide with the US EPA, the manufacturer must:
a. show that the pesticide will have a minimum impact on the environment if the label is followed.
b. furnish all experimental data to support its use
c. prove that it can control pests listed on its label
d. all the above

TEST YOUR UNDERSTANDING

FILL-IN THE BLANK.

Complete each statement with the appropriate word(s):

1.6 _____ is the most important factor in pesticide research and development.

1.7 Pesticide registration means the pesticide may be legally _____ and _____ in the United States.

1.8 The hazard of a pesticide depends on both the _____ and the _____ received from the pesticide.

1.9 Label _____ is the key to ensuring a better understanding of pesticides.

1.10 The potential for a pesticide to cause harm to humans is called _____.

1.11 In case of an accident or overexposure, the label identifies the pesticide's _____ _____ so medical personnel can provide immediate and proper treatment.

1.12 Regardless of the complexity of the label, it is your responsibility to _____ and _____ the label.

1.13 As a new employee in the structural pest control industry, you should develop the habit of reading the label **before:**

1) _____

2) _____

3) _____

1.14 One of the major ways pesticides can enter the body to possibly cause harm is through the _____.

1.15 "It is a violation of Federal law to use this product in a manner inconsistent with its labeling". What does this statement mean to you?

_____

_____

_____

_____

TEST YOUR UNDERSTANDING

TRUE OR FALSE

Read each question. Decide if the statement is true (**T**) or false (**F**). Circle your answer.

1.16 Pesticides control pests.
T F

1.17 Pesticides can be broken down by microorganisms and other environmental factors.
T F

1.18 Pesticides that are slightly toxic will not harm you.
T F

1.19 Pesticide exposure can be prevented by wearing PPE.
T F

1.20 Label comprehension is the key to ensuring a better understanding of pesticides.
T F

Upon completion of each unit in the **Registered Technician Introductory Training Workbook**, the unit must be signed and dated by the designated trainer and the registered technician trainee.

When all units of the **Registered Technician Introductory Training Workbook** are completed by the registered technician trainee, the signature of the licensee at the end of Unit 8 will verify successful completion of the **Workbook**.

_____	_____
Registered Technician Trainee	**Date**
_____	_____
Designated Trainer	**Date**

NOTES:

TERMS TO KNOW

Active Ingredient	Active ingredient, abbreviated "a.i.", is the material in a pesticide formulation that actually controls (prevents, destroys, repels) the target pest.
Insecticide	A pesticide used for the control of insects. Some insecticides are also labeled for control of ticks, mites, spiders, and other insect-like organisms.
Formulation	A mixture of active and inert ingredient(s) combined during manufacture. The inert ingredients are added to improve the mixing and handling qualities of the pesticide.

Every pesticide manufacturer has a **brand (trade) name** for its product.

The brand name appears on the front panel of the label and is the one used in advertisements and by company salespersons. The brand name often indicates the type of **formulation**.

It is important to note that different brand names are used by different manufacturers, even though the products contain the same **active ingredient**.

For example, **permethrin insecticide,** an active ingredient commonly used in structural pest control pesticides, is manufactured by several companies and is advertised under the following brand names. Table 2.1 lists some of the brand names used by several of these manufacturers.

Table 2.1

MANUFACTURER	BRAND NAME	ACTIVE INGREDIENT
AgroEvo	**Permanone**	permethrin
American Cyanamid	**Outflank**	permethrin
FMC	**Dragnet, Flee, Pounce**	permethrin
Point Enterprise	**Excel, Point**	permethrin
Zeneca	**Prelude**	permethrin

Always check the active ingredient(s) when comparing pesticides. Many different pesticides contain the same active ingredient. Purchasing a pesticide based on the active ingredient it contains does not always ensure you are getting the right pesticide. You must also read the directions to be sure the pest and site of application are on the label.

When comparing two different products containing the same active ingredient, be sure to also compare the amount of active ingredient in each product. Often products will contain the same active ingredient, but in different concentrations. Make comparisons based on use rates that contain the same amount of active ingredient.

Often manufacturers use a similar brand name, but with very slight variations in their label to designate that it is a different pesticide.

PESTICIDE APPLICATORS MUST BE CAREFUL ABOUT CHOOSING A PESTICIDE BY BRAND NAME ALONE!

For example, the three pesticide products listed below contain the active ingredient **chlorpyrifos**. These products are distributed by **Dow AgroSciences** under the brand names **Dursban 50W, Dursban TC,** and **Dursban Pro.**

Though each of these products appear to be similar, each is a different formulation with different concentrations of chlorpyrifos active ingredient in the product. Further, each of the **Dursban** labels designates *very different* uses of the product. While one label permits the use of that product indoors for the control of fleas, the other labels do not permit such use. There are numerous other differences in these products which make careful comparison of the product labels necessary before deciding which product to use.

Brand name: Dursban 50W **Common name: chlorpyrifos** **Active ingredient: 50%**	**Brand name: Dursban TC** **Common name : chlorpyrifos** **Active ingredient: 44.0%**	**Brand name: Dursban Pro** **Common name: chlorpyrifos** **Active ingredient: 23.5%**

The pesticide label is your primary source of information to help you decide whether the pesticide you have selected is the proper pesticide. When choosing among different brand names of the same pesticide, check each active ingredient (and its amount), the type of formulation, and where the pesticide may be applied to ensure it is the least hazardous and most effective pesticide for the job.

An excellent reference to help you decide the proper pesticide to use is the *"North Carolina Agricultural Chemicals Manual"*. The manual is prepared by the College of Agriculture and Life Sciences, North Carolina State University.

This manual is revised and published annually to provide extension, researchers, and other professional workers, dealers, applicators, distributors, formulators, and manufacturers with the most up-to-date information available on the selection, application, and safe and proper use of agricultural and structural pest control pesticides.

Copies of the manual are available by contacting:

Agricultural Chemicals Manual
North Carolina State University
Campus Box 7603
Raleigh, NC 27695-7603

TEST YOUR UNDERSTANDING

MULTIPLE CHOICE

To answer questions **2.1- 2.3**, refer to the **Dursban Pro, Dursban TC, and Dursban 50W** labels included with this unit.
Select the **best** answer of the 4 choices provided:

2.1 What do **Dursban Pro, Dursban TC, and Dursban 50WP** pesticides have in common?
- a. the amount of the active ingredient is the same
- b. they contain the same active ingredient
- c. the active ingredient is different
- d. the formulation is the same

2.2 How many of the **Dursban** labels has a US EPA registration number?
- a. 0
- b. 1
- c. 2
- d. 3

2.3 **Dursban TC, Dursban Pro and Dursban 50W** are :
- a. insecticides
- b. fungicides
- c. rodenticides
- d. herbicides

2.4 What statement below is true for the pesticides **Pounce and Prelude**? (see **Table 2.1**)
- a. the brand names are different
- b. the active ingredient is different
- c. the active ingredient is the same
- d. both a. and c.

2.5 The name used by pesticide manufacturers to advertise their product is called the:
- a chemical name
- b. common name
- c. brand name
- d. ingredient name

FILL-IN THE BLANK.

Complete each statement with the appropriate word(s):

2.6 The material in a pesticide formulation that actually controls (prevents, destroys, repels) the pest is the _____ _____.

2.7 Every pesticide manufacturer has a _____ name for its product.

2.8 It is important to check the _____ ingredient(s) when comparing pesticides.

2.9 Inert ingredients are added to improve the _____ and handling qualities of the pesticide

2.10 An example of an insecticide active ingredient is _____.

TRUE OR FALSE.

Read each statement. Decide whether the statement is true (**T**) or false (**F**) Circle your answer.

2.11 Two pesticides containing the same active ingredient will always have similar directions for use indoors.

T F

2.12 **Dursban 50W** contains 100% active ingredient

T F

2.13 Some insecticides labeled for insects also control of ticks, mites, spiders, and other insect-like organisms.

T F

2.14 Pesticides may contain the same active ingredient but in different concentrations.

T F

2.15 Permethrin is a pesticide and an insecticide.

T F

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_____	_____
Registered Technician Trainee	**Date**
_____	_____
Designated Trainer	**Date**

Specimen Label

Dow AgroSciences

Dursban* TC

Specialty Termiticide Concentrate

*Trademark of Dow AgroSciences LLC

For use by individuals/firms licensed or registered by the state to apply termiticide products. States may have more restrictive requirements regarding qualifications of persons using this product. Consult the structural pest control regulatory agency of your state prior to use of this product.

Active ingredient:
chlorpyrifos: O,O-diethyl O-(3,5,6-trichloro-2 pyridinyl) phosphorothioate 44.0%
Inert Ingredients 56.0%
Total Ingredients 100.0%

Contains 4 pounds of chlorpyrifos per gallon.

EPA Reg. No. 62719-47

Keep Out of Reach of Children

WARNING AVISO

Precaution al usuario: Si usted no lee ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

Precautionary Statements

Hazards to Humans and Domestic Animals

Precaution al usuario: Si usted no lee ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

May Be Fatal If Swallowed Excessive Absorption Through Skin May Be Fatal • Causes Substantial But Temporary Eye Injury • May Cause Skin Irritation.

Do not get in eyes, on skin or clothing. Avoid breathing vapors and spray mist. Handle concentrate in a ventilated area. Wash thoroughly with soap and water after handling and before eating or smoking. Remove contaminated clothing and wash before reuse. Keep away from food, feedstuffs and water supplies.

Personal Protective Equipment (PPE)

Mixers and loaders must wear a minimum of long-sleeved shirt and long pants, chemical-resistant footwear, chemical-resistant gloves, and protective eyewear (goggles, a faceshield, or safety glasses with front, brow, and temple protection. **Mixers and loaders** who do not use a mechanical system (such as the Voyager* container or in-line injector) to transfer the contents of this container must wear coveralls or chemical-resistant apron in addition to other required PPE.

Pesticide applicators must wear long-sleeved shirt and long pants, socks, shoes, and chemical-resistant gloves.

In addition, all pesticide handlers must wear a respiratory protection device (MSHA/NIOSH approved number TC-21C) and protective eyewear when working in a non-ventilated space and all pesticide applicators must wear protective eyewear when applying termiticide by rodding or sub-slab injection.

First Aid

If swallowed: Call a physician or Poison Control Center immediately. Do not induce vomiting. Contains an aromatic petroleum solvent. Do not give anything by mouth to an unconscious person.
If on skin: Immediately wash with plenty of soap and water. Get medical attention.
If in eyes: Flush with plenty of water for 15 minutes. Get medical attention.
If inhaled: Remove to fresh air if symptoms of cholinesterase inhibition appear and get medical attention immediately.
Note to physician: Chlorpyrifos is a cholinesterase inhibitor. Treat symptomatically. If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). Atropine, only by injection, is the preferable antidote. Oximes, such as 2-PAM/protopam, may be therapeutic if used early; however, use only in conjunction with atropine. In case of severe acute poisoning, use antidote immediately after establishing an open airway and respiration.

Environmental Hazards

This pesticide is toxic to birds and wildlife, and extremely toxic to fish and aquatic organisms. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent aquatic sites. Cover or incorporate spills. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters.

Physical or Chemical Hazards

Do not use or store near heat or open flame.

Notice: Read the entire label. Use only according to label directions.
Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" elsewhere on this label.

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at www.dowagro.com.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
Read all Directions for Use carefully before applying.

Specimen Label

DowElanco

Dursban* Pro

Specialty Insecticide

*Trademark of DowElanco

To be applied only by or under the supervision of commercial applicators responsible for pest control programs

For control of various pests in and around residential and nonresidential buildings and structures, on various modes of transport, and on turf, ornamental plants, or fruit, nut, and citrus trees not grown for sale or commercial production.

Active Ingredient:
chlorpyrifos: 0,0-diethyl 0-(3,5,6-trichloro-2-pyridinyl) phosphorothioate. 23.5%
Inert Ingredients. 76.5%
Total. 100.0%

Contains 2.0 pounds of chiorpyrifos per gallon.

EPA Reg. No. 62719-166

Precautionary Statements

Hazards to Humans and Domestic Animals

Keep Out of Reach of Children

CAUTION PRECAUTION

Precaution al usuario: Si usted no lee ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

Harmful If Swallowed, Inhaled, Or Absorbed Through Skin

Avoid contact with eyes, skin or clothing. Avoid breathing vapors or spray mist. Wear eye protection. Handle concentrate in a ventilated area. Wear protective clothing when using or handling this product to help reduce exposure to eyes and skin. As a minimum, chemically resistant gloves and footwear, a long-sleeved shirt and long-legged pants or coveralls are recommended. Keep away from food, feedstuffs and water supplies. Wash thoroughly with soap and water after handling and before eating or smoking. Remove contaminated clothing and wash before reuse.

First Aid

If swallowed: Call a physician or Poison Control Center immediately. Do not induce vomiting. Do not put anything into the mouth of an unconscious person.
If on skin: Wash exposed area with plenty of soap and water. Get medical attention.
If in eyes: Flush eyes with plenty of water for 15 minutes. Get medical attention.
If inhaled: Remove person to fresh air and if not breathing give artificial respiration, preferably by mouth to mouth. Get medical attention.
Note to physician: Chlorpyrifos is a cholinesterase inhibitor. Treat symptomatically. If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). Atropine, only by injection, is the preferable antidote. Oximes, such as 2-PAM/protopam, may be therapeutic if used early; however, use only in conjunction with atropine. In case of severe acute poisoning, use antidote immediately after establishing an open airway and respiration.

Environmental Hazards

This pesticide is toxic to birds and wildlife and extremely toxic to fish and aquatic organisms. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent aquatic sites. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters. Cover or contain spills outdoors and dispose of in a manner consistent with local, state, and federal regulations.

Notice: Read the entire label. Use only according to label directions.
Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" elsewhere on this label.

In case of emergency endangering health or the environment involving this product, call collect 517-636-4400.
Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
Read all Directions for Use carefully before applying.

Do not formulate this product into other end-use products.

Not for use on plants grown for sale or other commercial use, or for commercial seed production, or for research purposes. For use on plants intended for aesthetic purposes or climatic modification and being grown in interior plantscapes, ornamental gardens or parks, or on golf courses or lawns and grounds.

Storage and Disposal

Do not contaminate water, food or feed by storage or disposal.
Storage: Store in original container in secured dry storage area. Prevent cross-contamination with other pesticides or fertilizers. Do not store above 122°F for extended periods of time. Preferred storage is above 32°F. Storage below 32°F may result in solidification. If warmed to above 32°F, product will return to original form. Freezing does not adversely affect this product. If container is damaged or spill occurs, use product immediately or dispose of product and damaged container as indicated below.
Storage for Dilutions: Dilutions of Dursban Pro are sensitive to crystal formations when exposed to freezing, or near freezing temperatures, e.g. temperatures below 35°F, for extended periods of time. Therefore, dilutions allowed to stand overnight should be stored at temperatures above 4°F.
Pesticide Disposal: Excess pesticide resulting from the use of this product may be disposed of on site according to label directions or at an approved waste disposal facility.
Container Disposal: Do not reuse empty container. Triple rinse, wrap container and put in trash.

Specimen Label

DowElanco

Dursban* 50W

In Water Soluble Packets

Specialty Insecticide

*Trademark of DowElanco

To be applied only by or under the direct supervision of trained applicators responsible for insect control programs.

Active Ingredient:
chiorpyrifos: O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl) phosphorothioate 50%
Inert Ingredients 50%
Total 100%

EPA Reg. No. 62719-72

Precautionary Statements

Hazards to Humans and Domestic Animals

Keep Out of Reach of Children

WARNING **AVISO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

May Be Fatal If Swallowed • Harmful If Inhaled Or Absorbed Through Skin • Causes Eye Irritation

Do not get in eyes, on skin, or clothing. Avoid breathing dust and spray mist. Keep away from food, feedstuffs, and water supplies.

Personal Protective Equipment (PPE)

WPS Uses: Applicators and other handlers who handle this pesticide for any use covered by the Worker Protection Standard (40 CFR Part 170) - in general, agricultural-plant uses are covered - must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks
- Chemical-resistant headgear for overhead exposure

Non-WPS Uses: Applicators and other handlers who handle this pesticide for any use NOT covered by the Worker Protection Standard (40 CFR Part 170) -in general, only agricultural-plant uses are covered by the WPS - must wear:
When exposure to spray mist is likely to occur, protective equipment and clothing:

- Long-sleeved shirt and long pants
- Eye protection
- Waterproof gloves
- To prevent breathing of spray mist during application in confined areas, wear a respirator and cartridge(s) approved by MSHA/NIOSH for pesticides (approval number prefix TC-21C)

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing, As soon as possible, wash thoroughly and change into clean clothing.

First Aid

Organophosphate

If swallowed: Call a physician or Poison Control Center immediately. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person.
If on skin: Wash with plenty of soap and water. Get medical attention.
If in eyes: Flush with plenty of water for 5 minutes. Get medical attention if irritation persists.
If inhaled: Remove to fresh air if symptoms of cholinesterase inhibition appear and get medical attention immediately,
Note to physician: Chlorpyrifos is a cholinesterase inhibitor. Treat symptomatically. If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). Atropine, only by injection, is the preferable antidote. Oximes, such as 2-PAM/protopam, maybe therapeutic if used early; however, use only in conjunction with atropine. In case of severe acute poisoning, use antidote immediately after establishing an open airway and respiration.

Environmental Hazards

This pesticide is toxic to birds and wildlife, and extremely toxic to fish and aquatic organisms. Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent aquatic sites. Cover or incorporate spills, Do not contaminate water when disposing of equipment washwaters. This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area.

Notice: Read the entire label. Use only according to label directions. **Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" elsewhere on this label.**

In case of emergency endangering health or the environment involving this product, call collect 517-63&4400.
Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
Read all Directions for Use carefully before applying.

Do not apply this product through any type of irrigation system.

NOTES:

TERMS TO KNOW

Botanical Pesticide A pesticide produced from naturally occurring chemicals found in some plants. Examples are nicotine, pyrethrum, and rotenone.

Carbamate Insecticide One of a class of insecticides derived from carbamic acid.

Chemical Name The scientific name of the active ingredient found in the formulated product. The name is derived from the chemical structure of the active ingredient.

Common Name A common chemical name given to a pesticide by a recognized committee on pesticide nomenclature. Many pesticides are known by a number of trade or brand names but have only one recognized common name.

Environment Everything that is around us. It includes the air, soil, water, plants, animals, houses, office building, factories and all that they contain.

Inorganic A compound lacking carbon in its structure. Sometimes called "minerals" because they are generally mined from earthen deposits before being refined and formulated for use.

Insecticide A pesticide used for the control of insects. Some insecticides are also labeled for control of ticks, mites, spiders, and other arthropods.

Organophosphate A class of insecticides derived from phosphoric acid esters.

Persistent The quality of an insecticide to remain as an effective residue.

Pyrethroid A synthetic (man-made) pesticide that mimics pyrethrin, a botanical pesticide derived from certain species of chrysanthemum flowers.

Resistance The measurable decrease in the effectiveness of a pesticide as a result of previous exposure(s) of a pest population to that pesticide or related types.

Vertebrate(s) Animals that have an internal skeleton and segmented spine, such as fish, birds, reptiles, and mammals. Insects have an exoskeleton (the hard covering on the outside of their bodies) with no internal skeleton.

Common Name

All pesticides have a **chemical name**. These names are usually long and complex. Because of this, many pesticides, but not all, have been assigned a shorter **common name**. Only common names approved by the EPA may be used in the ingredient statement on the pesticide label. Table 3.1 illustrates the common and chemical names of several pesticides common to the structural pest control industry.

Table 3.1 EXAMPLES OF PESTICIDES WITH COMMON NAMES

BRAND NAME	COMMON NAME	CHEMICAL NAME
Baygon 70WP insecticide	propoxur	2-(1-methylethoxy)phenyl methylcarbamate
DursbanTC insecticide	chlorpyrifos	0,0-diethyl 0-(3,5,6-trichloro-2-pyridinyl) phosphorothioate
Ficam D insecticide	bendiocarb	2,2-dimethyl-1,3-benzodioxol-4-yl methylcarbamate
Knox-Out 2FM insecticide	diazinon	0,0,-diethyl 0[6-methyl-2-(1-methylethyl)-4-pyrimidinyl] phosphorothioate
Orthene 75SP insecticide	acephate	0,S-dimethyl acetylphosphoramidothioate
Sevin 50WP insecticide	carbaryl	1-naphthyl methylcarbamate
Vengeance AquaBlok rodenticide	bromethalin	N-methyl-2,4-dinitro-N-(2,4,6-tribromophenyl)-6-(triflurormethyl)benzenamine

Chemical Name

Every pesticide label must list the product's active ingredient by its chemical name. The chemical name is the complex name on a pesticide label that identifies the chemical components and structure of the pesticide.

For example, the chemical name of the active ingredient in **FICAM D insecticide**, shown in Figure 3.1, is *2,2-dimethyl-1,3-benzodioxol-4-yl methylcarbamate.* The common name for this active ingredient is bendiocarb.

To comply with **Structural Pest Control Rules & Regulations**, you are required to keep a record of each pesticide applied. All pesticide treatment records must include the **entire** brand name of the pesticide.

Acceptable documentation: Tempo 2 EC

Unacceptable documentation: Tempo

As mentioned above, the chemical name describes a unique chemical structure for that particular pesticide. In general, pesticides with similar chemical structures are placed in classes based on some aspect of their chemical make-up. Pesticides grouped within a class exhibit similar chemical characteristics.

In your work as a structural pest control technician, you will use many different pesticides to control pests. In structural pest management, the most important objective is to:

Control Pests While Minimizing Hazards to the Environment.

Until you become a **Registered Technician**, most of the decisions regarding the selection of a pesticide will be the responsibility of your company's supervisor or licensee.

Pesticide Classes

Once you have become a registered technician, the single-most important decision that you will ultimately make is to choose the **right** pesticide for your particular pest control situation. This requires a basic understanding of the different classes of pesticides. Pesticide classification often reveals properties of a pesticide which will be important for you to know, such as how **persistent** a pesticide is in the **environment** or the potential of a pesticide to cause harm to you and other organisms.

The major groups of insecticide active ingredients (see Table 3.2) used in structural pest control can be categorized as follows:

- **BOTANICALS -** Botanically-derived insecticides have gained favor in recent years, due in part to the perception that they are more safe or "natural" because they originate from plant material. However, it is important to be aware that they are pesticides, and that they fall under the same state and federal regulations as synthetic pesticides. All pesticides must be labeled for the specific pest(s) on the particular crop(s) or site(s) for their use to be legal. If the use is not stated on the label, then the pesticide is not legal to apply.

Botanicals were first discovered many centuries ago when certain varieties of chrysanthemum flowers were found to have insecticidal properties when dried and crushed into a dust or powder. **Pyrethrum** is the most widely used botanical insecticide in structural pest management. **Pyrethrum** has very low toxicity to humans, however, it is quite toxic to most fish, birds, reptiles, and amphibians.

- **CHLORINATED HYDROCARBONS** - most chlorinated hydrocarbon insecticides are no longer used in the United States. This class of insecticides was alleged to cause adverse effects on people and the environment. **Lindane** insecticide is a chlorinated hydrocarbon that is occasionally used by structural pest control operators to control wood-destroying beetles.

- **ORGANOPHOSPHATES** - the **organophosphates** were the first insecticides to replace the chlorinated hydrocarbons, such as DDT and chlordane. Organophosphates, also called OP's, were developed in the early 1950's and some are highly toxic to mammals. **Methyl parathion**, an agricultural insecticide and an OP, is still available for use **only** in this marketplace. However, the insecticidal properties and relatively lower toxicity to humans and animals of other OP's, such as **diazinon**, **chlorpyrifos**, **acephate** and **propetamphos** have allowed these materials to be used

extensively in structural pest control. Most OP's break down readily in the environment and do not pose the problem of long-term **persistence** as the chlorinated hydrocarbons. The primary toxic action (mode of action) of organophosphates to humans and animals involves inhibition of an important nervous system enzyme, called cholinesterase.

Cholinesterase controls the "communication" of nerve impulses between nerve cells. Exposure to OP's inhibits the release of this enzyme which may cause "messages" between nerve cells to be disrupted, leading to muscle failure.

It is important to note that pets, such as dogs and cats, have cholinesterase in their nervous systems! Be especially careful when applying pesticides near pets as they too could be harmed.

- **CARBAMATES** - **carbamate** insecticides work in much the same way as the organophosphates. As with organophosphates, carbamates are cholinesterase inhibitors. Generally, the carbamates have even lower toxicity to humans and animals than most organophosphates.

- **INORGANICS** - this class of insecticides is one of the oldest insecticides used in structural pest management today. They are mined from naturally occurring deposits of borax or the fossilized silica-shell remains of algae. **Inorganics** are slow acting insecticides that provide a long residual action against a variety of structural pests. Most inorganics control pests by destroying the waxy layers of the insect's skin tissue (cuticle) and causing death by desiccation (excessive drying of tissue).

- **PYRETHROIDS** - **pyrethroids** are synthesized from the insecticidally active compounds found in pyrethrum, called pyrethrins. Pyrethroids generally have some form of improved insecticidal activity, often increased residual, when compared to natural pyrethrins. Blockage of nerve impulse transmission which leads to paralysis (pest knockdown) and eventual death is the primary mode of action for pyrethroids.

- **BIORATIONALS** - biorationals are pest-specific pesticides of natural origin (or synthetic versions of natural chemicals) that have a minimal or no adverse impact on non-target species or the environment.

- **INSECT GROWTH REGULATORS (IGR'S)** - IGR's are a group of compounds that can disrupt a number of normal processes, such as molting, in the growth and development of insects. They generally have very little toxicity to humans, animals, and other **vertebrates**.

Once insects hatch from eggs, they grow in a series of definite stages. The growth of an insect in each stage is limited by its exoskeleton. As the insect develops, it forms a new skeleton directly beneath the old one. The old skeleton splits and the next insect stage emerges and expands to a larger size before the skeleton hardens. This process of growth is called MOLTING. The number of times an insect molts ranges from four to twenty or more.

Table 3.2

PESTICIDE CHEMICAL CLASSES AND EXAMPLES OF REPRESENTATIVE PESTICIDES						
BOTANICALS	CARBAMATES	INORGANIC	ORGANOPHOSPHATES	PYRETHROIDS	BIORATIONALS	INSECT GROWTH REGULATORS (IGR'S)
pyrethrum	bendiocarb	boric acid	acephate	cyfluthrin	abamectin	fenyoxycarb
pyrethrins	carbaryl	diatomaceous earth	chlorpyrifos	cypermethrin	*metarhizium anisopliae*	hydroprene
d-limonene	propuxur	silica aerogel	diazinon	deltamethrin		methoprene
			malathion	fenvalerate	pyriproxyfen	
			propetamphos	permethrin		
				resmethrin		

Types of Pesticides

As discussed earlier, pesticides can be classified by their chemical structure or their source. There is another common way of classifying pesticides. On the front of the pesticide label is a statement which indicates, in general terms, what pest(s) the product is intended to control. Remember that the term *pesticide* is a broad term under which other specific-use pesticides are included.

Pests can be insects, mice, rodents and other animals, fungi, microorganisms like bacteria and viruses, or unwanted plants (weeds). Though often misunderstood to refer only to insecticides, the term pesticide also applies to herbicides, fungicides, and various other substances used to control pests.

Many household products are pesticides. Did you know that all of these common products are considered pesticides?

- Cockroach sprays and baits
- Insect repellents for personal use.
- Rat and other rodent poisons.
- Flea and tick sprays, powders, and pet collars.
- Kitchen, laundry, and bath disinfectants and sanitizers (such as **Clorox**®).
- Products that kill mold and mildew.
- Some lawn and garden products, such as weed killers.
- Some swimming pool chemicals.

By their very nature, most pesticides create some risk of harm to humans, animals, or the environment because they are designed to kill or otherwise adversely affect living organisms.

At the same time, pesticides are useful to the environment because of their ability to kill potential disease-causing organisms and control insects, weeds, and other pests. Biologically-based pesticides, such as pheromones and microbial pesticides, are becoming increasingly popular and often are less hazardous than traditional chemical pesticides.

Table 3.3 lists some common kinds of pesticides and their function.

Table 3.3

PESTICIDE	FUNCTION
Algicides	Control algae in lakes, canals, swimming pools, water tanks, and other sites.
Antimicrobials	Kill microorganisms (such as bacteria and viruses).
Attractants	Attract pests (for example, to lure an insect or rodent to a trap).
Biocides	Kill microorganisms.
Disinfectants and sanitizers objects.	Kill or inactivate disease-producing microorganisms on inanimate
Fungicides	Kill fungi (including blights, mildews, molds, and rusts).
Fumigants	Produce gas or vapor intended to destroy pests in buildings or soil.
Herbicides	Kill weeds and other plants that grow where they are not wanted.
Insecticides	Kill insects and other arthropods.
Insect growth regulators	Disrupt the molting, maturity from pupal stage to adult, or other life processes of insects.
Miticides (acaricides)	Kill mites that feed on plants and animals.
Microbial pesticides	Microorganisms that kill, inhibit, or out-compete pests, including insects or other microorganisms.
Molluscicides	Kill snails and slugs.
Nematicides	Kill nematodes (microscopic, worm-like organisms that feed on plant roots).
Ovicides	Kill eggs of insects and mites.
Pheromones	Biochemicals used to disrupt the mating behavior of insects
Repellents	Repel pests, including insects (such as mosquitoes) and birds.
Rodenticides	Control mice and other rodents.

A Pheromone is a chemical produced by an animal or insect to attract other animals or insects of the same species.

What about structural pest control devices? The EPA also has a role in regulating devices used to control pests. More specifically, a "device" is any instrument or contrivance (other than a firearm) intended for trapping, destroying, repelling, or mitigating any pest. A mousetrap is an example of a device. Unlike pesticides, EPA does not require devices to be registered with the Agency.

Pesticide Failures

The pesticide storage area of your company contains many pesticides for the control of a variety of structural pests. The reason for this is that rarely does any one single pesticide kill all the pests encountered in your work.

Sometimes, however, even with this broad assortment of pesticides to choose from, a pesticide may fail to control a pest. When faced with this possibility, simply picking the next pesticide available on the storage shelf may not provide a solution to the problem until you can determine the reason for the failure.

There are several possible reasons for failure of a pesticide to work as anticipated:

. . . did you apply the correct dosage as directed on the label?

. . . was the pest properly identified?

. . . was the pesticide applied at the appropriate time as recommended on the label?

When selecting a pesticide, an important **long-term** consideration is that some pests have developed significant levels of **resistance**[1] to particular pesticides. When a pesticide is used repeatedly in the same place, against the same pest, the opportunity for resistance to that pesticide and to other pesticides in the same class becomes greater.

To reduce the likelihood of pesticide resistance developing, you should acquire the habit of "rotating" pesticides. Rotating pesticides means using a pesticide from a different insecticide class, such as a change to a pyrethroid insecticide if resistance to carbamate insecticides is suspected.

Resistance develops most frequently and rapidly in insects, especially in those that have high rates of reproduction and short life cycles and are not able to move rapidly from one locality to another. Resistance does not develop in all pests nor in all places where a particular pest is found. In certain insects, it may take years or many insect generations before resistance develops. It usually appears first in local situations and then becomes common throughout the geographical range of the pest.

[1] resistance is the ability of a pest to tolerate exposure to a specified amount of a pesticide. Not all pests in a population may be killed by a pesticide, even though all may have picked up or acquired the same amount of pesticide. The few that survive have a greater natural tolerance and form the breeding stock of the next generation. Resistance develops most quickly in pests which reproduce rapidly, such as flies and some cockroaches.

WORKBOOK EXERCISES

Completing the following exercises will help develop a greater awareness of the different classes and types of pesticides in your storage area. Carefully review the contents of your pesticide storage area. Select 5 pesticides which have **different active ingredients**. It may be a good idea to have your trainer present to assist you with this exercise.

Enter the following information regarding each pesticide in the table below:

1) the brand name of the pesticide,
2) the pesticide class or group represented by the pesticide and,
3) two (2) pests controlled by the pesticide.

BRAND NAME	CLASS OF INSECTICIDE	PESTS CONTROLLED
EXAMPLE: Saga WP	pyrethroid	ants and cockroaches
1)		
2)		
3)		
4)		
5)		

On the front of the pesticide label is a statement which indicates, in general terms, what the product is intended to control. It is important to remember that the term *pesticide* is a broad term under which other specific-use pesticides are included.

As a review, an **insecticide** is a pesticide used to control insects, **rodenticides** control rodents, **acaricides** control mites (*Acarina* is an order of mites, hence, the name acaricide), **termiticides** control termites and **fungicides** control fungi (such as wood-decaying fungi).

Below is a list of several common types of pesticides. Provide one or two brand names for each type of pesticide that you may use in your work as a registered technician. Include brand names for household pest control products and for wood-destroying organism pesticides.

INSECTICIDE _____

FUNGICIDE _____

RODENTICIDE _____

ACARICIDE _____

AVICIDE (for bird control) _____

INSECT GROWTH REGULATORS _____

REPELLENTS _____

PHEROMONES _____

DESICCANTS _____

TEST YOUR UNDERSTANDING

MULTIPLE CHOICE

Select the best answer of the 4 choices provided:

3.1 Chemical names on pesticide labels are:
- a. in larger print than trade names
- b. the same as trade names
- c. long and complex
- d. short and simple

3.2 Pesticides with different brand names but the same common names will have:
- a. similar trade names
- b. the same active ingredient
- c. the same inert ingredient
- d. the same amount of active ingredient

3.3 A pesticide classified as "persistent" would:
- a. break down very rapidly
- b. never break down
- c. break down slowly
- d. control all pests

3.4 All pesticides used in structural pest control have:
- a. a common name
- b. a trade name
- c. a chemical name
- d. both b. and c.

3.5 **Diazinon** insecticide will exhibit chemical properties that are similar to (refer to Table 3.2):
- a. cyfluthrin
- b. boric acid
- c. malathion
- d. pyrethrum

FILL-IN THE BLANK

Complete each statement with the appropriate word(s).

3.6 All registered pesticides have a _____ name.

3.7 To comply with **Structural Pest Control Rules & Regulations**, you are required to keep a record of each _____ applied.

3.8 The _____ name is the complex name on a pesticide label that identifies the chemical components and structure of the pesticide.

3.9 The single-most important decision that you will ultimately face is to determine the _____ pesticide for your particular pest control situation.

3.10 The_____ were the first insecticides to replace the chlorinated hydrocarbons.

3.11 _____ have even lower toxicity to mammals than most organophosphates.

3.12 Inorganics are slow killing insecticides that provide a long _____ action against a variety of structural pests.

3.13 Pyrethroids are synthesized from the insecticidally active compounds found in _____.

3.14 Pesticides grouped within classes will exhibit common _____.

3.15 **Pyrethrum** is the most widely used _____ insecticide in structural pest management.

TRUE OR FALSE.

Read each statement. Decide whether the statement is true (**T**) or false (**F**). Circle your answer.

3.16 When a pesticide is used repeatedly in the same place, against the same pest, the opportunity for resistance decreases.

T F

3.17 **Pyrethrum** is very toxic to humans.

T F

3.18 All pesticides have a common name.

T F

3.19 **Carbaryl** is a carbamate insecticide.

T F

3.20 Agricultural pesticides, such as **methyl parathion** insecticide, are also commonly used in structural pest control.

T F

3.21 Pheromones kill pests.

T F

3.22 Termiticides control cockroaches.

T F

3.23 Rodenticides control mice.

T F

3.24 All insecticides are pesticides.

T F

3.25 All pesticides are insecticides.

T F

Upon completion of each unit in the **Registered Technician Introductory Training Workbook**, the unit must be signed and dated by the designated trainer and the registered technician trainee.

When all units of the **Registered Technician Introductory Training Workbook** are completed by the registered technician trainee, the signature of the licensee at the end of Unit 8 will verify successful completion of the **Workbook**.

_____ _____

Registered Technician Trainee **Date**

_____ _____

Designated Trainer **Date**

NOTES:

TERMS TO KNOW

Active Ingredient	active ingredient, abbreviated "a.i.", is the material(s) in a pesticide formulation that actually controls (prevents, destroys, repels) the target pest.
Dilute	to make less concentrated.
Emulsifier	a chemical that aids in suspending one liquid in another.
Emulsion	a mixture in which one liquid is suspended as very small drops in another liquid, such as oil in water. As an example, when concentrated pesticide active ingredient is dissolved in an oil and then mixed with emulsifiers, they form emulsifiable concentrates. When emulsifiable concentrates are then mixed in water within a spray tank, they form an emulsion. Emulsions are typically milky-white in appearance.
Formulation	a mixture of active and inert ingredients(s) combined during manufacturing.
Hazard	the risk of harmful effects from a pesticide. Hazard depends on the particular toxicity of a pesticide and the length of exposure to that pesticide.
Inert Ingredient	materials in a pesticide formulation that are not the active ingredients. The inert ingredients are added to dilute the active ingredient(s) and improve the mixing and handling qualities of the pesticide. Inert ingredients may be hazardous.
Pesticide	chemical substances or preparations used to kill, control or manage pest populations.
Solution	a liquid that contains dissolved substances; (example, table salt dissolved in water).
Solvent	a liquid, such as water, kerosene, xylene, or alcohol, that will dissolve a substance to form a solution.
Suspension	a substance that contains undissolved particles mixed throughout a liquid; (example, ground pepper mixed with water).
Toxicity	the potential for a pesticide to cause harm to humans and animals.

What is a Formulation?

The term formulation refers to the character or form of the pesticide product. There are several different types of **pesticide formulations**; for example dust, granular, and emulsifiable concentrate, among others. Only those commonly used in structural pest control will be discussed in this **WORKBOOK**. Table 4.2 lists the formulations commonly used in structural pest control.

The purest form of a **pesticide** (technical grade) contains 100% **active ingredient**. In most cases, this material would be very difficult to mix or apply safely. The material would be very **toxic** and be extremely dangerous to the applicator! Because of the **hazards** involved in handling technical grade pesticides, these are not generally available to structural pest control pesticide applicators.

Pesticide manufacturers add substances to technical grade pesticides to improve handling, application, effectiveness, and storage, and to make the pesticide safer to use. A manufacturer mixes the active ingredient with one or more **inert** (non-pesticide) ingredients. This mixture of active and inert ingredients is known as a pesticide **formulation**. It may be ready-to-use as packaged or may require that you **dilute** it in a **solvent** (e.g. water) or other carrier.

Therefore, a formulation is a convenient form of a pesticide which allows the applicator to use it effectively and safely at a required concentration for a specific pest control purpose.

Different formulations require different methods of handling. The label will always indicate what type of formulation the product contains and how to use it properly.

Active Ingredient

FICAM D
1% DUST Insecticide

ACTIVE INGREDIENTS: bendiocarb (2,2-dimethyl-1,3-benzodioxol-4-yl methylcarbamate)	1.0%
INERT INGREDIENTS:	99.0%
TOTAL:	**100.0%**

Figure 4.1

Every pesticide label must list each active ingredient and show its concentration in a percentage by weight on the front panel of the label. The active ingredient (a.i.) is the chemical in a pesticide formulation which has a specific effect on a pest. Often, the kind of formulation is also listed.

Active ingredients in a pesticide can kill, repel, attract, or otherwise control the target pest.

While there are about 19,500 pesticides registered by the EPA for use in agriculture, forestry, industry and home and gardens, only **690** different active ingredients are used.

In Figure 4.1 **FICAM D** contains 1% by weight of the a.i. **bendiocarb** (bendiocarb is the **common name** of this pesticide). The **D** in the brand name indicates that the product is a dust formulation.

To determine the amount of active ingredient in a container holding 10 pounds of pesticide in this particular formulation, use the formula below.

1% a.i. (expressed as 0.01) x 10.0 lbs. (product weight) = 0.1 lbs FICAM insecticide per 10.0 pound bag

In this example, 0.1 pounds bendiocarb active ingredient are contained in the 10.0 container of **Ficam D** insecticide.

Liquid formulations, such as an **EC** (emulsifiable concentrate) often indicate the amount of a.i. in pounds per gallon of formulation. For example, a 4 **EC** would mean 4 lb. per gallon of a.i. in an emulsifiable formulation.

> The sum of the amount of active ingredients plus the amount of inert ingredients in a pesticide formulation, as a percentage of weight, always equal 100%!

WORKBOOK EXERCISE

Below are three pesticide formulations. Calculate the amount of active ingredients, or inert ingredient, in pounds, for each of the products.

FORMULATION	Weight of product (in pounds)	Active ingredient	Inert ingredient
FIRE ANT 2.5 G	100.0	2.5	? ____
DIAZINON 50 W	5.0	?_____	2.5
DURSBAN 1G	10.0	?_____	9.9

Inert Ingredients

As stated earlier, the other ingredients used to make a pesticide formulation are referred to as **inert ingredient**s. Inert ingredients (inactive ingredients) are the components of the formulation that generally do not have reported activity against pests. The inert liquid or solid material is added to an active ingredient by the manufacturer to prepare the pesticide formulation for use by the applicator. The inert ingredients are not usually named, but the label must show what percentage of the total contents they make up.

> Inert ingredients are used in a pesticide formulation to make the pesticide:
> - safer,
> - more effective,
> - easier to measure, mix, and apply,
> - more convenient to handle.

The term *"inert"* in inert ingredients is sometimes misleading. Although they are not intended by the pesticide manufacturer to kill pests, they are generally **not** harmless. They may exhibit potentially hazardous characteristics, such as flammability, if improperly stored near a source of heat, or **toxicity**, if accidentally swallowed or inhaled. Petroleum solvents, for example, are used in many pesticides. They are both highly flammable and toxic.

An example of an inert ingredient in a pesticide formulation is the coarse corn grit in some fire ant baits that serves as a carrier for the active ingredient.

Also important when discussing pesticide formulations is the fact that, while the active ingredients may be odorless; the inert ingredients may have odors. Compounds with a strong or offensive odor are sometimes added to the formulation by the manufacturer to serve as a warning agent. Generally, though, inert ingredients have no, or insignificant, pesticidal activity against pests.

Other Pesticide Ingredients

Pesticide manufacturers also commonly add materials to pesticide formulations to help increase the effectiveness. Most pesticide formulations contain at least some amount of these materials, called "adjuvants". Adjuvants change the spreading, dispersing, and wetting properties of spray droplets. While there are many different adjuvants available, it is unlikely that you will be required to use them with pesticides used in structural pest control.

Types of Formulations

Pesticide labels generally list the formulation type, such as wettable powder, dust, granules, bait, etc. Some manufacturer's spell-out the type of formulation completely, such as **WETTABLE POWDER**; others may abbreviate this information as **WP** or **W,** in the brand name of the pesticide. In Figure 4.1 **Ficam D** is the manufacturer's brand name of this pesticide with the active ingredient **bendiocarb**. **D** indicates that it is a dust formulation.

It is often possible to select from two or more formulations of the same pesticide to control a pest. If you find that more than one formulation is available for your pest control situation, you must choose the best one for the job.

For example, an emulsifiable concentrate insecticide usually provides a faster kill but will have a shorter residual action than a wettable powder. Emulsifiable concentrates may stain some surfaces or fabrics and may not be suitable for such surfaces. Wettable powders may leave a visible residue on smooth, dark surfaces such as tile or stained wood. Whenever a choice is available, consider the safety of the pesticide applicator, building occupants (including pets) and the surfaces or area to which the pesticide will be applied.

Before you choose, ask yourself several questions about each formulation:

- *Do you have the necessary application equipment?*
- *Can the formulation be applied safely under the conditions in the application area?*
- *Will the formulation reach your target and stay in place long enough to control the pest?*
- *Is the formulation likely to harm the surface to which you will apply it?*

To answer these kinds of questions, you need to know something about the characteristics of the different types of pesticide formulations and the general advantages and disadvantages of each type. Table 4.2 summarizes most of the important structural pesticide formulations and the characteristics of each type.

Why Are There Many Kinds of Pesticide Formulations —Why Not Just One?

There are three main reasons for this:

- A single active ingredient often is available as different formulations.
- The chemistry of the active ingredient itself dictates what formulations are possible. As an example, some active ingredients are water soluble and others are not; those not soluble in water are formulated in other solvents.
- Different formulations offer different advantages; for example, some formulations are less likely than others to cause harm/injury to the environment.

Figure 4.2—See Following Page

LIQUID FORMULATIONS		CHARACTERISTICS	PRO (+) / CONS (-)
Emulsifiable **C**oncentrates	**EC**	Contains a liquid active ingredient, one or more that allows the formulation to be mixed. Diluted with water and forms milky liquid (emulsion) when mixed.	+ easy to mix and apply + little agitation required — will not settle out + little or no visible residue on treated surfaces - easily absorbed through skin of humans and animals - solvents may cause sprayer rubber or plastic parts to deteriorate - phytotoxic (cause harm) to some plants.
Solutions	**S**	Soluble in water or oil. Forms clear liquid when mixed.	+ no agitation necessary - few products are available in structural pest control
Aerosols	**A**	These formulations contain one or more active ingredients and a solvent. Most aerosols contain a low percentage of active ingrediant. Aerosol formulations are usually small, self-contained units that release the pesticide when the nozzle is triggered.	+ ready to use + easily stored - practical for very limited uses - risk of inhalation injury - hazardous if punctured - difficult to confine to target site
Flowable **M**icroencapsulation	**FM/ME**	Active ingredient is in fine particles or encased in tiny plastic capsules which are suspended in other formulation ingredients and diluted in water for spraying.	+ easy to mix + very good residual activity + very low toxicity to humans and animals - constant agitation required - visible residues on some treated surfaces
Suspension **C**oncentrates	**SC**	as with FM's or ME's	0as with FM's or ME's
Ready-**t**o-**U**se finished sprays	**RTU**	Active ingredient is diluted to a finished spray and packaged as a pressurized aerosol or in a trigger sprayer.	+ no dilution necessary for use in the field - may be more expensive to purchase than concentrates
Ultra-**L**ow-**V**olume **U**ltra-**L**ow-**D**ose	**ULV** **ULD**	These pesticide concentrates may contain 100% active ingredient. They are designed to be used as is or to be diluted with small quantities of specified solvents, generally oils.	+ little or no agitation required + not abrasive to equipment + no plugging or screens and nozzles + little visible residue on treated surfaces - difficult to keep pesticide in the target site—high drift hazard - specialized equipment required - easily absorbed through skin of humans and animals

DRY FORMULATIONS		CHARACTERISTICS	PRO (+) / CONS (-)
Dusts	**D**	Active ingredient carried on dry particles, ie, clay or talc. Dusts may also contain 100% active ingredient.	+ ready to use — no mixing + excellent residual when kept dry - easy to over apply dusts - visible residues likely - sometimes difficult to confine dusts to target area - may irritate eyes, nose, throat and skin
Wettable **P**owders	**WP**	Usually contain 50% or more active ingredient. WP's do not dissolve in water — they form **suspensions**.	+ better residual on porous surfaces than EC's + lower phytotoxicity hazard than EC's + less skin and eye absorption than EC's - inhalation hazard to applicator while pouring and mixing the concentrated powder - requires constant agitation in the spray tank - residues may be visible
Soluble **P**owders	**SP**	Similar in appearance to WP's but SP's dissolve readily in water and form a true **solution**.	+ same as for wettable powders - inhalation hazard to applicator while pouring and mixing the concentrated powder
Baits	**B**	Active ingredient mixed with food or another substance. May be solid, liquid, or gel. The active ingredient in baits is usually less than 5%.	+ ready to use + long residual activity + entire area need not be treated as pest will generally go to the bait - some baits may pose hazards to children and nontarget placed in tamper-resistant containers
Granules	**G**	Granular particles are larger than dusts. Active ingredient carried by clay or ground nutshells. Active ingredient either coats or is absorbed into them. Active ingredient is usually between 1 and 15%.	+ ready to use — no mixing + low drift hazard + provide longer residuals than WP's or EC's - may need moisture to activate pesticidal action
GAS FORMULATIONS			
Fumigants	**F**	Fumigants are pesticides that form poisonous gases when released. Fumigants can be formulated as pressurized liquids, liquids that volatilize (change to a gas) when released, or solids that release gases when applied under high humidity conditions.	+ toxic to many insect and rodent pests + the gas can penetrate cracks, crevices, wood and other porous surfaces. + single applications will control most stages of pests - the application site must be enclosed or covered to prevent gas escape. - highly toxic to humans and all other organisms. - requires the use of specialized application detection and personal protective equipment. - fumigants provide no residual activity - **Applicators Must Be Certified or Licensed to Apply Fumigants**

WORKBOOK EXERCISES

Give an example of a brand name for each formulation listed below that your company may use.

FORMULATION	SYMBOL	BRAND NAME OF PESTICIDE
Aerosols	A	
Baits	B	
Dusts	D	
Emulsifiable **C**oncentrates	EC or E	
Flowable **M**icroencapsulation	FM / ME	
Fumigants	F	
Granules	G	
Soluble **P**owders	SP	
Solutions	S	
Suspension **C**oncentrates	SC	
Ultra-**L**ow-**V**olume concentrates	ULV	
Wettable **P**owders	WP	
Are there other formulations that you will use in your work? If so, include the pesticide formulation and its symbol below:		

TEST YOUR UNDERSTANDING

MULTIPLE CHOICE.

Select the **best** answer of the 4 choices provided.

4.1 A pesticide formulation:
a. is the total amount of active ingredient contained in the pesticide
b. cannot contain more than 50% active ingredient
c. consists of active and inert ingredients
d. is always diluted and ready-to-use

4.2 The formulation symbol for emulsifiable concentrate is:
a. E
b. CE
c. EC
d. Both a. and c.

4.3 Which of the following is a true statement regarding pesticides?
a. the brand name and chemical name will always be the same
b. most pesticides consist of nearly 100% technical material
c. most pesticides are diluted before use
d. pesticides produced by different manufacturers which contain the same active ongrediant will also have the same trade name.

4.4 Which dry pesticide formulation requires frequent agitation to remain in suspension?
a. a solution
b. an aerosol
c. a wettable powder
d. granules

4.5 A microencapsulated pesticide:
a. can be applied wet or dry
b. has a very short residual
c. contains an active ingredient surrounded by a plastic coating
d. is safe to touch, measure and mix without gloves

4.6 A pesticide formulation that contains 0.01 percent active ingredient is _____ than one which contains 0.1 percent active ingredient?
a. 10 times more concentrated
b. 100 times more concentrated
c. 10 times less concentrated
d. 100 times less concentrated

4-7 **Ficam D** is:
a. an insecticide
b. a dust formulation
c. a pesticide
d. all the above

FILL-IN THE BLANK

Complete each statement with the appropriate word(s).

4.8 Soluble powders mixed in water form a _____.

4.9 Pesticides are available in different forms called _____.

4.10 Every pesticide label must list each _____ _____and show its amount as a percentage by weight on the front panel of the label.

4.11 _____ is the risk of harmful effects from pesticides and will depend on the particular toxicity of a pesticide and the length of exposure to that pesticide.

4.12 The_____ _____ is the chemical in a pesticide formulation which has a specific effect on a pest.

4.13 A pesticide formulation consists of _____ and _____ ingredients.

4-14 Inert ingredients are used in a pesticide formulation to make the pesticide _____.

4.15 Ultra-low-volume concentrates may contain _____ % active ingredient.

4.16 WP's mixed in water form _____.

4.17 A pesticide formulation containing 55% active ingredient will also contain _____% inert ingredient.

TRUE or FALSE.

Read each statement. Decide whether the statement is true (**T**) or false (**F**). Circle your answer.

4.18 Inert ingredients in a pesticide formulation are always safe and harmless.

T F

4.19 Fungicides control fungi and wood-decaying organisms.

T F

4.20 Applicators must be certified or licensed to apply fumigants.

T F

4.21 A formulation is a convenient form of a pesticide which allows it to be used effectively and safely at a required concentration for a specific pest control purpose.

T F

4.22 Microencapsulated pesticides can be applied in a dry form without mixing in water.

T F

4.23 Aerosols contain a high percentage of active ingredient(s)

T F

4.24 A repellent is not considered a pesticide.

T F

4.25 All pesticide active ingredients are completely soluble in water.

T F

WORKBOOK EXERCISE

To complete this exercise, refer to the **Cynoff WSB** pesticide label included with this unit.

4.26 What is the common name of this product?

_____

4.27 What type of pesticide formulation is **Cynoff WSB**?

_____

4.28 How much active ingredient is contained in **Cynoff WSB**?

_____

4.29 What part of the **Cynoff WSB** product is water soluble?_____

4.30 How much formulation is contained in each water soluble bag of **Cynoff WSB**?_____

Upon completion of each unit in the **Registered Technician Introductory Training Workbook**, the unit must be signed and dated by the designated trainer and the registered technician trainee.

When all units of the **Registered Technician Introductory Training Workbook** are completed by the registered technician trainee, the signature of the licensee at the end of Unit 8 will verify successful completion of the **Workbook**.

_____	_____
Registered Technician Trainee	**Date**
_____	_____
Designated Trainer	**Date**

Code 1193 **Net Contents**

Cynoff®

WSB Insecticide

IN WATER SOLUBLE BAGS

Only for Sale to, Use and Storage by Professional Pest Control Operators.

EPA Reg. No. 279-3085 **EPA Est. 279-**

Active Ingredient:	**By Wt.**
*Cypermethrin**	35.6%
Inert ingredients	64.4%
	100.0%

*a(±)-cyano-(3-phenoxyphenyl)methyl (±)- *cis,trans* -3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate
** Cis/trans ratio: Max. 55% (±) cis and min. 45% (±) trans
U.S. Patent No. 4,024,163

KEEP OUT OF REACH OF CHILDREN

See Below for Additonal Precautionary Statements.

STATEMENT OF PRACTICAL TREATMENT

If Inhaled: Remove victim to fresh air. Apply artificial respiration if necessary.

If Swallowed: Drink 1 or 2 glasses of water and induce vomiting by touching the back of the throat with finger.

If in Eyes: Flush eyes with plenty of water. Obtain medical attention if irritation occurs and persists.

If on Skin: Wash with plenty of soap and water.

For Emergency Assistance Call: (800) 331-3148.

FMC®

FMC Corporation
Agricultural Products Group
Philadelphia PA 19103
11/96-C

PRECAUTIONARY STATEMENTS
Hazards to Humans (and Domestic Animals)

Warning
Harmful if swallowed or absorbed through the skin. Causes eye irritation. Do not get in eyes, on skin or on clothing. Avoid breathing vapor or spray mist. Wash thoroughly with soap and water after handling. May cause allergic skin reactions. Do not use in the edible product areas of food processing plants, restaurants, or other areas where food is commercially prepared or processed. Do not use in serving areas while food is exposed.

Environmental Hazards

This product is extremely toxic to fish. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters. Apply this product only as specified on this label. Care should be used when spraying to avoid fish and reptile pets.

Directions For Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Do not remove package from container except for immediate use.

STORAGE AND DISPOSAL

Pesticide Storage
Keep out of reach of children and animals. Store in original containers only. Store in a dry place and avoid excess heat. Do not store at temperatures below 32°F (0°C). Rough handling may cause breakage, especially at low temperatures. Allow to warm above 50°F (10°C) before use. Do not allow inner bag to become wet during storage. Do not handle inner bag with wet hands or wet gloves. Do not put concentrate or dilute material into food or drink containers. Do not contaminate other pesticides, fertilizers, water, food or feed by storage or disposal.

In case of spill, avoid contact, isolate area and keep out animals and unprotected persons. Confine spills. Call FMC (800) 331-3148.

To confine spill: If liquid, dike surrounding area or absorb with sand, cat litter or commercial clay. If dry material, cover to prevent dispersal. Place damaged package in a holding container. Identify contents.

Pesticide Disposal
Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Disposal
When all water soluble bags are used, the outer package should be clean and may be disposed of in a sanitary landfill, by incineration or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. If the outer container contacts formulated product in any way, it must be triple rinsed with clean water. Add rinsate to the spray tank and dispose of the outer package as described above.

GENERAL INSTRUCTIONS

Not for use on plants being grown for sale or other commercial use, or for commercial seed production, or for research purposes. For use on plants intended for aesthetic purposes or climatic modification and being grown in interior plantscapes, ornamental gardens or parks, or lawns and grounds.

For residual pest control in and on buildings and structures and their immediate surroundings and on modes of transport. Permitted areas of use include industrial buildings, houses, apartment buildings, greenhouses, buses, laboratories, and the nonfood/feed areas of stores, warehouses, vessels, railcars, trucks, trailers, aircraft (Do not use in aircraft cabins), schools, nursing homes, hospitals, restaurants, hotels, and food manufacturing, processing and servicing establishments.

The outer package contains an insecticidal wettable powder packaged in clear water soluble bags. Do not allow the inner bags to become wet before adding to the spray tank. Do not handle the clear inner bags with wet hands or wet gloves. Do not carry the bags on your person in a manner that allows contact with perspiration. Rough handling may cause breakage. Do not store at temperatures below 32°F (0°C). Allow to warm above 50°F (10°C) before use. Cooler water temperatures increase the time needed for the inner bag to dissolve completely.

Cynoff WSB insecticide is to be diluted with water for spray application. Do not use strainers finer than 50 mesh size. Fill sprayer with 1/2 of the desired volume of water, add the water soluble bag(s). After bag(s) have dissolved, fill sprayer to desired volume and shake for 30 seconds before use in order to insure proper mixing and suspension of the wettable powder. Shake or re-agitate the sprayer before use if spraying is interrupted. Mix only the amount of solution needed for the application; repeat treatments as necessary.

Pests		Concentration of Active Ingredient	Dilution Rate**
Ants Biting Flies*† Boxelder Bugs Centipedes Cockroaches (Maintenance) Crickets Earwigs Elm Leaf Beetles†	Firebrats Fleas* Flies* Millipedes Mosquitoes*† Pillbugs Silverfish Sowbugs	.1%	1 water soluble bag per 1 gallon of water
Bees Cockroaches (Clean-out) Spiders Ticks Wasps		.2%	2 water soluble bags per 1 gallon of water

* Outdoor use only.
† Not for use in California
** 1 water soluble bag = 0.33 ounces of Cynoff WP

Indoor Use

Crickets, Cockroaches, Firebrats, Silverfish, Spiders, and Ticks: Apply as a coarse, low pressure spray to areas where these pests hide, such as baseboards, corners, storage areas, closets, around water pipes, doors and windows, attics and eaves, behind and under refrigerators, cabinets, sinks, furnaces, and stoves, the underside of shelves, drawers and similar areas. Pay particular attention to cracks and crevices; also see OUTDOOR USE.

Ants: Apply to any trails, around doors and windows and other places where ants may be found. Refer to BARRIER TREATMENT directions to prevent infestation; also see OUTDOOR USE.

Bees and Wasps: Application to nests should be made late in the evening when insects are at rest. Thoroughly spray nest and entrance and surrounding areas where insects alight; also see OUTDOOR USE.

Boxelder Bugs, Centipedes, Earwigs, Elm Leaf Beetles, Millipedes, Pillbugs, and Sowbugs: Apply around doors and windows and other places where these pests may be found or where they may enter premises. Spray baseboards, storage areas and other locations. Refer to BARRIER TREATMENT directions to prevent infestation; also see OUTDOOR USE.

Food Handling Establishments: Places other than private residences in which food is held, processed, prepared or served. Not for use in USDA meat and poultry plants.

Non-food Areas: Includes garbage rooms, lavatories, floor drains (to sewers), entries and vestibules, offices, locker rooms, machine rooms, garages, mop closets, and storage (after canning or bottling). Cynoff WSB insecticide may be used as a general, spot or crack and crevice treatment in non-food areas. All areas where insects hide or through which insects may enter should be treated.

Food Areas: Cynoff WSB is not labeled for use in food areas. Do not use in any area where food is stored, prepared or processed. Do not use in food areas of food handling establishments, restaurants or other areas where food is commercially prepared or processed. Do not use in serving areas while food is exposed or facility is in operation. Serving areas are areas where prepared foods are served such as dining rooms but excluding areas where food may be prepared or held.

Outdoor Use

For control of ants, bees, biting flies, boxelder bugs, centipedes, cockroaches, crickets, earwigs, elm leaf beetles, firebrats, fleas, flies, millipedes, mosquitoes, pillbugs, silverfish, sowbugs, spiders, ticks, and wasps. Apply by brush or as a residual spray either by hand or power sprayer. Apply to surfaces of buildings, porches, screens, window frames, eaves, patios, residential lawns only such grass areas adjacent or around private homes, duplexes, townhouses, condominiums, house trailers, apartment complexes, carports, garages, fence lines, storage sheds, barns, and other residential and non-commercial structures, vegetation, refuse dumps, garages and in other areas where these pests are found.

Barrier Treatment: To help prevent infestation of buildings, apply to a band of soil and vegetation 6 to 10 feet wide around and adjacent to the building. Also, treat the building foundation to a height of 2 to 3 feet where pests are active and may find entrance. Apply as a coarse spray to thoroughly and uniformly wet the band area, using 1 gallon of spray mix per 400 square feet.

CAUTION:
Do not use water base sprays of Cynoff WSB in conduits, motor housings, junction boxes, switch boxes, or other electrical equipment because of possible shock hazard.

Do not apply this product to edible crops.

Do not apply this product to soil in crawl spaces. ‘

Keep people and pets off surfaces until dry.

Protect aquariums from spray mist.

Do not use this product with oil.

Do not treat pets with this product.

For best results, thoroughly wash out sprayer and screen with water and detergent before using Cynoff WSB Insecticide.

Distributors Should Sell in Original Packages Only.

Terms of Sale or Use: On purchase of this product buyer and user agree to the following conditions:

Warranty: FMC makes no warranty, expressed or implied, concerning the use of this product other than indicated on the label. Except as so warranted, the product is sold as is. Buyer and user assume all risk of use and/or handling and/or storage of this material when such use and/or handling and/or storage is contrary to label instructions.

Directions and Recommendations: Follow directions carefully. Timing and method of application, weather and crop conditions, mixture with other chemicals not specifically recommended and other influencing factors in the use of this product are beyond the control of the seller and are assumed by the buyer at his own risk.

Use of Product: FMC's recommendations for the use of this product are based upon tests believed to be reliable. The use of this product being beyond the control of the manufacturer, no guarantee, expressed or implied, is made as to the effects of such use or the results to be obtained if not used in accordance with directions or established safe practice.

Damages: Buyer's or user's exclusive remedy for damages for breach of warranty or negligence shall be limited to direct damages not exceeding the purchase price paid and shall not include incidental or consequential damages.

Cynoff and **FMC** —FMC trademarks (1193-4/21/94)

REVISIONS:

1. Revise Aircraft Uses
2. Add new logo.

TERMS TO KNOW

Acute Toxicity	a rapid response of the body, often within minutes or hours, to a single sufficiently high exposure of a pesticide or other chemical, and which brings about rapid symptoms of poisoning.
Chronic Toxicity	injury or illness that can result from repeated exposures, over time, to doses of some pesticides.
Hazard	is the risk of harmful effects from pesticides. The hazard of a pesticide depends on the toxicity of the pesticide (highly toxic, very toxic, slightly toxic) and the length of time, exposure, that the pesticide is in, or, on your body.
Non-target Organism	any plants or animals within a pesticide treated area that are not intended to be controlled by a pesticide application.
Rinsate	the liquid which results from rinsing empty pesticide containers or pesticide spray equipment.
Sensitization	substances, such as pesticides, which may cause harmful allergic reactions in certain people to exposures to some pesticides.
Signal Word	the word **DANGER**, **WARNING**, or **CAUTION**, that appears on a pesticide label that signifies how toxic the pesticide is and what toxicity category it belongs to.
Systemic	a chemical, such as a pesticide, that is taken up into the tissues of an organism and transported to other locations where it will affect pests.
Toxicity	the potential a pesticide has for causing harm.

Pesticide Exposure

When a pesticide comes into contact with an organism, that contact is called a *pesticide exposure*. For humans, pesticide exposure means getting pesticide in or on the body. The toxic effect of a pesticide exposure depends on how much pesticide is involved, what part of the body is effected, how toxic the pesticide is and how long it remains there. The precautionary and other warning statements on the label are meant to protect the applicator and the environment from harmful pesticide exposures.

Routes of Exposure

The first step in protecting yourself from the hazards of pesticides is to understand how they can enter the body, referred to as "routes of exposure". Pesticides contact your body in four main ways:

- dermal exposure - pesticide on the skin
- oral exposure - swallowing a pesticide
- inhalation exposure - inhaling a pesticide
- ocular exposure - pesticide entering the eyes

Dermal exposure is the most common type of exposure for the applicator since the skin is easily exposed when handling pesticides.

Oral exposure, or ingestion occurs least frequently with careful applicators, but exposures do occur when users eat, smoke, or drink around pesticides or forget to wash after use.

Inhalation, breathing a pesticide into the lungs, is less common, but is still a potential danger to the applicator.

Ocular exposures are particularly dangerous. The eyes, as well as the abdomen and groin absorb pesticides more quickly that do other parts of the body. The eyes and skin can also be badly damaged by the corrosive effects of many pesticides.

Avoiding Pesticide Exposure

The key to personal safety when handling pesticides is to avoid exposure. Always keep personal clothing, food, drinks, chewing gum, tobacco products, and other items away from where pesticides are being applied or stored. They could become contaminated and injure you when you use them.

Exposure and the resulting **hazards** that may occur when handling pesticides can be reduced significantly by following a few good work practices.

Wear personal protective equipment (PPE) when required by the label. The skin is the part of the body that is most likely to receive exposure from pesticide. Personal protective equipment is designed to protect your skin and other parts of the body from contact with pesticide residues.

When taking a break from activities involving pesticides, wash your gloves on the outside before removing them----then wash your hands and face thoroughly. If you desire to eat, drink, or smoke; it is now safe for you to do so.

Avoid getting pesticide on yourself when you use the toilet. The skin in the genital area has been shown to absorb more pesticides than any skin area. Be sure to thoroughly wash you hands *before* using the toilet.

When you finish working with pesticides for the day----clean all reusable personal protective equipment----even if they were worn for only a brief period of exposure to pesticides during that day. This includes washing chemical-resistant items such as gloves, footware, goggles, and respirators.

If personal protective equipment and clothing are brought home to be cleaned, be sure to place these items in a separate plastic bag or container. Keep pesticide contaminated clothing away from children or pets (that could injure themselves if the clothing is touched.) And remember to always wash personal protective clothing seperately from uncontaminated laundry, otherwise; pesticide residues may be transferred onto other clothing (that may harm you or your family.)

You can avoid pesticide exposures by:

- wearing personal protective equipment.
- washing exposed areas of the body often.
- keeping your personal protective equipment clean and working properly.

Signal Word

An important part of every label that alerts the applicator to the hazards of pesticide exposure is the **signal word**. Every pesticide label carries a signal word in large letters on the front panel following the child hazard warning "**KEEP OUT OF REACH OF CHILDREN.**" The signal word provides the pesticide user with an *indication* of the relative **toxicity** of the formulated product to humans and animals.

A misconception regarding signal words is that pesticides that bear a **Danger** or **Warning** signal word will control a greater variety of pests or control them more quickly than a pesticide with a **Caution** signal word. This is simply **not** true! The signal word does not tell you how well a pesticide will control a pest. For example, "**DANGER**" means the pesticide can be more dangerous to you, not more toxic to pests, than a pesticide labeled with "**CAUTION**".

Table 5.1 contains signal words listed in decreasing order of relative toxicity.

TABLE 5.1

DANGER	The product is ***very likely*** to cause **acute** illness from oral, dermal, or inhalation exposure, or to cause severe eye or skin irritation.**TYPICAL DANGER LABEL STATEMENTS**: *"Fatal if swallowed" . . ."extremely hazardous by skin contact" . . ."poisonous if inhaled".*
WARNING	The word **WARNING** indicates that the product is ***likely*** to cause acute illness from oral, dermal, or inhalation exposure or that the product is likely to cause moderate skin or eye irritation moderate toxicity **TYPICAL WARNING LABEL STATEMENTS**: *"Harmful or fatal if swallowed" . . . harmful or fatal if absorbed through skin" . . . "harmful or fatal if inhaled".*
CAUTION	The product has only ***slight*** potential to cause acute illness from oral, dermal, or inhalation exposure. Skin or eye irritation would likely to be slight. **TYPICAL CAUTION LABEL STATEMENTS**: *"Harmful if swallowed" . . . "may be harmful if absorbed through skin" . . . "may irritate eyes, nose, throat, and skin".*

DANGER with the word "poison" and the "skull and crossbones" symbol means *"very dangerous if swallowed or inhaled."* Without the word "poison" and the "skull and crossbones" symbol, **DANGER** usually means that the pesticide has a high potential as a skin or eye irritant.

The signal word associated with each pesticide listed above indicates its relative level of toxicity. Pesticides with a high toxicity value signify that relatively small quantities of the pesticide may cause serious illness or death. (see **Table 5.3**).

Following the signal word on a label is the statement which indicate the route(s) of entry posing the greatest risk to the applicator when handling the pesticide. These statements are related to the toxicity of the pesticide and indicate which parts of the body must be particularly protected. Often, the label will also indicate "specific action" statements that should be taken to prevent pesticide poisoning accidents:

"Do not breath vapors or spray mist"
"Avoid contact with the skin or clothing".

Knowing the product's general level of toxicity helps you choose the proper precautionary measures (which includes wearing the appropriate protective equipment) for handling and applying the pesticide.

It must be emphasized that the signal word is not based solely on the active ingredient of the pesticide, but on the contents of the **formulated** product. The signal word on a pesticide label indicates the **hazard** to you of *any* active ingredients, solvents, or inert ingredients contained in the formulation.

The EPA determines which signal word will be required on a label, not the manufacturer. A signal word is determined by the most severe toxicity category assigned to the four **acute toxicity** routes of exposure discussed above. For example, a pesticide product which exhibits low dermal and inhalation toxicity, but has moderate oral toxicity, must carry the signal word **WARNING.** Unfortunately, there is no information on the label to let you know which aspect of toxicity (oral, dermal, inhalation, ocular) determined the appropriate signal word. It is possible for a pesticide product which has a "**DANGER**" signal word to present a lower practical application hazard on the job, than a product with a "**WARNING**" signal word!

While the signal word provides the pesticide user with an *indication* of the relative toxicity of the formulated product, do not depend solely on these indicators when considering the potential dangers of a pesticide to humans; your understanding of the term "hazard" is equally important.

The terms hazard and toxicity do not mean the same! Toxicity is the relative capacity of a pesticide to cause harm to humans and animals. Hazard, on the other hand, is a function of two factors: *toxicity* **AND** *exposure.*

Toxicity

The ability of a chemical to damage an organ system, such as the liver or kidneys, or to disrupt a biochemical process, such as the blood-forming mechanism, or to disturb an enzyme system at some site in the body.

Simply stated, toxicity is the property of a chemical which causes damage to the body of a living organism.

Some pesticides are highly toxic to humans; only a few drops in the mouth or on the skin can cause extremely harmful effects. Other pesticides are far less toxic, but too much exposure to them will cause harmful effects also!

There are two types of toxicity, **acute** and **chronic**. **Acute toxicity** refers to exposure to a single dose of a pesticide which produces symptoms within a short period of time after the exposure. The pesticide label warns of the dangers of acute toxicity through the various precautionary statements and signal words. **Label Signal words are prominently displayed on the front panels of all pesticide labels.** They are based on a system which breaks pesticides into categories and specific ratings of toxicity. These specific ratings are described in terms of $\mathbf{LD_{50}}$, the lethal dosage of a pesticide necessary to kill 50 percent of a population of laboratory test organisms.

Every chemical you have in your home, whether it be in food or cleaning solvents used in and around the home, has some level of toxicity. Acute toxicity of various pesticides and other chemicals commonly found around the home can be compared by use of the $\mathbf{LD_{50}}$ ratings of each when found in a concentrated form. These ratings change when materials are diluted by manufacturers to be sold as formulated products and are changed further when diluted by the user during mixing. The higher the $\mathbf{LD_{50}}$ rating, the lower the toxicity. In some cases, the acute oral $\mathbf{LD_{50}}$ is so high that the chemical is said to be practically non-toxic. Chemicals with very low $\mathbf{LD_{50}}$ ratings are highly toxic (see **Table 5.2**).

TABLE 5.2

TOXICITY OF SOME PESTICIDES				
COMMON NAME	TECHNICAL LD_{50}		FORMULATION LD_{50}	
	ORAL	DERMAL	ORAL	DERMAL
CARBARYL	255	>2,000	281	>2,000
CHLORPYRIFOS	97	504	272	2,000
CYFLUTHRIN	500	>5,000	900	>5,000
DIAZINON	66	>2,000	910	>3,610
MALATHION	1,375	4,100	2,800	4,100
LD_{50} values are only a reference figure to use in comparing the relative toxicities of different pesticides.				

Acute toxicity from pesticides may be expressed as flu-like symptoms or a nervous system disorder while symptoms of **chronic toxicity** may be expressed in other forms. Chronic toxicity is used to describe the potential long term effects resulting from exposure to small amounts of a toxin over an extended period of time.

Chronic toxicity may impact different parts of the body than acute toxicity. Pesticides have long been feared as potential causes of forms of cancer, reproductive problems, and birth defects.

There is little research to prove that these possible effects occur. Many critics point out that there is a definite correlation between pesticides and chronic effects, while there are just as many critics who argue the opposite.

You can reduce the potential harmful effects of pesticides by remembering this simple fact: A pesticide left in its orginal unopened container will cause you no harm----regardless if it is labeled **Caution, Warning** or **Danger**. But once opened, the degree of hazard to the pesticide in *any* pesticide handling situation will depend on the preventive actions *you* take to *minimize* your exposure to that pesticide.

Exposure to Pesticides can result from:

❑ improper use of a pesticide, such as applying greater than label rates.

❑ not wearing appropriate protective clothing when handling pesticides, or,

❑ not properly cleaning and laundering your personal protective clothing contaminated by pesticide.

Throughout this **Workbook**, you have been instructed to read and understand the pesticide label to be sure you are applying the product safely and in accordance with its directions.

There are more than 2000 words in the average pesticide label. Do not try to memorize the contents of each and every label, but refer to it *every time* you use the product.

If, after reading the label and consulting with your supervisor, you are unsure where or how a pesticide should be applied; contact any one of the following organizations for assistance in interpreting the label:

- ❑ the pesticide manufacturer,
- ❑ the pesticide manufacturer's local representive,
- ❑ North Carolina Cooperative Extension Service or
- ❑ North Carolina Department of Agriculture & Consumer Services Structural Pest Control Division

TABLE 5.3

TOXICITY CATEGORIES				
	DANGER HIGHLY TOXIC CATEGORY I	**WARNING** MODERATELY TOXIC CATEGORY II	**CAUTION** SLIGHTLY TOXIC CATEGORY III	**CAUTION** TOXIC CATEGORY IV
ACUTE ORAL (LD50)[1]	Up to and including (A few drops to 1 teaspoon).	>50 thru 500 mg/kg (1 teaspoon to 2 tablespoons).	>50 thru 500 mg/kg (1 ounce to 1 pint).	>50 thru 500 mg/ (1 pint or more)
ACUTE DERMAL	Up to and including 200 mg/kg.	>200 thru 2000 mg/kg	>200 thru 5000 mg/kg	>5000 mg/kg
ACUTE INHALATION	Up to and including 0.05 mg/kg.	>0.05 thru 0.5 mg/liter	>0.5 thru 2mg/liter	>2 mg/liter
EYE IRRITATION	Corrosive (irreversible destruction of ocular tissue) or corneal irritation persisting for more than 21 days	Corneal irritation clearing in 8-21 days	Corneal irritation clearing in 7 days or less	Minimal effects Clearing in less than 24 hours
SKIN IRRITATION	Corrosive-tissue destruction and/or scarring	Severe irritation at 72 hours	Moderate irritation at 72 hours	Mild or slight irritation

[1] The toxicity of a pesticide typically is measured with a Lethal Dose (LD50) value. This value is the dosage necessary to kill 50 percent of a laboratory population of test animals (rats, mice, or rabbits). These toxicity values may be expressed in terms of a single dosage in milligrams per kilogram (2.2 pounds) of body weight (mg/kg). A LD50 value is a useful classification tool to aid pesticide users in comparing pesticides as to their degree of hazard.

Pesticide Label Precautionary Statements

Besides the signal word, pay close attention to any warnings included in the **Precautionary Statements** section. Precautionary labeling provides the pesticide user with information regarding the potential toxicity, irritation and **sensitization** hazard associated with the use of a pesticide. The precautionary labeling also identifies the precautions necessary to avoid exposure, any personal protective equipment (PPE) which should be used when handling a pesticide and first aid in case of accidental exposure.

These statements guide the applicator in taking proper precautions to protect humans or animals that could be exposed to the pesticide. (Sometimes these statements are listed under the heading **"Directions for Use"**).

Precautionary statements identify potential hazards and recommend ways that the risks can be minimized or avoided. Three areas of hazard that may be included on a pesticide label are:

- hazards to humans and domestic animals
- environmental hazards
- physical and chemical hazards (see **Unit 7**)

Hazards to Humans and Domestic Animals

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
MAY BE FATAL IF SWALLOWED. . . MAY BE ABSORBED THROUGH SKIN. . . MAY BE INJURIOUS TO EYES AND SKIN. . . Do not take internally. . . Do not get in eyes, on skin or on clothing. . . Avoid breathing vapors and spray mist. . . Wash thoroughly after handling.

The information contained in the above precautionary statement indicates which route or routes of entry (mouth, skin or lungs) are particularly hazardous. This part of the label will also provide specific actions that can prevent overexposure to the pesticide. The protective clothing and equipment required to handle or apply the pesticide will be listed under this heading.

You should now be aware that the signal word represents the formulated product's relative toxicity to humans. Even when the signal word for two different pesticides are the same, it should be understood that one pesticide may be many times more toxic than another against a particular **non-target** species. This is the case with some single dose rodenticides, which are highly toxic if accidentally eaten by pets, while other less-potent rodenticides, with a similar signal word, are much less toxic and might require a considerable amount to be consumed before signs of illness appear.

Personal Protective Equipment

Simply understanding the hazard of the pesticide you are using is not enough. To keep yourself safe, you must use all the recommended protective equipment properly.

Pesticide absorption through the skin (dermal exposure) is the most common cause of pesticide poisoning during mixing, loading, application, and equipment maintenance. You can minimize dermal exposure by wearing a long-sleeved protective suit, such as coveralls. It should cover your entire body except feet, hands, and head. If there is a chance that the coveralls may become wet from mist, spray, splashes, or spills, use a rubber apron or other outer garment that is resistant to chemicals.

Gloves made of natural or synthetic rubber, vinyl, or plastic are a very important way to keep pesticides away from your skin. Wearing gloves should be a standard practice when handling pesticides. Replace protective gloves often, even though they may not seem worn or contaminated. Never use leather, paper, fabric or lined gloves when working with pesticides. These materials easily absorb and hold liquids and dusts, and can become a serious source of exposure. Disposable gloves are appropriate if they can resist chemical penetration and are sturdy enough to resist puncturing or tearing during use.

Likewise, wear chemical-resistant boots or footwear during mixing, loading, and application jobs. **Never wear leather or canvas shoes**.

It is also important to protect your eyes from pesticides. Use a face shield or goggles when you are using pressurized equipment or liquid concentrates; where there is a chance for mists, dusts, or splashes. Protective eyeware must be worn when the label explicitly tells you to do so!

Breathing the pesticide into your lungs (inhalation exposure) is a problem where dusts, fine spray mists, smoke, fog, or vapors are generated. An inhaled pesticide is rapidly and almost completely absorbed by the body. Protect yourself from this kind of exposure. Wear a respirator during mixing and loading or during long periods of exposure to highly toxic pesticides which create fine dusts or mists, or whenever instructed by the pesticide label.

The two most common types of air-purifying respirators are:

1) mechanical filter respirators
2) chemical cartridges or canisters.

You should understand the differences between them.

Mechanical filter respirators provide protection only against dusts. These masks are made of paper-like polymesh materials designed to be disposed of after use.

Chemical cartridge or canister respirators provide protection against pesticide gases and vapors. In addition, you can get a combination respirator which will protect you against both dusts and gases.

Sometimes the label specifies the type of respirator to use. In most cases, the label merely requires a respirator approved for pesticide use by the **National Institute for Occupational Safety and Health** (NIOSH) and the **Mine Safety and Health Administration** (MSHA). Seek advice from your state regulatory officials, county extension agent, pesticide dealer, or other authorities about selecting the right respirator for the type of work you will be doing.

Looking again at the example **Precautionary Statements** provided at the beginning of this section, the minimum personal protective equipment that must be worn by the pesticide applicator include:

- protective footwear
- coveralls or protective suit
- gloves
- safety goggles
- respirator

Many pesticide labels instruct the pesticide user to wear *chemically-resistant* PPE. It is important to mention again, that unless the pesticide label directs otherwise, **do not** use items that are made of or lined with absorbent materials such as cotton, leather, and canvas. These materials are **not** chemical resistant, and they are difficult or impossible to clean if contaminated with a pesticide. Even dry formulations can move quickly through woven materials and may remain in the fibers after several launderings.

Protective clothing and equipment are listed on many pesticide labels used in structural pest control.

In spite of the fact that some labels do not contain these statements, this doesn't mean that protective clothing or equipment is not necessary.

Long-sleeved shirts, long-legged pants, and gloves should be worn, *for minimum protection*, when applying pesticides!

The information contained in **Table 5.4** should be used a guide to determine the minimum chemically-resistant personal protective equipment requirements while handling pesticides. Again, **always** refer to the pesticide label for specific PPE recommendations! (See next page).

TABLE 5.4

LABELING STATEMENT	ACCEPTABLE PPE
Long-sleeved shirt and long-legged pants	❖ long-sleeved shirt and long-legged pants woven or nonwoven coverall ❖ plastic or other barrier-coated coverall ❖ rubber or plastic suit
Coverall worn over short-sleeved shirt and short pants	❖ coverall worn over short-sleeved shirt and short pants ❖ coverall worn over long-sleeved shirt and long legged pants ❖ rubber or plastic suit
Coverall worn over long-sleeved shirt and long-legged pants	❖ coverall worn over long-sleeved shirt and long-legged pants ❖ coverall worn over another coverall ❖ plastic or other barrier-coated coverall ❖ rubber or plastic suit
Chemical-resistant protective suit	❖ plastic or other barrier-coated coverall ❖ rubber or plastic suit
Waterproof gloves	❖ any rubber or plastic gloves sturdy enough to remain intact throughout your pesticide handling activities
Chemical-resistant gloves	❖ barrier-laminate gloves ❖ butyl gloves ❖ nitrile gloves
Shoes	❖ leather, canvas or fabric shoes with chemical resistant shoe ❖ coverings (booties) ❖ chemical-resistant shoes ❖ chemical-resistant boots
Protective eyewear	❖ shielded safety glasses ❖ face shield ❖ goggles ❖ full-face style respirator
Dust mist filtering respirator	❖ dust/mist respirator ❖ respirator with dust/mist filtering cartridge ❖ respirator with organic vapor-removing cartridge and pesticide prefilter ❖ respirator with canister approved for pesticides ❖ air-supplying respirator

Reentry Statement

Pesticides with the signal word **DANGER** or **WARNING** will contain a "**Reentry Statement**" under the **Hazards to Humans and Domestic Animals** heading. This statement tells how long you or the building occupants must wait after a pesticide application before reentering a treated area *without the required protective clothing.* The reentry statement may be printed in a box under the heading "**Reentry**". For pesticides most likely to be used in structural pest control, it may be in a separate section with a title such as "**IMPORTANT**, "**NOTE**", or "**GENERAL INFORMATION**".

If no reentry statement appears on the label, then you must wait until the treated surface has dried (carpets treated for fleas with liquid application should be dry to the touch). Dusts and mists (the spray particles of some aerosol insecticides may remain suspended in air for several hours!) must settle out of the air before allowing people or pets to enter the area without protective clothing.

Pets and Pesticides

One of the most sensitive issues in the structural pest control industry is the safety of a customer's pet during and after a pesticide application. Pets living in a customer's residence may include dogs, cats, birds, snakes, fish, hamsters, etc. Improper pesticide application may affect the pet directly, or indirectly; through contact with its food and water supplies, bedding and pet toys.

Animals are susceptible to pesticide injury, just as humans are. Fish and birds are among the most susceptible to pesticides. Cats are very sensitive because they are unable to detoxify (break-down) many types of pesticides. Young animals and older or sick animals may be affected by lower pesticide doses than adult or healthy animals. Cats and dogs generally lie and sleep on the ground or surfaces that may have been treated. They instinctively clean and groom themselves by licking their fur, which further increases their potential for exposure to pesticides.

To keep pets safe from pesticide contact, remove them from the area before making any pesticide application. Fish tanks should be well covered to prevent pesticide mists from drifting over and into the water. Keep them away until the spray dries and the area is well ventilated.

Before returning the animals to the treated area, flea collars, if used, should be removed. Flea collars usually contain an insecticide. Therefore, they should be removed from pets before the animals are allowed back into the treated areas. Otherwise, your application of pesticide plus the pesticide contained in the flea collar could elevate the level of pesticide(s) on the pet above the safe exposure level.

You should not make the decision whether it is safe to leave flea collars on or to continue medications; this decision should be made by the customer after having consulted with a veterinarian! Before applying a pesticide, it is important to discuss with the customer about any topical or **systemic** medications used on the pets for the control of animal parasites, such as, heart worms, fleas, mites, etc.

Environmental Hazards

Pesticides are useful tools, but improper or careless use could be harmful to the environment. The label lists environmental precautions that will help you avoid damaging nearby streams and ponds, harming beneficial insects (for example, bees), or polluting ground water and provides practical ways to avoid harm to the environment.

These statements appear on almost every label and may warn of pesticide risks to:

- wildlife,
- birds,
- fish,
- bees,
- and other aquatic animals (shrimp, crayfish, turtles, etc).

Examples of environmental hazards that may appear on a pesticide label are:

"This pesticide is highly toxic to fish, aquatic invertebrates and wildlife. Birds in treated areas may be killed."

"Do not contaminate water by cleaning of equipment or disposal of wastes."

When reading a pesticide label, carefully review the environmental hazards section. Just because a pesticide is classified as relatively non-hazardous to humans does not mean it can not damage the environment. Some pesticides can cause significant harm to the environment, even though they are slightly or moderately hazardous to people. Sometimes the small differences in the wording of these statements for different pesticides reflects large differences in the safety of the pesticide to the environment.

For example, a pesticide which is labeled:

Highly Toxic to fish	**Is 1,000 times more toxic Toxic to fish than one that states:**	Toxic to fish

Environmental hazard statements help you to choose the least toxic pesticide for a particular job. They are reminders to use good common sense to avoid contaminating the environment.

Statement of Practical Treatment

The **Statement of Practical Treatment** provides you with emergency first aid instructions in case a pesticide is swallowed, inhaled, or splashed into the eyes.

This section of the label appears on the front panel of the label. Often it will provide specific information to physicians, **"Note to Physicians**", concerning medical treatment in case of poisoning. The **Note to Physicians** provides emergency medical personnel with poison treatment information, antidotes, and often provides an emergency phone number to contact for further medical information.

All **DANGER** and some **WARNING** and **CAUTION** labels contain a note to physicians describing medical procedures for poisoning emergencies.

READ THE RULES!

STRUCTURAL PEST CONTROL DIVISION RULES AND REGULATIONS regarding first aid and [pesticide] poisoning.

Section .0403 First Aid. First aid equipment and first aid procedures, approved by the EPA or Federal Occupational Safety and Health Administration, shall be placed in all service vehicles and in all other areas where pesticides are stored or handled.

Section .0404 Poisoning. In case of poisoning, the licensee or his authorized agent or the certified applicator shall, upon demand of the committee or enforcement agency, reveal upon verbal or written request, the name(s) of pesticide(s), active ingredient(s), and formulation therein as used, whether it be solid, liquid, or gas, to:

(1) the client or his authorized agent,
(2) a physician,
(3) the Committee,
(4) The Division.

Typical statements of practical treatment found on a label are:

"In case of contact with skin, wash immediately with plenty of soap and water."
"In case of contact with eyes, flush with water for 15 minutes and get medical attention."
"If swallowed, drink large quantities of milk or water."

NOTE: depending on the type of pesticide swallowed, the first aid instructions may state "**do not induce vomiting**" or it may recommend to "induce vomiting". Be thoroughly familiar with all first aid requirements of the label before an accident happens!

Know who to call for help in the event of a pesticide emergency:
In North Carolina, contact:
Carolinas Poison Center
Charlotte, NC
1-800--84 TOXIN
(86946)

In the event of suspected pesticide poisoning, you must follow the label's first aid advice and then immediately call a physician. Take the pesticide label (or MSDS) with you to the physician's office. The physician will need the information on the label to prescribe the proper treatment.

Storage of Pesticides

Directions for proper storage of the pesticide and empty pesticide containers are another important part of the label. Some pesticides have special requirements. Always consult the pesticide label for safe pesticide storage. When in doubt regarding the storage of structural pesticides, contact the **Structural Pest Control Division**.

Pesticides should be stored in a designated area, preferably a separate room. The room must be securely locked at all times when not in use and should have a sign clearly designating this area for pesticide storage:

DANGER!

KEEP OUT — PESTICIDE STORAGE!

The storage area should be kept dry and cool and well ventilated to the outside. It should have cement or some other type of floor that will not absorb spilled pesticide. **There should be no floor drains in the storage area**! A fire extinguisher, as well as spill clean-up materials, should be available nearby.

READ THE RULES!

Structural Pest Control Division Rules regarding pesticide storage, Section.0401 **Public Safety: storage and handling of [pesticide] containers:**

(a) All pesticides shall be kept securely, in leakproof containers and labeled.

(b) In no case shall containers of pesticide(s) be left where pets, domestic animals, children or other unauthorized persons might remove or consume the contents.

(c) Food containers shall not be used as pesticide containers.

(d) When pesticides are stored or transported in or on a vehicle, a suitable storage space shall be provided.

If a pesticide container is damaged or leaking, immediately transfer the contents to another container with an identical label. Then clean-up any spilled pesticide according to label directions. Store all pesticides in their original labeled containers. **Never** store them in other containers.

Benefits of proper pesticide storage:

- protects humans and animals from accidental exposure.
- prolongs the pesticide's shelf life by eliminating excess moisture and temperature extremes.
- protects the pesticides from theft and reduces the likelihood of liability in the event of unauthorized pesticide use by vandals.
- proper pesticide storage also includes pesticides you carry in your company service vehicle

Disposal of Pesticides

Proper disposal of unused pesticides and pesticide containers is essential to reduce human and environmental hazards. As a pesticide user, *you are responsible* for ensuring proper disposal of pesticide wastes, excess pesticides and empty pesticide containers.

All pesticide labeling must include instructions for proper disposal of pesticides and pesticide containers. These instructions cover the disposal of any unused pesticide product, any **rinsate** resulting from cleaning of pesticide application equipment, and the disposal of the empty pesticide container.

All pesticides must bear the following statement immediately under the heading "**Storage and Disposal**":

"Do not contaminate water, food, or feed by storage and disposal."

In all cases, it is best to prepare pesticide containers for disposal immediately upon emptying the container. Cleaning empty containers prior to disposal is **always** easier and more thorough when completed soon after emptying the container.

Typical disposal statements are found in **Table 5.5.** (See next page).

Table 5.5

CONTAINER TYPE	DISPOSAL STATEMENTS
Metal Containers (non-aerosol)	Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.
Paper and Plastic Bags	Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration.
Glass Containers	Triple rinse (or equivalent). Then dispose of in a sanitary landfill or by other approved State and local procedures.
Fiber Drums with Liners	Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner in a sanitary landfill. If drum is contaminated and cannot be reused, dispose of in the same manner.
Plastic Containers	Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration.

TEST YOUR UNDERSTANDING

MULTIPLE CHOICE.

Select the best answer of the 4 choices provided:

5.1 Some pesticide labels bear a **WARNING** statement. What does this mean to you?
a. eventually I will get sick if I use it often enough
b. I need to wear a respirator every time I use the product
c. the product requires that I exercise greater care in its use than a product with a **CAUTION** signal word
d. the active ingredient is highly toxic to the environment

5.2 What two factors determine the hazard of a pesticide to the applicator?
a. the equipment used and the pressure of the spray
b. the active ingredient and the formulation
c. toxicity of the pesticide and the length of exposure to the pesticide
d. the amount of active and inert ingredient in the pesticide

5.3 **DANGER** on a pesticide label means:
a. to be applied only by certified applicators
b. the product is twice as deadly on structural pests as one labeled **CAUTION**
c. the product is toxic to birds and fish
d. the product is highly toxic to humans

5.4 The statement "**Keep Out of Reach of Children"** appears on the labels of _____ pesticides.
a. highly toxic
b. moderately toxic
c. slightly toxic
d. all of the above

5.5 A pesticide label with a **CAUTION** signal word means the pesticide:
a. has no protective equipment requirement while handling the pesticide
b. is safe to use indoors
c. is relatively non-toxic to wildlife
d. is relatively non-toxic to humans

FILL-IN THE BLANK

Complete each statement with the appropriate word(s).

5.6 The signal word provides the pesticide user with an *indication* of the relative _____ of the_____ product to humans and animals.

5.7 If a specific reentry period is not noted on the pesticide label, surfaces treated with liquids must _____ or dusts and mists must _____ before allowing other people or pets to enter the area, without protective clothing.

5.8 In the event of suspected poisoning from exposure to a pesticide, you must follow the label's first aid advice and then immediately_____ _____.

5.9 Pesticide absorption through the_____is the most common cause of poisoning that can occur during mixing, loading, applying, and cleaning pesticide equipment.

5.10 List the four ways pesticides can contact your body:

_____

_____

_____

_____

5.11 The word **WARNING** indicates that the product is_____ to cause acute illness from oral, dermal, or inhalation exposure.

5.12 When in doubt regarding the proper storage of structural pesticides, contact the _____.

5.13 The _____provides emergency medical personnel with poison treatment information.

5.14 The signal word on a pesticide label indicates the _____to you of *any* active ingredients, solvents, or inert ingredients contained in the formulation.

5.15 The higher the LD50 rating, the _____the toxicity of a pesticide.

TRUE or FALSE.

Read each statement. Decide whether the statement is true (**T**) or false (**F**). Circle your answer.

5.16 The terms hazard and toxicity have the same meaning.

T F

5.17 Proper disposal of unused pesticides and pesticide containers is essential to reduce human and environmental hazards.

T F

5.18 Unlike humans, most animals are not susceptible to pesticide injury.

T F

5.19 The two types of toxicity to pesticides are acute and severe.

T F

5.20 Pesticide absorption through the eyes (ocular exposure) is the most common cause of pesticide exposure during mixing, loading, applying, and cleaning of pesticide application equipment.

T F

5.21 Pesticides that bear a **Danger** or **Warning** signal word will control a greater variety of pests than a pesticide with a **Caution** signal word.

T F

5.22 Acute toxicity is used to describe the potential long term effects which could result from exposure to small amounts of a toxin over time.

T F

5.23 Overexposure can result from improper use of a pesticide.

T F

5.24 The **Statement of Practical Treatment** provides the pesticide user with information regarding the potential toxicity, irritation and sensitization hazard associated with the use of a pesticide.

T F

5.25 In the event of suspected poisoning from exposure to a pesticide, you must immediately induce vomiting of the victim.

T F

Answer completely questions 5.26 to 5.31.

5.26 Does the pesticide label contain all the instructions and directions for use that you need to the product safely and legally? Explain.

5.27 What is the meaning of the statement: "It is a violation of Federal law to use this product in a manner inconsistent with its labeling"?

5.28 What types of hazard statements should you look for on the pesticide labeling?

5.29 Name and explain the meaning of the signal words and symbols you may see on a pesticide product?

5.30 Explain the differences between chemical name, common name, and brand name. Which of these terms should you use to most accurately identify a pesticide product?

_____
_____
_____
_____
_____
_____
_____
_____

5.31 Explain the differences between the terms "label" and "labeling."

_____
_____
_____
_____
_____
_____
_____
_____

Upon completion of each unit in the **Registered Technician Introductory Training Workbook**, the unit must be signed and dated by the designated trainer and the registered technician trainee.

When all units of the **Registered Technician Introductory Training Workbook** are completed by the registered technician trainee, the signature of the licensee at the end of Unit 8 will verify successful completion of the **Workbook**.

_____	_____
Registered Technician Trainee	**Date**
_____	_____
Designated Trainer	**Date**

NOTES:

TERMS TO KNOW

Active Infestation	evidence of present activity by that organism, visible in, on, or under a structure, or in or on debris under the structure.
Food	articles used for food or drink for humans or other animals, including pet food and feed for other domestic animals.
Food Areas	this term includes areas for receiving, serving, storage, packaging (canning, bottling, wrapping, boxing), preparing (cleaning, slicing, cooking, grinding).
Food Handling Establishment	an area or place other than a private residence in which food is held, processed, prepared, and/or served. Such places includes restaurants, lunchrooms, catering facilities, cafeterias, bars and taverns.
Harborage	A site where shelter, food, and water are available to allow pest populations to thrive.
Non-food Areas	this term includes garbage room, lavatories, floor drains, offices, locker rooms, machine rooms, boiler rooms, mop closets, and storage areas.
Open Porch	any porch without fill in which the distance from the bottom of the slab to the top of the soil beneath the slab is greater than 12 inches.
Slab-on-Ground	a concrete slab in which all or part of that concrete slab is resting on or is in direct contact with the ground immediately beneath the slab.
Structure	all parts of a building, whether vacant or occupied, in all stages of construction.

Why Am I Using a Pesticide

No doubt, you decided to use a pesticide because you have exhausted all other pest control options, such as proper sanitation procedures, pest proofing the structure, use of baits, low impact biorationals, trapping, and other non-chemical control methods.

> **Pest management** is the science of preventing, suppressing, or eliminating undesirable pests in *the least toxic, most effective manner.* A successful pest management program requires choosing the appropriate control techniques and knowing how to use these techniques to reduce pest populations.
>
> **Pest management** programs use current, comprehensive information of the life cycles of pest and their interactions with the environment. This information, in combination with available pest control methods, is used to make pest damage with the least possible hazard to people, property and the environment.
>
> **Pest management** will include not only chemical products intended to kill pests, **pesticides;** but also non-chemical methods that can be equally effective in the reducing and eliminating pests as well.

When you have made the decision to use a pesticide, your first question should be *"Which pesticide to use?"* This is a very important question since the pesticide you select should not only control pests but also must prevent pesticide accidents to you and the environment. The **Directions for Use** found on every pesticide label can help with this decision.

Licensed, professional structural pest control operators generally make this decision on their own. As a registered technician trainee, however, the decision regarding which pesticide to use will probably be the responsibility of your supervisor. However, when in doubt about a pesticide selection, you should contact the North Carolina Cooperative Extension Service, your Structural Pest Control regulatory agency, your local trade association, pesticide dealers, or other authorities to help you choose the safest and most effective pesticide for the job.

As you are now aware, most pesticides are available in different formulations; each with specific advantages and disadvantages **(see Unit 4 – Formulations)**. You should make your selection of a particular pesticide and formulation based on both the safety and effectiveness of the pesticide.

Some pesticide formulations are more hazardous to people than others. Emulsifiable concentrates and ULV concentrates often contain solvents that are hazardous or that allow pesticide to pass through skin more quickly. It is important to remember that the best pesticide to control a pest problem should also be the *least hazardous* formulation to the people and pets who may be exposed to the pesticide during or after the application.

The **Directions for Use** on the label is usually the largest part of the text on a pesticide label and for good reasons: the instructions on how to use the pesticide are a very important part of the label for you to read and understand.

When reading a pesticide label, there may be terms used to describe when and how to use the pesticide with which you are unfamiliar. Your understanding of these terms will help you obtain maximum results from the application of pesticides. Some of these terms are explained in the **TERMS TO KNOW** at the beginning of this unit.

To emphasize the importance of *your* responsibility to read and understanding the contents of a label before applying any pesticide, the EPA requires that the **Directions for Use** section of *every* label begins with the statement:

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

The **"Directions for Use"** section of a pesticide label will provide you with the necessary information to help answer questions regarding your decision to use of a pesticide:

- What pest(s) or problems am I attempting to control?
- Where can I apply the pesticide?
- Do I need specific equipment necessary and if so, what type?
  - ❖ What are the preferred methods of application?
- How much product should I use?
  - ❖ How do I mix it?
- What special precautions must I take?
  - ❖ Does it stain? (Should it be used around certain fabrics, papers, electronic equipment or other materials?)
  - ❖ Is it phytotoxic (Can it damage plants if I apply an outside perimeter treatment?)
  - ❖ Do I need to cover food or food preparation surfaces?

The **DIRECTIONS FOR USE** section usually will be revised more frequently than any other section of the label. **Make sure you have the most current label!**

What Is (Are) The Target Pest(s)?

Once the pest is found, it should be positively identified before selecting and applying a pesticide. Positive identification of the pest is necessary to make a thorough evaluation of the pest problem and an appropriate recommendation for control. Knowing the pest makes it much easier to inspect for other evidence of infestation, harborage areas, and the means by which the pest gained entry into the structure. The more you know about the pest and the factors that influence its development

and spread, the easier and more successful your pest control efforts will be. Your training at the **Registered Technician School** will provide you with this information.

Sometimes, a pesticide application fails to control a pest because the pest was not identified correctly and the wrong pesticide (or wrong formulation) was chosen.

Where Can I Apply The Pesticide?

Pesticide products are labeled according to the site of application; e.g., one flea control product might be labeled for outdoor use on turf, another for indoor use on carpets, and yet another for use on pets. Therefore, it is essential to *identify the site* to which the pesticide will be applied.

Can I apply the pesticide to control *any* pest in that particular site? Let's imagine you want to control crazy ants in the food handling area of a restaurant. The pesticide you selected allows application to this area, however; you find that the target pest, crazy ants, is not on the label. Is it legal to apply the pesticide?

As long as the site, the food handling area, is listed on the label and the label does not specifically forbid use of this pesticide against the target pest at this site, it is permissible to use the pesticide.

Most pesticide misuse is the result of a failure of the pesticide applicator to read and understand or follow the **Directions for Use.**

Some pesticide formulations are more likely than others to cause unwanted harm to plant, animals and certain surfaces found in or around structures. Emulsifiable concentrates may tend to stain painted finishes and may injure plants when applied as an outside perimeter application. On porous surfaces, such as wood, concrete block or brick, consider using a wettable powder rather than an emulsifiable concentrate. The wettable powder formulation will leave more pesticide remaining on the surface.

Porous surfaces may absorb pesticides readily, especially liquid or gas(fumigant) formulations. If your objective is to saturate the surface with pesticide, as would be the case for control of certain wood-destroying fungi, liquid pesticide applications using water soluble formulations would be desirable.

Dusts are likely to leave a visible residue that may be objectionable to customers. When a pesticide is broadcast over a extensive area, such as home yards, gardens, and woodland areas for control of fleas and ticks, the formulation must be chosen with great care to avoid poisoning nontarget organisms in the area.

Typical pesticide label statements that should alert you to these considerations include:

"Do not apply directly to carpet as discoloration may occur."

" Birds feeding on treated areas may be killed. Irrigate immediately after application."

" Pesticide activity on porous surfaces may be limited."

Statements similar to these have already been mentioned in the Unit 5 - **Precautionary Statements**. They may also appear in the **Directions for Use** on the label.

A site on a label can be very broad, such as "apply pesticide as a residual spray to outside surfaces of buildings including porches, screens, window frames, eaves, patios, garages, refuse dumps and other areas"; or they can be very specific, " may be used as a crack and crevice treatment or as a spot application, not to exceed an area of 2 sq ft in non-food areas."

How Is The Pesticide Applied?

The **Directions for Use** may recommend specific equipment for use in applying the pesticide. Before selecting a particular formulation, make sure you have the necessary equipment and that it is working properly. For example, ULV formulations are useful to control flying insect pests in enclosed spaces and are designed to be used "as is" or to be diluted with small quantities of specified solvents, such as refined petroleum oils. These formulations require specialized equipment, called foggers, to apply the pesticide.

In addition to recommendations for the type of equipment that should be used, the **Directions for Use** will often state specific methods of application (application techniques) that must be followed when applying the pesticide.

These application techniques are used to improve pesticide coverage and achieve better control of pests. Often, the amount of pesticide can be lowered without sacrificing the quality of pest control. The choice of the right pesticide application technique can also reduce human and environmental hazards.

Following are detailed descriptions of several application techniques you will encounter on pesticide labels. It is very important that you understand the exact meanings of these terms. You must apply all pesticides as specified on the label.

KNOW THE TALK!

The words "must", "shall" and other positive statements on a label are used to note any items and/or actions specifically required by *FIFRA*.

The word "should" is used to identify any items and/or actions, that, while not specifically required by *FIFRA*, **are preferred** for the sake of increasing consistency and quality in the application of the pesticide.

Crack and Crevice

In a crack and crevice treatment, a small amount of insecticide is injected directly into a crack or crevice where pests may live or hide, or through which they may enter a structure. Such openings commonly occur at expansion joints, between different elements of construction (e.g., wood on concrete) and between equipment and flooring. The treatment may involve injecting an aerosol, dust or liquid insecticide into a crack.

Crack and crevice treatments are ideal because they deliver the insecticide where pests live and out of contact with people and pets. Therefore, these treatments are more effective and reduce the potential exposure to your customers and you.

Be very cautious when applying pesticides in food handling establishments. The application of insecticides for the control of pests in and around food sources requires considerable care on the part of the pest control operator. It is essential that no insecticide of any type come in contact with food products.

A typical label may state:

Food Areas:

"Limited to crack and crevice treatment only. . . . applications of this pesticide in the food areas of food handling establishments, other than as a crack and crevice treatment, are not permitted."

Spot Treatment

A spot treatment is the application of an insecticide to an area not larger than two square feet (1' x 2'). These areas may occur on floors, walls, or the undersides of cabinets and equipment. Spot treatments allow for precise application of pesticide against specific target pests rather than treatments being applied to the entire area. For example, cockroaches usually crowd into localized **harborages,** e.g. corners, cracks and crevices, etc. Spot treatments directed at these "hot spots" can reduce or eliminate the infestation before the roaches spread over larger areas.

Residual insecticides are those products applied to obtain insecticidal effects lasting several hours or longer and applied as general, spot, or crack and crevice treatments.

Non-residual insecticides are those products which are effective only during the time of treatment, such as space treatments, or for a short period of time after the insecticide has dried or settled from being airborne. Most non-residual insecticides decompose within an hour or two following application. Examples of non-residual insecticide applications are aerosol, ULV and fog treatments.

Space Treatment

Space treatments include aerosols, fogs, or ultra-low dosage applications of pesticide. These devices spray fine particles of a non-residual pesticide directly into the air in a confined area. The pesticide particles remain airborne for a period of time, typically 1-2 hours. Space treatments contact and kill crawling and flying insects that are present and exposed during application. Space treatments lack crack and crevice penetration. They are not fumigants!

Void Treatment

A void treatment is the application of an insecticide, usually a dust, into a small or large void. A void may be as small as the space between two cabinets or as large as an attic. Void treatments need to be performed with a material that will spread out to cover all surfaces of the void where pests may live or hide. Dust formulations generally work best in a void.

Broadcast Treatment (General treatment)

A broadcast or general treatment, involves the application of insecticide to large areas of a surface, such as walls, floors, attic, or crawlspace. An example of a broadcast treatment is the application of a liquid or dust residual pesticide to an entire carpet for flea or carpet beetle control.

Barrier Treatment (band or exterior perimeter treatment)

In residential home and business environments, pesticide applications to outdoor areas, such as the foundation and adjacent soil, are called barrier or band treatments. Barrier treatments using residual sprays, dusts or granules are effective in controlling various outdoor pests, such as millipedes, sowbugs, ants, etc., which occasionally enter a structure, before they enter the structure.

How Much Product Should I Use

One of the most important tasks for a structural pesticide applicator is making sure that the correct amount of pesticide is being applied to the target site. For each pesticide application, take the time to determine how much you need to apply. Then be sure that you apply the correct amount.

Do not use any more than the amount listed in the **"Directions for Use"** on the pesticide label. Using more product than the labeling recommends will not do a better job of controlling pests, and it is illegal. Over application may cause damage or injuries, leave illegal residues, and result in civil penalties (fines) or cause you to be sued for damages or injury.

Study the **"Directions for Use"** section on the pesticide label to find out how much pesticide you should apply. If the label lists a range of possible amounts, use the least amount of pesticide that will achieve good control of the pest.

Pesticide labeling often express application rates in terms of how much pesticide should be applied to a site.
This requires precise measurement of the site. The following basic formulae are important for you to know before beginning the pesticide treatment.
To determine the area of a room or space:

AREA (square feet) = Length X Width

To determine the volume or amount of space in a room or similiar structure:

VOLUME (cubic feet) = Length X Width X Height

Frequently, label directions may further require the diluted pesticide be applied to a specific unit of area.

"Entire carpet may be treated. Mix 3 ounces of product per gallon of water. Apply the spray evenly"(1 gallon/800 square feet).

What Special Precautions Must I Take?

Whenever you apply a pesticide, you have the legal responsibility to make sure that no one is overexposed to pesticides that you or those you supervise are handling.

State certification is required to supervise others when handling restricted use pesticides.

Always inform customers about the pesticide you intend to use and how long they must stay out of treated areas. The label is your best source of information regarding reentry.

Apply pesticides that minimize movement of the pesticide (drift or runoff) away from the application site. Avoid dusts and high pressure sprays in any indoor environment where air currents are likely to carry the pesticide away from the target site.

Instruct customers to turn off air conditioners and circulation fans during the pesticide application. It is your responsibility to make sure that this is done before you begin spraying!

Some labels now require the pesticide applicator to check for leaks following application of certain pesticides. When leaks are found, they must be cleaned prior to leaving the application site.

To clean pesticide leaks or spills, it is important to keep a spill cleanup kit on hand at all times. The kit should contain not only all the items needed for prompt and complete cleanup, but also personal protective equipment to protect you while you are dealing with the spill.

TEST YOUR UNDERSTANDING

Included within this unit are 4 pesticide labels:

Dursban Pro Insecticide

SAGA WP Insecticide

Dursban TC,

Premise 75

The pesticide labels included in this Unit are intended for *training purposes only*. While up-to-date at the time of printing, these labels may change. Always refer to the most current label when performing any structural pest control activity.

This exercise will test your ability to understand and *follow* the directions provided on a label.

You must complete both sections. Your training is for both P and W registration even though you may initially work in only one area of structural pest control.

SECTION EXERCISE 6.P HOUSEHOLD PESTS

To complete the following questions, refer to the **SAGA WP** and **Dursban Pro** insecticide labels.

6.P.1 **Dursban Pro** is equally toxic to birds and fish.

T F

6.P.2 What type of pesticide formulation is **SAGA WP**?

_____

6.P.3 What type of pesticide formulation is **Dursban Pro**?

_____

6.P.4 **Dursban Pro** may be use indoors as a space treatment?

T F

6.P.5 The common name of **SAGA WP** is _____.

6.P.6 To minimize airborne particles with **Dursban Pro**, spray pressure should be at least 60 psi.

T F

6.P.7 Give a specific area of a house where a respirator must be worn when applying **Dursban Pro**.

_____

6.P.8 **Dursban Pro** may not be applied within pet stores and kennels.

T F

6.P.9 For general pest control indoors, what dosage rates are permitted by the **Dursban Pro** label?

_____

6.P.10 To prepare a 0.5% emulsion of **Dursban Pro** requires:
a. a respirator
b. 2 and 2/3 fluid ounces of **Dursban Pro** for each gallon of water
c. almost 100 ounces of **Dursban Pro**
d. both a. and b.

6.P.11 Ten level "scoopfuls" of **SAGA WP** contains how much product?:
a. 0.1 ounce
b. 10 ounces
c. 1.0 ounce
d. 0.5 ounces

6.P.12 Prior to applying **SAGA WP** to carpet for control of fleas, what is recommended be done first?

_____.

6.P.13 **Dursban Pro** may be used on ornamentals?

T F

6.P.14 Following an application of **Dursban Pro** to carpet for control of fleas indoors; the carpet is dry to the touch after 1 hour. You can safely return pets to the treated area.

T F

6.P.15 You can use **Dursban Pro** in ULV/ULD application equipment.

T F

6.P.16 **Saga WP** may not be applied within cabs, trains or planes.

T F

6.P.17 The active ingredient in **Dursban Pro** is:

_____

6.P.18 **Dursban Pro** may be applied to pets for control of fleas, ticks, and lice.

T F

6.P.19 Describe how to make a "stable emulsion" of **Dursban Pro**?

_____

_____

_____

6.P.20 Applications of **Dursban Pro** are not permitted in nursing homes for the elderly.

T F

6.P.21 High volume broadcast spray mixtures of **Dursban Pro** can be applied as a perimeter treatment at 1 gallon per 100 square feet.

T F

6.P.22 Crack & crevice application of **SAGA WP** is permitted in non-USDA inspected facilities when the facility is in operation.

T F

6.P.23 Unopened or half-empty containers of **Dursban Pro** insecticide can be wrapped in paper and disposed as regular trash.

T F

6.P.24 **Dursban Pro** applied as an outside foundation spray will not harm foundation plants.

T F

6.P.25 Following the directions on the **Dursban Pro** label, how many gallons of spray mixture is needed to treat a 16' X 18' living room for carpet beetles indoors?

a. 10 gallons
b. 15 gallons
c. 100 gallons
d. a specific amount is not specified on the label

6.P.26 Which pesticide cannot be tank mixed with **Dursban Pro**?

_____.

6.P.27 **Dursban Pro** may be used to control ants, millipedes, and spiders in vegetable gardens.

T F

6.P.28 To make a 0.03% spray mixture of **Dursban Pro** to control millipedes outdoors, add 1 and 2/3 fluid ounces of formulation per gallon of water.

T F

6.P.29 **SAGA WP** forms a suspension when mixed with water.

T F

6.P.30 In case of an emergency spill of **Dursban Pro**, who should you call? Provide the phone number.

_____ _____

Agency/person Phone number

6.P.31 **Dursban Pro** has a higher potential health hazard than **SAGA WP**?

T F

6.P.32 The environmental hazards of **SAGA WP** and **Dursban Pro** to fish are identical.

T F

6.P.33 How soon after application of **SAGA WP** to indoor carpets can pets be allowed to enter the treated site?

_____

6.P.34 **SAGA WP** may be mixed with IGR's?

T F

6.P.35 **SAGA WP** may be used in commercial greenhouses or nurseries for Australian cockroach control?

T F

SECTION EXERCISE 6.W Wood-Destroying Organisms

To complete the following questions, refer to the **Dursban TC** and **Premise 75** pesticide labels.

6.W.1 While applying **Dursban TC** to a ventilated crawlspace, you must wear:

_____

_____

_____

_____

6.W.2 The active ingredient in **Dursban TC** and **Premise 75** are identical?

T F

6.W.3 **Dursban TC** can be used indoors for carpenter ant control?

T F

6.W.4 Structures that contain wells or cisterns must not be treated with **Premise 75**.

T F

6.W.5 Prior to installation of a finished grade on a preconstruction structure, application of **Dursban TC** or **Premise 75** at a lower dosage and/or concentration than specified on their respective labels is permitted.

T F

6.W.6 Hollow block foundations or voids of masonry can be treated with **Dursban TC** at a rate of 0.5 gallons per 10 linear feet.

T F

6.W.7 Adding 1 gallon of **Dursban TC** to 47 gallons of water yields a _____ dilution.

6.W.8 Adding 4 **Premise 75** packets to 50 gallons of water yields what concentration?

6.W.9 To establish vertical barriers, apply **Dursban TC** or Premise 75 at 4 gallons of dilution per 10 linear feet per foot of depth.

T F

6.W.10 What is considered by the **Dursban TC** label to be a "*post-construction application*"

_____

6.W.11 A one square foot bath trap will usually require about _____gallons of **Dursban TC** dilution for thorough and complete coverage.

6.W.12 People residing in the structure *during* application of **Dursban TC** must be advised to leave.

T F

6.W.13 The purpose of anti-back flow equipment is to:

_____

6.W.14 Under what conditions is an annual retreatment with **Dursban TC** and **Premise 75** allowed by their labels?

_____

6.W.15 Treatment drill holes in basement areas are required to be plugged following application of **Dursban TC** or **Premise 75**.

T F

6.W.16 Describe/explain a "plenum type structure"?

_____

6.W.17 Firewood may be directly treated with **Premise 75** for control of carpenter ants?

T F

6.W.18 **Premise 75** is labeled for control of powderpost beetles and old house borer?

T F

6.W.19 How many gallons of diluted **Dursban TC** or **Premise 75** is required to establish vertical barriers to the outside and inside foundations walls of a 30 ' X 50' existing structure where the footing is 12 inches deep?

_____

6.W.20 Using the above example, how much diluted **Dursban TC** or **Premise 75** is required where the footing is 24 inches deep?

_____

6.W.21 According to the **Dursban TC** label, this pesticide is extremely toxic to what type of organisms?

_____

6.W.22 After application of **Dursban TC** to an existing structure, what are you are required to do?

_____

6.W.23 To apply a post-construction termiticide treatment of Premise 75 under a concrete slab, what is the *recommended* spacing of the drill holes?

_____

6.W.24 List 2 (two) environmental conditions whereby the application of **Dursban TC** or **Premise 75** is prohibited?

_____

_____

6.W.25 Describe the proper spray tank mixing directions for **Dursban TC**.

a. _____

b. _____

c. _____

d. _____

e. _____

6.W.26 According to **Dursban TC** or **Premise 75** label, if soil will not accept the labeled application volume of 4 gallons termiticide/10 linear foot, such as a heavy, clay-type soil, what is recommended by the respective labels?

_____

_____

6.W.27 **Dursban TC** is :
a. termiticide
b. insecticide
c. pesticide
d. all the above

6.W.28 According to the **Dursban TC** label, how do you treat a shallow foundation of 1 foot or less?

_____

_____

_____

6.W.29 When rodding termiticide in hard, dry soils, very high pressure (50-100 psi) will force the termiticide into the soil and allow for good lateral dispersion.

T F

6.W.30 Give examples of "critical areas" of a structure when treating for subterranean termites?

_____

6.W.31 Provide an example of a "highly absorptive soil"?

_____

6.W.32 Which of the labels, **Dursban TC** or **Premise 75**, prohibits "use in voids insulated with rigid foam".

_____

6.W.33 Adding one **Premise 75** packet to 2.5 gallons of water in a foam generator will result in an expansion ratio of:

_____

6.W.34 Preconstruction subterranean termite treatments should be made after _____is completed and prior to the pouring of the _____?

6.W.35 To establish a horizontal preconstruction barrier treatment, the termiticide must be applied to soil at a rate of 1 gallon dilute termiticide per 10 square feet.

T F

Upon completion of each unit in the **Registered Technician Introductory Training Workbook**, the unit must be signed and dated by the designated trainer and the registered technician trainee.

When all units of the **Registered Technician Introductory Training Workbook** are completed by the registered technician trainee, the signature of the licensee at the end of Unit 8 will verify successful completion of the **Workbook**.

_____	_____
Registered Technician Trainee	**Date**
_____	_____
Designated Trainer	**Date**

Specimen Label

DowElanco

Dursban* Pro

Specialty Insecticide

*Trademark of DowElanco

To be applied only by or under the supervision of commercial applicators responsible for pest control programs

For control of various pests in and around residential and nonresidential buildings and structures, on various modes of transport, and on turf, ornamental plants, or fruit, nut, and citrus trees not grown for sale or commercial production.

Active Ingredient:
chlorpyrifos: 0,0-diethyl 0-(3,5,6-trichloro-2-pyridinyl) phosphorothioate. 23.5%
Inert Ingredients. 76.5%
Total. 100.0%

Contains 2.0 pounds of chiorpyrifos per gallon.

EPA Reg. No. 62719-166

Precautionary Statements

Hazards to Humans and Domestic Animals

Keep Out of Reach of Children

CAUTION PRECAUTION

Precaution al usuario: Si usted no lee ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

Harmful If Swallowed, Inhaled, Or Absorbed Through Skin

Avoid contact with eyes, skin or clothing. Avoid breathing vapors or spray mist. Wear eye protection. Handle concentrate in a ventilated area. Wear protective clothing when using or handling this product to help reduce exposure to eyes and skin. As a minimum, chemically resistant gloves and footwear, a long-sleeved shirt and long-legged pants or coveralls are recommended. Keep away from food, feedstuffs and water supplies. Wash thoroughly with soap and water after handling and before eating or smoking. Remove contaminated clothing and wash before reuse.

First Aid

If swallowed: Call a physician or Poison Control Center immediately. Do not induce vomiting. Do not put anything into the mouth of an unconscious person.
If on skin: Wash exposed area with plenty of soap and water. Get medical attention.
If in eyes: Flush eyes with plenty of water for 15 minutes. Get medical attention.
If inhaled: Remove person to fresh air and if not breathing give artificial respiration, preferably by mouth to mouth. Get medical attention.
Note to physician: Chlorpyrifos is a cholinesterase inhibitor. Treat symptomatically. If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). Atropine, only by injection, is the preferable antidote. Oximes, such as 2-PAM/protopam, may be therapeutic if used early; however, use only in conjunction with atropine. In case of severe acute poisoning, use antidote immediately after establishing an open airway and respiration.

Environmental Hazards

This pesticide is toxic to birds and wildlife and extremely toxic to fish and aquatic organisms. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent aquatic sites. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters. Cover or contain spills outdoors and dispose of in a manner consistent with local, state, and federal regulations.

Notice: Read the entire label. Use only according to label directions. **Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" elsewhere on this label.**

In case of emergency endangering health or the environment involving this product, call collect 517-636-4400.
Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
Read all Directions for Use carefully before applying.

Do not formulate this product into other end-use products.

Not for use on plants grown for sale or other commercial use, or for commercial seed production, or for research purposes. For use on plants intended for aesthetic purposes or climatic modification and being grown in interior plantscapes, ornamental gardens or parks, or on golf courses or lawns and grounds.

Storage and Disposal

Do not contaminate water, food or feed by storage or disposal.
Storage: Store in original container in secured dry storage area. Prevent cross-contamination with other pesticides or fertilizers. Do not store above 122°F for extended periods of time. Preferred storage is above 32°F. Storage below 32°F may result in solidification. If warmed to above 32°F, product will return to original form. Freezing does not adversely affect this product. If container is damaged or spill occurs, use product immediately or dispose of product and damaged container as indicated below.
Storage for Dilutions: Dilutions of Dursban Pro are sensitive to crystal formations when exposed to freezing, or near freezing temperatures, e.g. temperatures below 35°F, for extended periods of time. Therefore, dilutions allowed to stand overnight should be stored at temperatures above 4°F.
Pesticide Disposal: Excess pesticide resulting from the use of this product may be disposed of on site according to label directions or at an approved waste disposal facility.
Container Disposal: Do not reuse empty container. Triple rinse, wrap container and put in trash.

General Information

Dursban* Pro insecticide is an emulsifiable concentrate designed for use as a spray to control various pests in and around residential and nonresidential buildings and structures, on various modes of transport, and on turf, ornamental plants, and fruit, nut, and citrus trees not grown for sale or commercial production.

General Pest Control - Indoors

Directions for General Use Indoors

Dursban Pro is intended to be mixed with water and applied as crack and crevice and spot, treatments with pressurized sprayers or other equipment suitable for applying insecticides to localized areas. The active ingredient in this product can provide effective residual control of pests listed on this label. To minimize airborne particles spray pressure should not exceed 30 psi at the nozzle tip.

Handling Procedures for General Use Indoors
Adults, children or pets should not contact treated surfaces until spray has dried.
Before spraying, remove pets and cover aquariams i.e., fish bowls, and turn off air pump.
Do not apply where electrical short circuits could occur.
Do not use indoors as a space spray or in fogging equipment.
To avoid breathing spray mist during application in confined areas, wear a mask or respirator of a type recommended by NIOSH for filtering spray mists.

It is recommended that eye protection be worn when making applications overhead.

Treatment Sites
When used in accordance to label directions Dursban Pro may be applied in and around residential and nonresidential buildings and structures including residential kitchens and all types of food handling establishments and vehicles. This product can be applied to walls, floors, ceilings, in and around cabinets, between, behind and beneath equipment and appliances, around floor drains, window and door frames, around plumbing, sinks and other possible pest harborage sites. Permitted areas of use include but are not limited to:

apartment buildings
bakeries
bottling facilities
breweries
cafeterias
crawl spaces
food manufacturing plants
food processing plants
food service establishments
granaries and grain mills
hospitals
hotels
houses
industrial buildings
kitchens
laboratories
mausoleums
mobile and motor homes
offices
restaurants
schools
stores
warehouses
wineries
vehicles

Dosage Rates
Applications of 0.25% to 0.5% Dursban Pro can be made depending on pest species and conditions of premises. See “Specific Indoor Use Directions” for additional information.

Mixing Directions
To make a 0.25% water based spray mix 1 1/3 fl oz of Dursban Pro per each gallon of spray. To make a 0.5% water based spray mix 2 2/3 fl oz of Dursban Pro per each gallon of spray. A stable emulsion of Dursban Pro can be formed by first adding approximately one-half the water to a spray tank followed by adding the proper amount of Dursban Pro. Close the tank and shake vigorously for 5 to 10 seconds. To avoid excess foam, slowly add the remaining water.

Tank Mixing: Unless prohibited by a product’s label, users, at their own discretion, can tank mix pesticides currently labeled for similar use patterns. It is always recommended that a small jar compatibility test using proper proportions of chemicals and water be run to check for physical compatibility prior to tank mixing. **Do not** tank mix this product with products containing dichlorvos (DDVP).

Application Methods
This product may be applied indoors as crack and crevice and spot, treatments. Treat where pests are found or normally occur. Except as noted under “Food Handling Establishments”, applications can be made in 7 day intervals. If necessary, Dursban Pro may be applied after 2 days from last treatment (call back treatments), but such use should be limited to once per month.

Crack and Crevice Applications
Use a low pressure system with a pinpoint or variable pattern nozzle to apply the spray mixture to areas such as: floors, cracks, and crevices in and around baseboards, walls, expansion joints, areas around water and sewer pipes, and voids formed by equipment or appliances.

Spot Applications
Use a low pressure system with fan type nozzle to uniformly apply spot treatments in and around cupboards and between, beneath and behind equipment or appliances. Dursban Pro may be applied as a spot treatment for control of ticks and carpet beetles.

Note: Thoroughly ventilating treated areas following treatments can reduce potential odors and speed drying. Ventilation in buildings with closed air circulating systems can be improved by adjusting ventilation systems to include outside air.

Cabinet Interiors: When treating interiors of cabinets containing food or food utensils, remove or otherwise protect such items from contact with spray. Allow spray to dry before returning food or food utensils to treated cabinets. Prevent the above items from directly contacting treated surfaces. Shelf liners or similar material can provide adequate protection from treated surfaces. Thoroughly wash dishes, food utensils or food-contacting surfaces with soap and water if they are directly exposed to this product.

Food Handling Establishments: Dursban Pro maybe applied in both food and nonfood areas of all types of food-handling establishments, i.e. food service, food processing and food manufacturing establishments. This includes, but is not limited to, restaurants, grocery stores, bakeries, bottling plants, canneries, and grain mills. See “Treatment Sites” for a more complete but not exhaustive listing.

Note: Applications of this product within food handling areas are limited to spot and crack and crevice treatments. Applications can be applied in 7 day intervals in restaurants and similar food service establishments and applied in 14 day internals in other types of food handling establishments. If necessary, Dursban Pro may be applied after 2 days from last treatment (call back treatments), but such use should be limited to once per month.

Indoor Pests Controlled by Dursban Pro

Ants (1)	Firebrats
Beetles	Fleas
Boxelder bugs	Flour beetles
(or other true bugs)	(Confused)
Brown dog ticks (2)	(Red)
Carpet beetles (3)	(Sawtoothed)
Centipedes	Indian meal moths
Clover mites	Mediterranean flour moths
Cockroaches (4)	Millipedes
(American)	Rice weevils
(Asian)	Silverfish
(Brownbanded)	Scorpions
(German)	Sowbugs
(Oriental)	Spiders
(Smokybrown)	Ticks
Crickets	and other insect pests
Earwigs	

Numbers refer to "Specific Indoor Use Directions".

Specific Indoor Use Directions

1. **Ants** may be controlled by treating ant trails and wherever else these pests may find entrance; for example, around doors and windows.
2. For the control of **brown dog ticks,** thoroughly apply the spray to infested areas, such as cracks and crevices, along baseboards, windows and door frames, and areas of floor and floor coverings where these pests may be present. Old bedding should be replaced or thoroughly washed. Use a 0.5% spray. **DO NOT TREAT PETS WITH THIS PRODUCT. Humans or pets should not contact treated surfaces for a minimum of 4 hours and until the spray has dried.**
3. For the control of **carpet beetles,** thoroughly apply the spray to rugs, carpets, along baseboards and edges of carpeting, under carpeting, rugs and furniture, in closets and on shelving, and wherever else these insects are seen or suspected, Use a 0.5% spray. **Humans or pets should not contact treated surfaces for a minimum of 4 hours and until spray has dried.**
4. **Cockroaches** can be controlled by making crack and crevice, and spot treatments. Treat where insects are found or normally occur including, but not limited to floors, cracks and crevices in walls, along and behind baseboards, around plumbing, floor drains and other utility installations, beneath and behind sinks, cabinets or other fixtures. Applications within food handling areas are limited to spot and crack and crevice treatments.

General Pest Control - Perimeter Treatments

Directions for Perimeter Treatments
Dursban Pro is intended to be mixed with water and applied outdoors with pressurized sprayers as a general surface spray.

Handling Procedures for Perimeter Treatments
Adults, children or pets should not contact treated sufraces until spray has dried.
Keep out of fish pools and other bodies of water.
Do not treat vegetable gardens.
Do not allow livestock to graze in treated areas.
Do not feed treated grass cuttings (hay) or seed screenings to livestock, nor use treated hay for livestock bedding.

Treatment Sites
When used in accordance to label directions Dursban Pro maybe applied to and around outside surfaces of residential and nonresidential buildings and structures. Permitted areas of use include but are not limited to:

crawl spaces	garages
decks	patios
driveways	refuse dumps
eaves	walkways
fences	walls
foundations	window and door frames

Note: Phytotoxicity: Environmental factors and varietal differences may affect phytotoxic expression. In situations where phytotoxicity potential is of concern, it is recommended that a small group of plants be sprayed and observed for 7 to 10 days to determine phytotoxic potential before treating large numbers of those plants.

Dosage Rates
Applications of 0.03% to 0.5% Dursban Pro can be made depending on pest species and method of application. See "Application Methods" for additional information.

Mixing Directions
To make a 0.03% water based spray, add 1 2/3 fl oz Dursban Pro per 10 gallons of spray. To make a 0.5% water based spray add 2 2/3 fl oz Dursban Pro per each gallon of spray.

A stable emulsion of Dursban Pro can be formed by first adding approximately one-half the water to the spray tank followed by adding the proper amount of Dursban Pro. Close the tank and agitate for 5 to 10 seconds. Add remaining water slowly to avoid excess foam.

Tank Mixing
Unless prohibited by a product's label, users, at their own discretion, can tank mix pesticides currently labeled for similar use patterns. It is always recommended that a small jar compatibility test using proper proportions of chemicals and water be run to check for physical compatibility prior to tank mixing. **Do not** tank mix this product with products containing dichlorvos (DDVP).

Application Methods
This product may be applied outdoors as a general surface spray, Treat where pests are found or normally occur.

Low Volume Directed Sprays
Application of low volume, high concentration (about 0.5%) sprays can quickly reduce localized heavy pest infestations on outside surfaces. Use a low pressure system with a pinpoint or variable pattern nozzle, such as a 1 gallon hand pump sprayer, and apply the spray mixture to specific areas such as cracks and crevices along walkways, patios, windows and door frames or other areas where insects may congregate or can gain entrance to the structure.

High Volume Broadcast Sprays
Application of high volume, low concentration (0.03% - 0.12%) sprays, such as with power spraying equipment, can help prevent infestation of buildings by reducing pests in outdoor areas. Longer residual is achieved at the higher rates (about 0.12%). To make a 0.03% water based spray, mix 8 fl oz of Dursban Pro per 50 gallons. To make a 0.12% dilution, mix 32 fl oz of Dursban Pro per 50 gallons of water. This type of treatment provides more thorough coverage over large areas than low volume directed sprays. Treat by applying spray mixture directly to areas such as junctions of soil and structural walls, along base of fences, and under eaves. Apply as a coarse spray at the rate of about 10 gallons spray mixture per 1000 square feet. Thoroughly and uniformly wet the treated area.

Pests Controlled by Perimeter Treatments of Dursban Pro

Ants
Bees
Beetles
Boxelder bugs
(or other true bugs)
Carpenter ants
Centipedes
Clover mites
Cockroaches
(American)
(Asian)
(Brownbanded)
(German)
(Oriental)
(Smokybrown)
Crickets
Earwigs
Elm leaf beetles
(adults)
Fire ants (1)
Fleas
Files
Hornets
Millipedes
Mosquitoes
Pillbugs
Scorpions (2)
Sowbugs
Spiders
Springtails
Ticks
Wasps
Yellowjackets
and other outdoor insects

Numbers refer to "Specific Outdoor Use Directions".

Specific Use Directions for Perimeter Treatments

1. **Fire ant mounds** may be controlled by applying Dursban Pro as a drench. Dilute 2 fl oz per 4 gallons of water. Gently sprinkle 1 to 2 gallons of the diluted insecticide over the surface of each mound and surrounding areas to a 2 foot diameter. For best results, apply in cool weather, 65 to 80°F, or in early morning or late evening hours. Treat new mounds as they appear. Pressurized sprays may disturb the ants and cause migration, reducing product effectiveness.
2. **Scorpions** may be controlled by removing accumulations of lumber, firewood and other materials serving as harborage sites. Before stacking firewood or lumber, apply Dursban Pro as a localized spray to surfaces immediately below such materials. Broadcast sprays outdoors may assist in reducing pests migrating from surrounding areas.

General Control of Wood - Infesting Insects

Directions for General Use to Control Wood-Infesting Insects
Dursban Pro is intended to be mixed with water and applied as a general surface or localized injection treatment with pressurized sprayers or other equipment suitable for applying insecticides to localized areas.

Handling Procedures to Control Wood-Infesting Insects
Contact with treated surfaces should be avoided until spray has dried.

Cover or remove exposed foods before treatment.

Before spraying remove pets and cover aquariams, i.e., fishbowls and turn off air pump.

Do not apply where electrical short circuits could occur.

Do not use in structures housing animals which are intended for or which produce products to be used for food purposes, i.e. poultry houses.

Thoroughly ventilating treated areas following broadcast treatments can reduce potential odors and speed drying. Ventilation in buildings with closed air circulating systems can be improved by adjusting ventilation systems to include outside air.

Treatment Sites
When used in accordance to label directions Dursban Pro can be applied to residential and nonresidential buildings and structures for control of wood-infesting insects. Permitted areas of use include but are not limited to:

wood surfaces
voids and channels in damaged wood
gaps between wooden members
wall voids
junctions between wood and foundation

Dosage Rates
Applications of 0.5% to 1.0% Dursban Pro can be made depending on pest species and method of application. Expect increased residual control at higher rates. See "Specific Use Directions For Control of Wood-infesting Insects" for additional information.

Mixing Directions
To make a 0.5% water based spray mix 2 2/3 fl oz of Dursban Pro per each gallon of spray mixture. To make a 1.0% water based spray mix 5 1/3 fl oz of Dursban Pro per each gallon of spray mixture.

A stable emulsion of Dursban Pro can be formed by first adding approximately one-half the water to a spray tank followed by adding the proper amount of Dursban Pro. Close the tank and shake vigorously for 5 to 10 seconds. To avoid excess foam, slowly add the remaining water.

Tank Mixing
Unless prohibited by a products label, users at their own discretion, can tank mix pesticides currently labeled for similar use patterns. It is always recommended that a small jar compatibility test using proper proportions of chemicals and water be run to check for physical compatibility prior to tank mixing. **Do not** tank mix this product with products containing dichlorvos (DDVP).

Application Methods
This product may be applied either as a coarse spray or by brushing onto targeted surfaces. Equipment capable of delivering a coarse, low pressure (about 20 psi) spray is recommended for treatment of large or overhead areas. Inaccessible areas such as wall voids can be treated by injecting the spray mixture under low pressure (about 20 psi) through drilled openings. Use sufficient amount of spray dilution to cover the area to the point of wetness but avoid applying to the point of runoff.

Overhead Areas
It is recommended that, when spraying overhead interior living areas of residential buildings, surfaces below areas being treated be covered with plastic sheeting or other material which could be disposed of by placing in trash.

Wood-infesting Insects Controlled by Dursban Pro

Beetles (1)
(Anobiidae)
(Bostrichidae)
(Cerambycidae)
(Lyctidae)
Carpenter ants and other wood-infesting ants (2)
Carpenter bees
Termites (3)

Numbers refer to "Specific Use Directions for Control of Wood-Infesting Insects".

Specific Use Directions for Control of Wood-Infesting Insects

1. **Beetles** may be controlled by applying spray mixture to infested areas, or areas where infestations are likely to occur. This includes but is not limited to wood surfaces, voids, and channels in damaged wood, in spaces between wooden members of a structure, and junctions between wood and foundations. Use the following guidelines to determine appropriate rates of application:

   New Wood, (typically less than 10 years of age) apply at about 1 gallon of dilution per 150 square feet.

   Old Wood, (typically greater than 10 years of age) apply at about 1 gallon of dilution per 100 square feet.

2. **Wood-Infesting ants** may be controlled by applying spray mixture around doors and windows, cracks or crevices, or other areas where ants may enter, crawl, or hide.

   Primary colonies are typically found outside through an exterior inspection. Correction of sanitation and structural deficiencies or landscape modifications may be necessary for effective control.

3. **Termites** can be treated by applying spray mixture to infested areas, or areas where infestations are likely to occur. This includes but is not limited to wood surfaces, voids and channels in damaged wood, in spaces between wooden members of a structure, and junctions between wood and foundations.

   This treatment is intended to kill localized infestations of workers and winged reproductive forms of termites and to prevent infestation for a temporary period. This application is not intended as a substitute for soil treatments.

General Pest Control - Turf, Ornamental, and Fruit, Nut, and Citrus Trees

General Information

Dursban Pro is an emulsifiable concentrate for use to control pests injurious to turf, ornamental, and fruit, nut, and citrus trees. The pests controlled are listed in the accompanying tables. Dursban Pro is compatible with insecticides, miticides and fungicides commonly recommended except for alkaline materials such as Bordeaux mixture and lime. A small amount of spray mixture should be prepared to check for compatibility before a large volume of spray is mixed.

Handling Procedures:

Adults, children or pets should not contact treated surfaces until the spray has dried.
Keep out of fish pools and other bodies of water.
Do not treat vegetable gardens.
Do not allow livestock to graze in treated areas,
Do not feed treated grass cuttings (hay) or seed screenings to livestock nor use hay for livestock bedding.
Chemigation: do not apply this product through any type of irrigation system.
Fruit, nut, and citrus trees: see precautionary statements and restrictions in this section of the label.
It is always recommended that a small jar compatibility test using proper proportions of chemicals and water be run to check for physical compatibility prior to tank mixing.

Turf and Other Outdoor Uses

Use Dursban Pro to control the pests listed in the following table by application at the recommended dosages. Dilute Dursban Pro in water and apply using suitable application equipment. For best results, turf should be moist at time of treatment.

Pest	Amount of Dursban Pro per	
	1000 Sq. ft.	Acre
Ants Armyworms (Such as: Beet, Fall, Yellowstriped) Centipedes Chiggers (1) Chinch bugs Crickets Cutworms Deer ticks (2) Earwigs European crane fly larvae Fiery skipper Fire ants (foraging workers) Fire ants (mounds) (3) Fleas Gnats Grasshoppers Greenbug aphids Green June beetle grubs Leafhoppers Lucerne moth Millipedes Mites (Such as: Clover, Bermudagrass stunt, Winter grain) Mosquitoes (4) Pillbugs Sod webworms (lawn moths) (5) Sowbugs Ticks (1)	1 1/2 fl oz	2 qt
Billbug adults (Such as: Bluegrass, Denver, Hunting) (6)	1 1/2-3 fl oz	2 - 4 q t
Annual bluegrass weevil *(Hyperodes)* (7) Black turfgrass ataenius adults (8) Mole crickets (9)	3 fl oz	4 qt
Mole crickets (1 O)	3-4 1/2 fl oz	4 - 6 q t
White grubs (Such as: Black turfgrass ataenius, European chafer, Japanese beetle larvae, and Northern and Southern masked chafers) (11)	3-6 fl oz	4 - 8 q t

Specific Directions:

1. Use Dursban Pro for area control of **ticks** and **chiggers** infesting non-cropland areas such as turf and grassy areas, roadsides, footpaths and trails, picnic and camping sites, parks and other recreational areas where these pests are present and create a nuisance or a possible public health problem. Do not allow public use of treated areas during application or until spray has dried. Apply Dursban Pro insecticide in water at the rate of 1 pint per acre (1/3 fl oz per 1000 sq. ft.) using a hydraulic sprayer, mist applicator, backpack sprayer, or other suitable hand or power operated spray equipment.
2. For control of **deer ticks** apply Dursban Pro in water at the rate of 2 quarts per acre or 1 1/2 fl oz per 1000 square feet. Treat low underbrush, turf, grassy areas, weeds, and ground surface and debris, using enough spray volume to obtain thorough coverage.
3. For individual **fire ant mounds** apply Dursban Pro as a drench. Dilute 2 fl oz per 4 gallons of water. Gently sprinkle 1 to 2 gallons of the diluted insecticide over the surface of each mound and surrounding areas to a 2 foot diameter. For best results, apply in cool weather, 65-80°F, or in early morning or late evening hours. Treat new mounds as they appear. Pressurized sprays may disturb the ants and cause migration, reducing product effectiveness.
4. **Mosquitoes** coming to rest on areas treated for control of turf pests will be controlled for varying periods of time after treatment depending on exposure of treated areas to weathering conditions.

5. For **sod webworms,** watering or mowing of the treated area should be delayed for 12 to 24 hours after treatment.
6. For **billbugs,** spray early in the season just prior to, or coinciding with first appearance of adults as recommended by your local Agricultural Extension Service Specialist.
7. To control **annual bluegrass weevil,** spray suspected problem areas in mid-April and again in Mid-May, or as recommended by your local Agricultural Extension Semite specialist.
8. For **black turfgrass ataenius** adults, spray early in the season as recommended by your local Agricultural Extension Service Specialist. A repeat application maybe needed 1 to 2 weeks later.
9. To control **mole crickets** in turfgrass, apply Dursban Pro through high pressure injection or other suitable subsurface placement application equipment. Depending on the application equipment used, follow the manufacturer's recommendation for calibration and the volume of spray per acre needed to provide control or as recommended by your local Agricultural Extension Service Specialist. For best results, apply when young nymphs are active.
10. To control **mole crickets** in turfgrass, apply Dursban Pro using broadcast or suitable hand-held application equipment. Application should be in a minimum of 50 gallons of water per acre. Turf must be irrigated within 24 hours after treatment to wash the insecticide into the area of insect activity. Apply when early stage nymphs are active. Effectiveness may be enhanced by spraying late in the afternoon or early evening and irrigating the turf within 24 hours prior to and following application to move mole crickets near the soil surface and wash the insecticide into the zone of insect activity.
11. For **white grubs,** spray when grubs are young and actively feeding near the soil surface, usually during late July and August or as recommended by your local Agricultural Extension Service specialist. For best results, soil should be moist prior to treatment. **For best results, immediately after spraying, irrigate the treated area with 1/2 to 1 inch of water to wash the insecticide deep into the thatch or underlying soil.**

Ornamental (Outdoor)

Use Dursban Pro to treat flowers, shrubs, evergreens, vines, shade and flowering trees, and non-bearing fruit trees found to be infested with the types of pests listed in the following tables. Dilute Dursban Pro with water according to directions given in the tables and apply using suitable hand or power-operated spray equipment in a manner to provide complete and uniform coverage. Attempt to penetrate dense foliage, but avoid over-spraying to the point of excessive runoff. Uniform coverage is critical for effective insect and mite control.

Consult your State Agricultural Experiment Station or Extension Service specialist for application timing and other specific use information

Note: Phytotoxicity: Environmental factors and varietal differences may affect phytotoxic expression. In situations where phytotoxicity potential is of concern, it is recommended that a small group of plants be sprayed and observed for 7 to 10 days to determine phytotoxic potential before treating large numbers of those plants.

Sucking Insects and Mites

Pest	Amount of Dursban Pro per 1 gallon	100 gallons
Adelgids (Such as: Cooley and Eastern spruce galls, Pine bark) Aphids (Such as: Apple, Balsam twig, Black pecan, Chrysanthemum, Cottonwood, Crape myrtle, Elm leaf, Melon, Peach, Rose, Spirea, White pine, Woolly, Woolly apple, Yellow pecan) Boxelder bugs Lace bugs (Such as: Hawthorn) Periodical cicada Plant bugs Psyllids Spittlebugs Thornbug Whiteflies	1/6 - 1/3 fl oz	1 p t - 1 q t
Leafhoppers Mealybugs (Such as: Citrus, Taxus) Mites (Such as: Clover, Red spider, Spruce spider, Southern red, Twospotted spider) (1) Thrips (exposed)	1/3 fl oz	1 qt
Scale insects (Such as: Cottony cushion, Cottony maple, Dearness, Euonymus, Fletcher, Florida wax, Golden oak, Hemispherical, Lecanium, Magnolia, Oak kermes, Oak lecanium, Oystershell, Pine needle, San Jose, Tea, White birch) (2)	2/3 fl oz	2 qt

Specific Directions:

1. For effective control of **spider mites** when large numbers of eggs are present, apply a second spray 3 to 5 days in the South or 7 to 10 days in the North after initial treatment to control newly hatched nymphs.
2. Time applications for control of **scale insects** when crawlers or first two stages of settled nymphs are present.

Defoliators and Leafminers

Pest		Amount of Dursban Pro per 1 gallon	Amount of Dursban Pro per 100 gallons
Armyworms (Such as: Fall, Yellowstriped) Bagworms (1) Cankerworms Catalpa sphinx Elm spanworms Fall webworms (2) Grasshoppers Greenstriped mapleworms Green fruitworms Hornworms Jackpine budworms Juniper webworms Katydids Leaf rollers (3) Maple leafcutters (4) Oak skeletonizes	Oleander caterpillars Orange tortrix Poplar tentmaker Puss caterpillars Rose chafers Sawflies, exposed (Such as: European pine, Pine, Pin oak, Redheaded) Spring elm caterpillars Springtails Spruce budworms (Such as: Eastern, Western) Tent caterpillars (Such as: Eastern, Forest, Western) Walnut caterpillars Yellownecked caterpillars	1/6 - 1/3 fl oz	1 p t - 1 q t
Balsam gall midge Beet armyworms Beetles (Such as: Fuller rose) (5) Browntail moth Cutworms Cypress tip moth Douglas-fir tussock moth European pine shoot moth Gypsy moth (6) Holly bud moth	Mahogany webworms Mimosa webworms Nantucket pine tip moth Oakworms (Such as: California, Orangestriped, Redhumped) Pandora moth Pitch pine tip moth Redhumped caterpillars Subtropical pine tip moth Tussock moth	1/3 fl oz	1 qt
Beetles (Such as: Cottonwood leaf (7), Elm leaf, Flea, Willow leaf)		1/3 - 2/3 fl oz	1 - 2 q t
Leafminers Needleminers (Such as: Jeffrey pine, Lodgepole pine, Spruce) Pine needle midge Rhododendron gall midge		2/3 fl oz	2 qt

Specific Directions:

1. For **bagworms,** treat when larvae are small and actively feeding.
2. For effective control of **fall webworms,** direct spray into web and immediately surrounding foliage.
3. For effective control of **leafrollers,** spray should be applied before leaves are tightly rolled.
4. For **maple leafcutter** on maple trees, apply spray to larvae as cases are being formed. Do not treat sugar maple trees intended for maple syrup production.
5. To reduce foliar feeding on twigs and branches by **beetles,** applications should be made in the spring or early summer.
6. To control migrating and invading **gypsy moth** larvae, treat trunks and foliage.
7. For **cottonwood leaf beetles,** spray larvae and adults infesting cottonwoods. Applications should be made when damaging beetle populations are developing or present.

Borers, Bark Beetles, and Weevils

Pest	Amount of Dursban Pro 1 gallon	Amount of Dursban Pro 100 gallons
Weevils (Such as: Black vine (1), Cranberry girdler (2), Pine reproduction, Yellow poplar)	1/3 fl oz	1 qt
Borers: Clearwing moths (Such as: Ash, Dogwood, Lesser peachtree, Lilac, Oak, Peachtree, Rhododendron), Longhorned beetles (Such as: Cottonwood, Locust, Red oak), Metallic wood (Such as: Bronze birch, Fatheaded appletree, Twolined chestnut) (3) Pales weevil adults Zimmerman pine moth	2/3 fl oz	2 qt
Northern pine weevil (4) Pales weevil (4)	2 fl oz	6 qt
Beetles (5); (Such as: Ambrosia, Anobiidae, Black turpentine, Blister, Cottonwood leaf, Elm leaf, European elm bark, Fuller rose, Japanese, June, Mountain pine, Native elm bark (6), Southern pine, Spruce, Western pine, Willow leaf)	5 1/3 fl oz	4 gal
Weevils (Such as: Northern pine, Pitch eating, Twig) (7)	10 2/3 fl oz	8 gal

Specific Directions:

1. **Black vine weevils** are night feeders. Late afternoon spraying will maximize control.
2. For **cranberry girdler** larvae infesting Douglas-fir seedlings, direct spray at lower crown and stems following egg laying during summer and irrigate immediately after application to move the insecticide into the top 1 to 2 inches of soil.
3. For **borers,** spray trunks and lower limbs of trees and shrubs when adults begin to emerge. For **peachtree borers,** spray flowering trees and shrubs of the genus *Prunus* as a trunk spray before newly-hatched larvae enter the trees and thoroughly wet all bark areas from ground level to scaffold limbs. Pheromone traps may aid in detection of adult cleaning moths. Consult your State Agricultural Experiment Station or Extension Service specialist for proper time to treat.
4. For control of **northern pine and pales weevil** larvae, apply as a cut stump spray or drench in winter or early spring.
5. For **preventive treatment,** spray the main **trunk** of trees in the early spring or when threat of attack exists from nearby infested trees. For **remedial treatment,** spray the main trunk of infested trees or logs before adult beetles begin to emerge.

6. To prevent native **elm bark beetles** from over-wintering in uninfested trees, apply using a dilution of 2 gal per 100 gallons of water (2 2/3 fl oz per gallon) as a spray to the bottom 9 feet of trunk. Wet the trunk thoroughly but do not spray to runoff. Care should be taken to apply the spray right to the base of the root flare. Applications can be made from spring to early fall. To reduce twig and branch feeding on trees deemed to be of high value, apply as a spray to the tree crown using a dilution of 2 gal per 100 gallons of water (2 2/3 fl oz per gallon). Applications should be made in the spring or early summer using a sprayer that will give thorough coverage to the tree crown.
7. For pine seedlings, treat immediately after transplanting, Treat each seedling with enough spray to thoroughly wet the foliage and stem to the point of runoff.

Ants, Termites. and Miscellaneous Pests

Pest	Amount of Dursban Pro per 1 gallon	Amount of Dursban Pro per 100 gallons
Ants Cockroaches (Such as: American, Asian, Brownbanded, German, Oriental, Smokybrown, Wood) Fire ants (foraging workers) Fire ants (mounds) (1) Sowbugs Springtails	1/3 fl oz	1 qt
Carpenter ants (2) Termites	5 1/3 fl oz	4 gal

Specific Directions:
1. For individual **fire ant mounds** apply Dursban Pro as a drench. Dilute 2 fl oz per 4 gallons of water. Gently sprinkle 1 to 2 gallons of the diluted insecticide over the surface of each mound and surrounding areas to a 2 foot diameter. For best results, apply in cool weather, 65-80°F, or in early morning or late evening hours. Treat new mounds as they appear. Pressurized sprays may disturb the ants and cause migration, reducing product effectiveness.
2. If possible, locate carpenter ant nests and drench thoroughly.

Ornamental (Dormant Spray of Tree Pests)

Use Dursban Pro as a dormant or delayed dormant spray at the rates indicated to control the listed insects. While Dursban Pro may be used without oil, oil is recommended to control additional pests such as European red mite.

For high volume (dilute) sprays (200 to 600 gallons of spray mixture per acre), tank mix the specified dosage with 1 to 2 gallons of a petroleum spray oil recommended for dormant use in 100 gallons of water. Spray the entire tree to runoff using suitable ground spray equipment.

For low volume (concentrate) sprays (less than 200 gallons of spray mixture per acre), use the same amount of Dursban Pro as for a dilute spray and apply in a manner that will ensure thorough coverage of the trees. Use oil as recommended by your State Agricultural Experiment Station or Extension Service Specialist.

Precautions: Because cold dry conditions may cause Dursban Pro plus oil to infuse trees resulting in bud damage or drop, do not apply until winter rains or irrigation has replenished soil moisture such that bark and twigs are not desiccated.

Restrictions: Make only one application during the dormant season. Do not allow meat or dairy animals to graze in treated areas.

Pest	Amount of 1 gallon	Dursban Pro per 100 gallons
Aphids (Such as: Mealy plum, Rosy apple, Woolly apple) Borers (Such as: Peach twig) Cutworms (Such as: Climbing) Leaf rollers (Such as: Obliquebanded, Pandemis) Pear psylla adults Scale insects (Such as: San Jose)	1/6 - 1/3 fl oz	1 pt - 1 qt

Fruit, Nut, and Citrus Trees

Use Dursban Pro to treat **almond, apple, cherry, filberts, nectarine, peach, pecan, walnut** and **citrus trees or tree fruit** (such as: **grapefruit, lemon, orange)** not grown for commercial consumption of fruit by spraying to the point of runoff. When treating citrus trees only, a petroleum spray oil recommended for use on **citrus trees** maybe added to spray mixtures only at rates of up to 1.8 gallons per 100 gallons of water to improve control of aphids, mealybugs, scale insects and thrips. Treat when insects become a problem or in accordance with the local spray schedule recommended by your State Extension Service Specialist.

Precautions: Do not apply as a foliar spray to **sweet cherries** because contact of spray solution with leaves may result in premature leaf drop. Observe local use directions for tank mix combinations especially with applications of Dursban Pro plus spray oil. Do not apply Dursban Pro in combination with oil to **walnuts.** Dry or cold conditions may cause Dursban Pro plus oil to infuse trees resulting in bud damage or drop; do not apply until winter rains or irrigation has replenished soil moisture such that bark and twigs are not desiccated. Do not apply when trees are stressed by drought.

Restrictions:
Almonds, Filberts, Walnuts: Make only one dormant/delayed dormant spray application and no more than three foliar spray applications on **almonds** per season, one dormant/delayed dormant spray application and no more than two foliar spray applications on**walnuts** per season, and no more than three foliar spray applications on **filberts** per season. Do not apply within 14 days of harvest.
Apples: Rate applied must not exceed 23 fl oz per gallon or 2 qt per 100 gallons. Make no more than 8 applications per season. Do not apply last treatment within 28 days before harvest or apply last two treatments closer than 21 days apart.
Citrus (Such as: Grapefruit, Lemon, Orange): Rate applied must not exceed 1/3 fl oz per gallon or 1 qt per 100 gallons. Do not apply to flowering trees. Do not apply when temperature exceeds 95°F. Do not apply more than 2 applications per fruit year. Do not make a second application within 30 days of the first application. Do not pick fruit for consumption until 21 days after application.
Nectarines, Peaches (trunk sprays only): Do not allow spray to contact fruit. Make only one application per season. Do not apply within 14 days of harvest.
Pecans: Rate applied must not exceed 2/3 fl oz per gallon or 2 qt per 100 gallons. Make no more than 5 applications per season. Do not apply within 28 days of harvest.
Sour cherries: Make no more than 8 applications per season. Do not apply within 14 days of harvest.
Sweat cherries (trunk and lower limb sprays only): Rate applied must not exceed 2/3 fl oz per gallon or 2 qt per 100 gallons, Avoid spray contact with foliage (leaves) since premature leaf drop may result. Make only three applications per year. Do not apply within 6 days of harvest.

Pest	Amount of Dursban Pro per 1 gallon	Amount of Dursban Pro per 100 gallons
Aphids (Such as: Apple, Black cherry, Black pecan, Filbert, Rosy apple, Woolly apple, Yellow pecan) Apple Maggot Borers (Such as: American plum, Dogwood, Lesser peachtree, Pacific fatheaded, Peach twig, Peachtree, Shothole) Cherry fruit fly Climbing cutworm Codling Moth European apple sawfly European corn borer Eyespotted bud moth Fall webworm Filbert worm Grasshoppers (Such as: Lubber) (1) Green fruitworm Hickory shuckworm Katydids Leaf rollers and tiers (Such as: Avocado leafroller, Filbert leafroller, Fruittree leafroller, Obliquebanded leafroller, Omnivorous leaftier, Orange tortrix, Pandemis leafroller, Redbanded leafroller, Variegated leafroller) Lepidopterous larvae Lesser appleworm Lygus sp. Mealybugs Mineola Moth Mites (Such as: Citrus rust, European red, Pecan leaf scorch, Twospotted spider) (2) Navel orangeworm Oriental fruit moth Pecan nut casebearer Pecan weevil Periodical cicada *Phylloxera* sp. Plum curculio Potato leafhopper Rose chafer Scale insects (Such as: European fruit lecanium, San Jose, Walnut) Spittlebug Spotted tentiform leafminer Stinkbug Tarnished plant bug Thrips (Such as: Citrus) Tufted apple budmoth Walnut husk fly Western tussock moth White apple leafhopper Winter moth	1/3 - 2/3 fl oz†	1 - 2 q t†
Scale insects (Such as: Black scale, Brown soft scale, California red scale, Chaff scale, Florida red scale, Long scale, Purple scale, Snow scale)	2/3- 1 1/3 fl oz†	2 - 4 q t†

†Note: Rate applied to citrus must not exceed 1/3 fl oz per gallon or 1 qt per 100 gallons. Rate applied to apples, pecans, or sweet cherries must not exceed 2/3 fl oz per gallon or 2 qt per 100 gallons.

Specific Directions:

1. **Lubber grasshoppers** must be controlled when they are small (less than 1 inch in length) by direct contact with spray.
2. For effective control of **spider mites** when large numbers of eggs are present, apply a second spray 3 to 5 days in the South or 7 to 10 days in the North after initial treatment to control newly hatched nymphs.

Warranty Disclaimer

DowElanco warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. DowElanco MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperature, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of DowElanco or the seller. All such risks shall be assumed by buyer.

Limitation of Remedies

The exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at DowElanco's election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used

DowElanco shall not be liable for losses or damages resulting from handling or use of this product unless DowElanco is promptly notified of such loss or damage in writing. In no case shall DowElanco be liable for consequential or incidental damages or losses.

The terms of the "Warranty Disclaimer" above and this "Limitation of Remedies" cannot be varied by any written or verbal statements or agreements. No employee or sales agent of DowElanco or the seller is authorized to vary or exceed the terms of the "Warranty Disclaimer" or this "Limitation of Remedies" in any manner.

*Trademark of DowElanco
DowElanco Ž Indianapolis, IN 46268 U.S.A.

LABEL CODE 113-15-009-0
Replaces label: 113-15-008-0

EPA APPROVAL 10/16/96

Revisions:

1. The restriction immediately below the product name must remain “To be applied only by or under the supervision of commercial applicators responsible for pest control programs.”
2. In the Precautions for General Use Indoors, the sentence “Adults, children and pets should not contact treated surfaces until spray has dried” was revised to read “Adults, children and pets must not contact treated surfaces until spray has dried.”
3. In the note to the directions for Spot Applications, the first sentence was revised to read ‘Thoroughly ventilating treated areas following application can reduce potential odors and speed drying.”
4. In the Specific Indoor Use Directions, the sentence “Humans or pets should not contact treated surfaces until the spray has dried” was revised to read “Humans or pets must not contact treated surfaces until the spray has dried.”
5. In the Specific Indoor Use Directions, #6, after the sentence “Product application must be restricted to surfaces inaccessible to direct contact with animals,” the sentence “Surfaces directly in contact with animals should not be sprayed within six feet of the floor was added.
6. In the Precautions for Perimeter Treatments, the sentence “Adults, children and pets should not contact treated surfaces until spray has dried” was revised to “Adults, children and pets must not contact treated surfaces until spray has dried.”
7. In the Precautions for Turf, Ornamental, and Fruit, Nut, and Citrus Tree Use, the sentence “Adults, children and pets should not contact treated surfaces until spray has dried” was revised to “Adults, children and pets must not contact treated surfaces until spray has dried.”
8. The advisory text “should not contact treated surfaces until the spray has dried was revised to “must not contact treated surfaces until the spray has dried wherever it occurs on the label.

SAGA® WP INSECTICIDE

Specimen Label

* *FOR RESIDUAL CONTROL OF MAJOR NUISANCE PESTS*
* *ONLY FOR SALE, USE AND STORAGE BY PEST CONTROL OPERATORS*
* *DESIGNED FOR USE IN FOOD/FEED AND NON-FOOD/NON-FEED AREAS OF FOOD/FEED PROCESSING PLANTS.*
* *FOR USE IN USDA INSPECTED FACILITIES*

ACTIVE INGREDIENT:

(1R, 3S) 3[(1'RS) (1', 2', 2',2' -tetrabromoethyl)] -2, 2-dimethyl-cyclopropanecarboxylic acid (S)- alpha-cyano-3-phenoxybenzyl ester[1]/ 40.00%

INERT INGREDIENTS: 60.00%

100.00%

[1]/ Tralomethrin.

PRECAUCION AL CONSUMIDOR: Si usted no lee ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

(TO THE USER: If you cannot read English, do not use this product until the label has been fully explained to you.)

EPA REG. NO. 432-755 **EPA EST. NO.:**

KEEP OUT OF REACH OF CHILDREN

WARNING

FIRST AID

If Swallowed:	♦ Call a poison control center or doctor immediately for treatment advice. ♦ Have person sip a glass of water if able to swallow. ♦ Do not induce vomiting unless told to by a poison control center or doctor. ♦ Do not give anything my mouth to an unconscious person.
If in Eyes:	♦ Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lens, if present, after the first 5 minutes, then continue rinsing. ♦ Call a poison control center or doctor for treatment advice.
If on Skin or Clothing:	♦ Take off contaminated clothing. ♦ Rinse skin immediately with plenty of water for 15-20 minutes. ♦ Call a poison control center or doctor for treatment advice.
If Inhaled:	♦ Move person to fresh air. ♦ If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to mouth, if possible.

Have container label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-800-334-7577 for emergency medical treatment information.

For Product Information Call Toll-Free: 1-800-331-2867

See Side Panel For Additional Precautionary Statements

NET CONTENTS:

BAYER ENVIRONMENTAL SCIENCE
A Business Group of Bayer CropScience LP
95 Chestnut Ridge Road • Montvale, NJ 07645

PRECAUTIONARY STATEMENTS
Hazards To Humans & Domestic Animals

WARNING

May be fatal if swallowed. Harmful if absorbed through the skin or inhaled. Causes eye irritation. Avoid breathing dust or spray mist. Avoid contact with skin, eyes or clothing. Contact with product may result in transient tingling and reddening of the skin. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco.

Environmental Hazards

This pesticide is extremely toxic to fish and other aquatic organisms, including crab and shrimp. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Use with care when applying in areas adjacent to any body of water. Do not contaminate water when disposing of equipment waters.

Physical & Chemical Hazards

Do not use water base sprays of SAGA WP in conduits, motor housings, junction boxes, or other electrical equipment because of possible shock hazard.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

STORAGE & DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

Storage: Mix as needed. Do not store diluted material. Store in original container in secured dry storage area. Prevent cross-contamination with other pesticides and fertilizers. If the container is leaking and/or material is spilled, on floor or paved surfaces, sweep up and remove to chemical waste area. Concentrate is stable at normal storage temperatures.

Pesticide Disposal: Wastes resulting from use of this product may be disposed of on site or at an approved waste disposal facility.

Container Disposal: Empty containers completely into application equipment. Do not reuse empty container. Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke.

GENERAL INFORMATION:

Saga WP is a wettable powder insecticide containing 40% by weight active ingredient which will provide effective and long residual control of the most pests listed on this label.

Remove pets and cover aquariums and terrariums before spraying.

Saga WP does not damage paints, plastics, fabrics or other surfaces where water alone causes no damage.

Saga WP is intended for use by professional applicators in and around residential and nonresidential structures and their immediate surroundings and on various modes of transportation. Permitted areas of use include, but are not limited to the Food/Feed and Non-Food/Non-Feed Areas of;

aircraft
apartment buildings
bakeries
bottling facilities
breweries
buses
cafeterias
candy plants
canneries
food manufacturing, processing and servicing establishments
grain mills
granaries
greenhouses (non-commercial)
hospitals
hotels
houses
industrial buildings and installations
laboratories
marine vessels
mausoleums
meat, poultry and egg processing and packing plants
nursing homes
railcars
restaurants
schools
ships and vessels
stores and institutions
trailers
trucks
warehouses
wineries

Treatments may be repeated as necessary to maintain adequate control.

MIXING INSTRUCTIONS:

Saga WP is intended to be mixed with water and applied with hand pressurized or power operated sprayers as a coarse spray. When diluting, add water to the spray tank and the appropriate amount of Saga WP. Thoroughly agitate the sprayer before using to insure proper suspension of the wettable powder. Re- invert sprayer before use if spraying is interrupted. If spray screens are used, they should be 50 mesh or larger. Dilute Saga WP insecticide only with water.

DOSAGE CHART:

This product is intended for dilution prior to applications as directed in the table below. Use the scoop provided for measuring from the jar. Each level scoopful contains 0.1 oz. Saga WP.

Pests	Concentration of Active Ingredient	Dilution Rate Per Gallon of Final Spray
ants, centipedes, clothes moths, cockroaches (maintenance rate), crickets, earwigs, flies, firebrats, gnats, midges, fleas (contact), millipedes, mosquitoes, silverfish, spiders	.03% w/w	1 Scoop*
bees, carpet beetles, cockroaches (clean out rate), fleas, hornets, killer bees, pillbugs, scorpions, sowbugs, ticks, yellow jackets, wasps	.06% w/w	2 Scoops
termites (Formosan & Eastern subterranean-localized control only)	.06% w/w	2 Scoops
fire ants, carpenter ants (localized control only)	.06% w/w	2 Scoops

*1 scoop = 0.1 ounce of Saga WP = 1 level teaspoon.

GENERAL PEST CONTROL INDOORS

Treat specific areas that insects inhabit or where they are frequently found. Mix 1 scoop (0.1 ounce) of Saga WP in one gallon of water and apply to adequately cover 1000 square feet. Do not allow dripping or run-off to occur. Under conditions of severe pest infestation, when quick knockdown and/or longer residual control is desired, mix 2 scoops (0.2 ounce) of Saga WP in one gallon of water and apply to adequately cover 1000 square feet. Do not allow dripping or run-off to occur. To insure consistent acceptable control of the target pest, proper sanitation and prevention of reinfestation are recommended.

Note: Do not permit adults, children or pets to contact treated surfaces

until spray has dried completely. Do not apply this product in patient rooms or in any rooms while occupied by the elderly or infirm. Do not apply to classrooms when occupied by students. Do not use as a space spray. Use in ventilated areas. Do not apply where electrical short circuits could occur. Use a dust or a dry bait in these areas.

PREMISE PEST CONTROL: ***Cockroaches, Ants, Crickets, Silverfish, Firebrats, Centipedes, Millipedes, Clothes Moths, Earwigs, Pillbugs, Sowbugs, Scorpions*** and ***Spiders:*** Apply as a coarse, low pressure spot or crack and crevice spray to areas that these pests normally inhabit. Pay particular attention to dark corners of rooms and closets; floor drains; cracks and crevices in walls; along and behind baseboards; beneath and behind sinks, stoves, refrigerators, and cabinets; around plumbing and other utility installations; doors, windows and in attics and crawl spaces. Applications may be made to floor surfaces along baseboards and around air ducts.

PANTRY PEST CONTROL: To kill adult and accessible stages of insect pests such as ***Lesser Grain Borers, Grain Weevils, Flour Beetles, Saw-toothed Grain Beetles, Cigarette Beetles, Merchant Grain Beetles, Angoumois Grain Moths, Mediterranean Flour Moths, Indian Meal Moths, Grain Mites*** and ***Spider Mites.***

Make application to cupboards, shelving and storage areas. Remove all food stuffs, all utensils, shelf paper and other objects before spraying. Allow all treated surfaces to dry and cover shelves with clean paper prior to replacing food stuffs, utensils or other items. Any food stuff accidentally contaminated with any spray solution should be discarded.

ANTS (including Pharoah Ants): Apply to trails, around doors and windows and other areas where ants inhabit or enter premises.

FLEAS: A total management program is recommended. It is suggested that infested areas be thoroughly vacuumed prior to treatment. These areas include all carpet, upholstered furniture, baseboards and other indoor areas frequented by pets. The vacuum cleaner bag should be discarded in an outdoor trash container. Pet bedding should be cleaned or replaced.

Apply Saga WP to rugs, carpets, upholstered furniture, pet beds, floor coverings, pet resting areas and other infested habitats. The quantity of finished spray required is dependent upon carpet/fabric density. Provide uniform coverage, apply until infested area is moist.

Effective ***Flea*** control includes controlling the source of flea infestations. This can require treatment of pets with an EPA approved product registered for such use and treating outside areas frequented by pets. Saga WP can also be applied out-of-doors for flea control. Do not treat pets with this product. Do not allow pets to contact treated areas until spray has dried. Remove animal and feed before spraying.

TICKS (INCLUDING LYME DISEASE VECTORS): Thoroughly apply Saga WP to infested areas, such as pet beds and resting quarters; nearby cracks and crevices; along baseboards, windows and door frames, where these pests may be present. For best results, old bedding should be replaced with clean bedding after treatment. Do not treat pets with this product. Do not allow pets to contact treated areas until spray has dried. Remove animals and feed before spraying. Saga WP can also be applied out-of-doors for tick control.

TERMITES, CARPENTER ANTS AND CARPENTER BEES: (For localized control only). Apply spray dilution to voids or channels in damaged wooden members of a structure, or to cracks, spaces or bearing joints between wooden members of a structure or between such members and the foundations, in locations vulnerable to attack such as crawl spaces. Drilling may be necessary prior to applying Saga WP to voids, cracks or joint spaces in vulnerable locations and to channeled sections of wood but it must be recognized that such drilling and treating of a timber in place may not result in complete coverage of infested and vulnerable voids or galleries. All treatment holes drilled in construction elements in commonly occupied areas of structures must be securely plugged. Inspect at 6 months and 1 year to insure that the colony has been killed.

The purpose of such applications of Saga WP is to kill workers or winged reproductive forms which may be present in the treated channels at the time of treatment. Such applications are not a substitute for mechanical alteration, soil treatment or foundation treatment but are merely a supplement. The purpose of such applications of Saga WP for termites is to kill workers or reproductive forms of the insect.

Do not apply solution until location of heat or air conditioning ducts, vents, water and sewer lines and electrical conduits are known and identified. When located, applications may be made around these structures. However, caution must be taken to avoid contamination of these structural elements and airways.

AIRCRAFT PEST CONTROL: Do not use in aircraft cabins. Apply to cracks, crevices, and other surfaces where the labeled pests have been seen or may have harborage. Allow spray to dry before re-entry.

FOOD/FEED HANDLING ESTABLISHMENTS

For control of all labeled pests, applications are permitted in food/feed and non-food/non-feed areas of food/feed handling and processing establishments as a general surface, spot or crack and crevice treatment.

Food/Feed handling establishments are defined as places other than private residences in which exposed food/feed is held, processed, prepared or served. Included also are areas for receiving, storing, packing (canning, bottling, wrapping, boxing), preparing, edible waste storage and enclosed processing systems (mills, dairies, edible oils, syrups) of food/feed. Serving areas where food/feed is exposed and the facility is in operation are also considered food/feed areas.

NOTE: Containers larger then one pound may not be marketed or stored in food handling establishments.

NON-FOOD/FEED AREAS

Examples of nonfood/nonfeed areas include garbage rooms,lavatories, floor drains (to sewers), entries and vestibules, offices, locker rooms, machine rooms, boiler rooms, mop closets and storage (after packaging, canning or bottling). All areas that insects inhabit or through which insects may enter should be treated.

USDA INSPECTED FACILITIES: Saga WP is authorized by USDA for use in federally inspected meat and poultry plants. This product is acceptable for use in edible product areas of official establishments operating under the Federal Meat, Poultry, Shell Egg Grading and Egg Products Inspection Programs, as a crack and crevice treatment. Saga WP is classified as an F2 residual insecticide according to regulations listed under Section 5.6(A)(1)(b) of the USDA Food Safety and Inspection Service Handbook. Refer to List of Proprietary Substances and Nonfood Compounds for authorized listing.

GENERAL SURFACE APPLICATION: Do not use this application method in the food/feed handling areas of the facility when the facility is in operation or foods are exposed. Do not apply directly to food/feed products. Cover or remove all food/feed processing and/or handling equipment during application. After application in food/feed processing plants, cafeterias and similar facilities, wash all equipment, benches, shelving and other surfaces which food/feed will contact. Clean food/feed handling or processing equipment and thoroughly rinse with clean, fresh water. After application in bakeries, clean all food/feed contact surfaces thoroughly with appropriate equipment.

SPOT, OR CRACK AND CREVICE APPLICATIONS: In USDA Inspected facilities, apply only when facility is not in operation. In non-USDA facilities, applications may be made while the facility is in operation provided

exposed food/feed is covered or removed from area being treated prior to application. Do not apply directly to food/feed or food/feed-handling surfaces.

In the home, do not allow spray to contact food/feed surfaces, if it does, clean surfaces with soap and water.

GENERAL PEST CONTROL OUTDOORS

Use Saga WP to control outdoor pests by application as either a perimeter treatment or as a residual spray.

PERIMETER TREATMENTS: To help prevent infestation of buildings, apply Saga WP where pests are active and may find entrance. For example, treat a band of soil 6 to 10 feet wide around and adjacent to buildings and treat the building foundation to a height of 2 to 3 feet. Apply as a coarse spray at the rate of 1 scoop or 2 scoops of Saga WP in sufficient water to adequately cover 1000 square feet (consult dosage chart). Thoroughly and uniformly wet the barrier area.

RESIDUAL SPRAY: To control ***Ants, Bees, Cockroaches, Crickets, Hornets, Spiders, Wasps*** and ***Yellow Jackets (contact kill),*** apply Saga WP as a coarse low pressure spray to surfaces of buildings, porches, screens, window frames, eaves, patios, lawns (residential only), refuse dumps and garages. For application to ***Bees, Hornets, Wasps*** and ***Yellow Jackets*** apply late in the evening when insects are at rest.

TO CONTROL ***Fire Ants*** apply as a mound drench at a rate of 2 scoops (0.2 ounce) per gallon of water. Sprinkle (watering can) one gallon diluted product over the surface of each mound up to 12 inches in diameter and two gallons for larger mounds. Thoroughly wet mound and surrounding area. If possible, applications should be made on a warm day after rainfall.

TO CONTROL ***Fleas*** **And** ***Ticks (including Lyme Disease Vectors, Ticks-contact Kill)*** apply Saga WP as a coarse wet spray to areas where fleas and ticks are most likely to be found, such as, but not limited to, dog houses, kennels, runways, cracks and crevices in sidewalks, paths or patios, under plants, shrubs, trees, or other shaded, moist areas where pests may rest.

FLIES, MIDGES, GNATS, AND MOSQUITOES: (for use as an aid in reducing annoyance from these insects) Spray outside surfaces of doors, screens, window frames, or wherever these insects may enter the room. Also, spray surfaces around light fixtures, on porches, in garages and other places where these insects alight or congregate.

CARPENTER ANTS: To control inside trees, utility poles, fencing and decking materials and similar structural members, drill to find the interior infested cavity and inject 0.06% dilution using appropriate treatment tool with splashback guard. To control tunneling Carpenter Ants in soil, apply 0.06% dilution as a drench or inject at intervals of 8 to 12 inches, using 1 quart per linear foot. Establish a uniform barrier at the edge of walls, driveways, or other hard surfaces where ants are tunneling beneath the surfaces. To protect firewood from carpenter ants and termites, treat soil beneath firewood prior to stacking with a 0.06% dilution at 1 gallon per 8 square feet to prevent infestation.

ORNAMENTAL PESTS: To control ***Armyworms, Bagworms, Cankerworms, Cutworms, Elm Leaf Beetles, Flea Beetles, Grasshoppers, Gypsy Moth Larvae, Adult Japanese*** **And** ***June Beetles, Lacebugs, Leafhoppers, Leafrollers, Leaf Skeletonizers, Loopers, Oakworms, Plant Bugs, Pine Moths, Sawfly Larvae, Spanworms, Stinkbugs, Tent Caterpillars, Ticks, Treehoppers, Webworms.***

Use Saga WP at 1 scoop per 20 gallons of water (plus spreader/sticker) and spray foliage thoroughly but not the point of run-off.

Not For Use In Commercial Greenhouses Or Nurseries.

Not for use on plants being grown for sale or other commercial use, or for commercial seed production, or for research purposes. For use on plants intended for aesthetic purposes or climate modification and being grown in ornamental parks and gardens or lawns and grounds.

LAWN AND GROUNDS PESTS: To control ***Ants Armyworms, Chinchbugs, Crickets, Cutworms, Sod Webworms, Fleas*** and ***Ticks.***

Use Saga WP at 1 scoop per 5 gallons of water and spray at 4 gallons per 1000 square feet.

Not for use on sod farms, grass grown for seed or on golf course turf.

TANK MIXING (INDOORS AND OUTDOORS)

GENERAL: Saga WP can be tank mixed with pesticides currently registered for similar use patterns, unless the companion product label specifically prohibits such mixing. Tank-mix applications must be made in accordance with the more restrictive of label limitations and precautions. No label application rates may be exceeded. Prior to tank-mixing, a small jar compatibility test should be conducted using the proper proportions of chemicals and water to ensure the physical compatibility of the mixture. When tank-mixing with Saga WP, first add the Saga to the diluent and agitate to thoroughly suspend it in solution, then add the prescribed amount of companion product.

In combination with KICKER:

For enhanced flushing and knockdown of ***Cockroaches,*** tank mix at the rate of 1/4 to 1/2 ounce (equivalent to 1/2 to 1 tablespoon or 7.4 to 14.8 ml) of Kicker per gallon of finished spray and apply as directed above.

For improved control of pyrethroid resistant ***German Cockroaches,*** tank mix at the rate of 2 to 4 ounces of Kicker per gallon and apply as directed above.

For knockdown of ***Adult Fleas,*** tank mix at the rate of 0.5 to 1 ounce of Kicker per gallon and apply as directed above.

IN COMBINATION WITH INSECT GROWTH REGULATORS (IGR'S): To extend control of immature stages of Cockroaches and Fleas, tank mix the recommended rate of Saga WP with the correct amount of IGR per finished gallon. Follow all directions for use patterns and spray intervals from the IGR label to achieve maximum benefit.

Thoroughly wash out sprayer and screen with detergent and warm water before and after use. Do not mix this product with oil. Do not apply this product to edible crops.

IMPORTANT: READ BEFORE USE

Read the entire Directions for Use, Conditions, Disclaimer of Warranties and Limitations of Liability before using this product. If terms are not acceptable, return the unopened product container at once.

By using this product, user or buyer accepts the following conditions, disclaimer of warranties and limitations of liability.

CONDITIONS: The directions for use of this product are believed to be adequate and should be followed carefully. However, because of manner of use and other factors beyond Bayer Environmental Science's control, it is impossible for Bayer Environmental Science to eliminate all risks associated with the use of this product. As a result, crop injury or Ineffectiveness is always possible. All such risks shall be assumed by the user or buyer.

DISCLAIMER OF WARRANTIES: BAYER ENVIRONMENTAL SCIENCE MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, THAT EXTEND BEYOND THE STATEMENTS MADE ON THIS LABEL. No agent of Bayer Environmental Science is authorized to make any warranties beyond those contained herein or to modify the warranties contained herein. Bayer Environmental Science disclaims any liability whatsoever for special, incidental or consequential damages resulting

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LIMITATIONS OF LIABILITY: THE EXCLUSIVE REMEDY OF THE USER OR BUYER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, WHETHER IN CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE, SHALL NOT EXCEED THE PURCHASE PRICE PAID, OR AT BAYER ENVIRONMENTAL SCIENCE'S ELECTION, THE REPLACEMENT OF PRODUCT.

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BAYER ENVIRONMENTAL SCIENCE
A Business Group of Bayer CropScience LP
95 Chestnut Ridge Road
Montvale, NJ 07645

PRODUCT OF FRANCE

SWP-SL-04/03

Specimen Label

Dow AgroSciences

Dursban* TC

Specialty Termiticide Concentrate

*Trademark of Dow AgroSciences LLC

For use by individuals/firms licensed or registered by the state to apply termiticide products. States may have more restrictive requirements regarding qualifications of persons using this product. Consult the structural pest control regulatory agency of your state prior to use of this product.

Active ingredient:
chlorpyrifos: O,O-diethyl O-(3,5,6-trichloro-2 pyridinyl) phosphorothioate 44.0%
Inert Ingredients 56.0%
Total Ingredients 100.0%

Contains 4 pounds of chlorpyrifos per gallon.

EPA Reg. No. 62719-47

Keep Out of Reach of Children

WARNING AVISO

Precaution al usuario: Si usted no lee ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

Precautionary Statements

Hazards to Humans and Domestic Animals

Precaution al usuario: Si usted no lee ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

May Be Fatal If Swallowed Excessive Absorption Through Skin May Be Fatal • Causes Substantial But Temporary Eye Injury • May Cause Skin Irritation.

Do not get in eyes, on skin or clothing. Avoid breathing vapors and spray mist. Handle concentrate in a ventilated area. Wash thoroughly with soap and water after handling and before eating or smoking. Remove contaminated clothing and wash before reuse. Keep away from food, feedstuffs and water supplies.

Personal Protective Equipment (PPE)

Mixers and loaders must wear a minimum of long-sleeved shirt and long pants, chemical-resistant footwear, chemical-resistant gloves, and protective eyewear (goggles, a faceshield, or safety glasses with front, brow, and temple protection. **Mixers and loaders** who do not use a mechanical system (such as the Voyager* container or in-line injector) to transfer the contents of this container must wear coveralls or chemical-resistant apron in addition to other required PPE.

Pesticide applicators must wear long-sleeved shirt and long pants, socks, shoes, and chemical-resistant gloves.

In addition, all pesticide handlers must wear a respiratory protection device (MSHA/NIOSH approved number TC-21C) and protective eyewear when working in a non-ventilated space and all pesticide applicators must wear protective eyewear when applying termiticide by rodding or sub-slab injection.

First Aid

If swallowed: Call a physician or Poison Control Center immediately. Do not induce vomiting. Contains an aromatic petroleum solvent. Do not give anything by mouth to an unconscious person.
If on skin: Immediately wash with plenty of soap and water. Get medical attention.
If in eyes: Flush with plenty of water for 15 minutes. Get medical attention.
If inhaled: Remove to fresh air if symptoms of cholinesterase inhibition appear and get medical attention immediately.
Note to physician: Chlorpyrifos is a cholinesterase inhibitor. Treat symptomatically. If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). Atropine, only by injection, is the preferable antidote. Oximes, such as 2-PAM/protopam, may be therapeutic if used early; however, use only in conjunction with atropine. In case of severe acute poisoning, use antidote immediately after establishing an open airway and respiration.

Environmental Hazards

This pesticide is toxic to birds and wildlife, and extremely toxic to fish and aquatic organisms. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent aquatic sites. Cover or incorporate spills. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters.

Physical or Chemical Hazards

Do not use or store near heat or open flame.

Notice: Read the entire label. Use only according to label directions.
Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" elsewhere on this label.

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at www.dowagro.com.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
Read all Directions for Use carefully before applying.

Do not tank mix this product with products containing dichlorvros (DDVP).
Do not formulate this product into other end-use products.

Storage and Disposal

Do not contaminate water, food or feed by storage or disposal.
Storage: Store in original container in secured dry storage area. Prevent cross-contamination with other pesticides and fertilizers. Avoid storing above 122°F for extended periods of time. Storage below 40°F may result in formation of crystals. If product crystallizes, store at 55-75°F and shake occasionally to redissolve crystals. If container is damaged or spill occurs, use product immediately or dispose of product and damaged container as indicated below.
Pesticide Disposal: Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of according to label instructions, contact your state pesticide or environmental control agency, or the hazardous waste representative at the nearest EPA regional office for guidance.
Container Disposal for Non-Refillable Containers: Triple rinse (or equivalent) then offer for recycling or reconditioning, or puncture and/or crush rinsed, empty container and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.
or
Triple rinse (or equivalent). Then dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.
Container Disposal for Refillable Containers: Replace the dry disconnect cap, if applicable, and seal all openings which have been opened during use. Return the empty container to a collection site designated by Dow AgroSciences. If the container has been damaged and cannot be returned according to the recommended procedures, contact Dow AgroSciences Customer Service Center at l-800-2581470 to obtain proper handling instructions.

General Information

Subterranean Termites

Dursban* TC termiticide concentrate for soil treatment is used to establish a barrier which is lethal to termites. In order to provide an effective barrier between the wood in the structure and termite colonies in the soil, disperse the chemical emulsion so as to avoid untreated gaps in the barrier.

It is important that the service technician be familiar with current control practices including trenching, rodding, subslab injection and low pressure spray applications. These techniques must be correctly employed to prevent or control infestations by subterranean termite species of *Reticuliterrnes, Zootermopsis, Heterotermes* and *Coptotermes.* Choice of appropriate procedures includes consideration of such variable factors as the design of the structure, water table, soil type, soil compaction, grade conditions and the location and type of domestic water supplies. The biology and behavior of the involved termite species are important factors to be known as well as suspected location of the colony and severity of the infestation within the structure to be protected. For advice concerning current control practices for specific local conditions, consult resources in structural pest control.

General Use Precautions

All nonessential wood and cellulose containing materials, including scrap wood and form boards, should be removed from around foundation walls, crawl spaces, and porches. This does not include existing structural soil contact wood that has been treated.

When treating adjacent to an existing structure, the applicator must check the areas to be treated, and immediately adjacent areas of the structure for visible and accessible cracks and holes to prevent any leaks or significant exposures to persons occupying the structure. People present or residing in the structure during application must be advised to remove their pets and themselves from the structure if they see any signs of leakage. After application, the applicator is required to check for leaks.

All leaks resulting in the deposition of termiticide in locations other than those prescribed on this label must be cleaned up prior to leaving the application site. Do not allow people or pets to contact contaminated areas or to reoccupy the contaminated areas of the structure until the cleanup is completed.

Retreatment for subterranean termites can only be performed if there is clear evidence of reinfestation or disruption of the barrier due to construction, excavation, or landscaping and/or evidence of the breakdown of the termiticide barrier in the soil. These vulnerable or reinfested areas may be retreated in accordance with application techniques described in this product's labeling. The timing and type of these retreatments will vary, depending on factors such as termite pressure, soil types, soil conditions and other factors which may reduce the effectiveness of the barrier.

Annual retreatment of the structure is prohibited unless there is clear evidence that reinfestation or barrier disruption has occurred.

Contamination of public and private water supplies must be avoided by following these minimum precautions:

1. Use anti-back flow equipment or procedures to prevent siphonage of pesticide back into water supplies.
2. Do not treat soil that is water saturated or frozen
3. Do not treat while precipitation is occurring.
4. Consult Federal, state and local specifications for information regarding approved treatment practices in your area.
5. Do not contaminate wells or cisterns. See specific "Treatment of Structures with Wells, Cisterns or Other Bodies of Water Adjacent to Treated Sites".

Rate Determination Guidelines
Consult the local extension agent or state entomologist for application rate recommendations.

An initial treatment using a 0.75-1.0% dilution will provide effective, optimum long term residual control.

A 2.0% dilution may be used to protect utility poles and fence posts.

Table 1 - Dilution Directions

Gallons of Finished Dilution Desired	Dursban TC Needed			
	0.5%	0.75%	1.0%	2.0%
1	1 1/3 fl oz	2 fl oz	2 2/3 fl oz	5 1/3 fl oz
5	6 2/3 fl oz	10 fl oz	13 1/3 fl oz	26 2/3 fl oz
10	13 1/3 fl oz	20 fl oz	26 2/3 fl oz	53 1/3 fl oz
24	1 qt	1 1/2 qt	1/2 gal	1 gal
48	1/2 gal	3 qt	1 gal	2 gal
97	1 gal	1 1/2 gal	2 gal	4 gal

Mixing Directions
It is important that the termiticide dilution be uniformly mixed in the spray tank before beginning the treatment. Once mixed, Dursban TC will not settle out in the tank although the initial mixing will be enhanced by agitation, circulation through the treating hose, and the filling process.

1. Fill tank 1/4 to 1/3 full.
2. Start pump to begin by-pass agitation and place end of treating tool in tank to allow circulation through hose.

3. Add appropriate amount of Dursban TC.
4. Add remaining amount of water.
5. Let pump run and allow recirculation through the hose for 2 to 3 minutes.

Application Volume
To provide maximum control and protection against termite infestation, apply the specified volume of the finished water emulsion and active ingredient as set forth in the Directions for Use section of this label. If soil will not accept the labeled application volume, such as heavy, clay-type soils, the volume may be reduced provided there is a corresponding increase in concentration so that the amount of active ingredient applied to the soil remains the same. This would also apply to sensitive areas and/or horizontal applications where less volume may be desirable. Minimum volumes will be specified in the appropriate use directions. In light textured soils such as sand or gravel which accept larger amounts of water, increased volumes which deliver the appropriate concentration of termiticide in the soil may be used. Maximum volumes will be specified in the appropriate use directions. Note: Large reductions of application volume reduce the ability to obtain a continuous barrier. Variance is allowed when volume and concentration are consistent with label directed rates and a continuous barrier can still be achieved.

Treatment of Structures with Wells, Cisterns or Other Bodies of Water Within or Adjacent to Treated Sites

Do not contaminate wells or cisterns.

1. **Structures With Wells/Cisterns Inside Foundations:** Structures that contain wells or cisterns within the foundation of a structure can only be treated using the following techniques:

   a. Do not treat soil while it is beneath or within the foundation or along the exterior perimeter of a structure that contains a well or cistern. The treated backfill method may be used if soil is removed and treated outside/away from the foundation. The treated backfill technique is described as follows:

      (1) Trench and remove soil to be treated onto heavy plastic sheeting or similar material or into a wheelbarrow.

      (2) Treat the soil at the rate of 4 gallons of dilute emulsion per 10 linear feet per foot of depth of the trench, or 1 gallon per 1.0 cubic feet of soil. See "mixing Directions" section of this label. Mix thoroughly into the soil taking care to contain the liquid and prevent runoff or spillage.

      (3) After the treated soil has absorbed the diluted emulsion, replace the soil into the trench.

   b. Infested and/or damaged wood in place may be treated using an injection technique such as described in the "Control of Wood Infesting Insects" section of this label.

2. **Structure With Adjacent Wells/Cisterns and/or Other Water Bodies:** Applicators must inspect all structures with nearby water sources such as walls, cisterns, surface ponds, streams, and other bodies of water and evaluate, at a minimum, the treatment recommendations listed below prior to making an application.

   a. Prior to treatment, if feasible, expose the water pipe(s) coming from the well to the structure, if they enter the structure within 3 feet of grade.

   b. Prior to treatment, applicators are advised to take precautions to limit the risk of applying the termiticide into subsurface drains that could empty into any bodies of water. These precautions include evaluating whether application of the termiticide to the top of the footer may result in contamination of the subsurface drain. Factors such as depth to the drain system and soil type and degree of compaction should be taken into account in determining the depth of treatment.

   c. When appropriate (i.e., on the water side of the structure), the treated backfill technique (described above) can also be used to minimize off-site movement of termiticide.

Preconstruction Subterranean Termite Treatment

Preconstruction applications are defined as those applications made prior to the finished grade being installed. Effective Preconstruction treatment for subterranean termite prevention requires the establishment of vertical and/or horizontal chemical barriers between wood in the structure and the termite colonies in the soil. Follow state and local regulations to meet minimum treatment standards for preventive Preconstruction treatments.

Do not apply at a lower dosage and/or concentration than specified this label for applications prior to installation of the finished grade.

Prior to each application, applicators must notify the general contractor, construction superintendent, or similar responsible party, of the intended termiticide application and intended sites of application and instruct the responsible person to notify construction workers and other individuals to leave the area to be treated during application and until the termiticide is absorbed into the soil.

See "Rate Determination Guidelines" and "Table 1" for dilution directions.

1. For **horizontal barriers:** applications shall be made using a low pressure spray after grading is completed and prior to the pouring of the slab or footing.

   a. For a 0.75% rate, apply 1 gallon of dilution per 10 square feet or use 2 fluid ounces of Dursban TC per 10 square feet in sufficient water (not less than 1/2 or more than 2 gallons) to provide thorough and continuous coverage of the area being treated (see Application Volume section).

      For a 1.0% rate, apply 1 gallon of dilution per 10 square feet, or use 2 2/3 fluid ounces of Dursban TC per 10 square feet in sufficient water (no less than 1/2 gallon or more than 2 gallons) to provide thorough and continuous coverage of the area being treated (See "Application Volume").

      If the fill is washed gravel or other coarse material, it is important that a sufficient amount of dilution be used to reach the soil substrate beneath the coarse fill.

b. If concrete slabs cannot be poured over the soil the same day it has been treated, a vapor barrier should be placed over the treated soil to prevent disturbance of the termiticide barrier.

2. For **vertical barriers,** apply the 0.75-1.0% dilution at a rate of 4 gallons per 10 linear feet per foot of depth. Establish vertical barriers in areas such as around foundations, plumbing lines, backfilled soil against foundation walls and other areas which may warrant more than just a horizontal barrier.

   a. When treating foundations deeper than 4 feet, apply the termiticide as the backfill is being replaced, or if the construction contractor tails to notify the applicator to permit this, treat the foundation to a minimum depth of 4 feet after the backfill has been installed. The applicator must trench and rod into the trench or trench along the foundation walls and around pillars and other foundation elements, at the rate prescribed from grade to a minimum depth of 4 feet. When the top of the footing is exposed, the applicator must treat the soil adjacent to the footing to a depth not to exceed the bottom of the footing. However, in no case should a structure be treated below the footing.

   b. Trenches need not be wider than 6 inches. Treat soil with the dilution as it is being replaced in the trench.

      For a 0.75% rate, apply 4 gallons of dilution per 10 linear feet per foot of depth or 8 fluid ounces of Dursban TC per 10 linear feet per foot of depth from grade to top of footing in sufficient water (not less than 2 gallons or more than 8 gallons) to ensure complete coverage.

      For a 1.0% rate, apply 4 gallons of dilution per 10 linear feet per foot of depth or 10 2/3 fluid ounces of Dursban TC per 10 linear feet per foot of depth from grade to top of footing in sufficient water (not less than 2 gallons or more than 8 gallons) to ensure complete coverage.

   c. Hollow block foundations or voids of masonry can be treated to make a complete chemical barrier especially if the soil was not treated prior to pouring the footing. Apply the dilution at a rate of 2 gallons per 10 linear feet so that it reaches the top of the footing.

   d. For crawl spaces, establish a vertical barrier on both sides of the foundation and around all piers and areas where underground utilities exit the soil. Do not apply the dilution to the entire surface area intended as the crawl.

3. For **plenum type structures** which use a sealed under-floor space to circulate heated and/or cooled air throughout the structure. Apply the dilution at the rate of 4 gallons per 10 linear feet per foot of depth. Soil adjacent to both sides of foundation walls, supporting piers, plumbing and conduits should be treated by trenching or rodding (where soil conditions permit) to a depth of 6 inches or, if less shallow, to the top of the footing. When conditions will not permit trenching or rodding, surface application adjacent to interior foundation walls may be made but the treated strip shall not exceed a width of 18 inches, horizontally, from the foundation walls, piers or pipes. The surface application should be made at a rate of 1 gallon per 10 square feet as a very coarse spray under low pressure (not to exceed 20 psi. when measured at the treating tool). After soil treatment, a continuous vapor barrier of at least 6 mil polyethylene film or other suitable vapor barrier must be installed on the ground surface over the entire subfloor area and on the inside of the plenum walls, in accordance with the recommended practices for plenum type structures.

Postconstruction Treatments

Postconstruction applications are defined as those applications mad after the final grade is installed.

See "Rate Determination Guidelines" and "Table 1" for dilution directions.

Precaution: Do not apply dilution until location of heat or air conditioning ducts, vents, water and sewer lines and electrical conduits are known and identified. Extreme caution must be taken to avoid contamination of these structural elements and airways.

All holes in commonly occupied areas into which material has been applied must be plugged. Plugs should be of a non-cellulose material or covered by an impervious, non-cellulose material.

1. For **slab-on-ground construction** applications may be made using techniques such as sub-slab injection, rodding and/or trenching. Injectors should not extend beyond the tops of the footings.

   a. Treat along the outside of the foundation to form a continuous termiticide barrier in the soil.

      For shallow foundations, 1 foot or less, dig a narrow trench approximately 6 inches wide along the outside of the foundation walls. Do not dig below the bottom of the footings. For foundations with exposed footings, dig a trench alongside the footing taking care not to undermine the footing. The dilution should be applied to the trench and mixed with the soil as it is replaced in the trench.

      For a 0.75% rate, apply 4 gallons of dilution per 10 linear feet or use 8 fluid ounces of Dursban TC per 10 linear feet in sufficient water (not less than 2 gallons or more than 8 gallons) to provide thorough and complete coverage of the area being treated (see Application Volume section).

      For a 1.0% rate, apply 4 gallons of dilution per 10 linear feet or use 10 2/3 fluid ounces of Dursban TC per 10 linear feet in sufficient water (no less than 2 gallons or more than 8 gallons) to provide thorough and complete coverage of the area being treated (See "Application Volume").

      For foundations with footings deeper than 1 foot, apply the dilution at a rate of 4 gallons per 10 linear feet per foot of depth. For applications made after the final grade is installed, the applicator must trench and rod into the trench or trench along the foundation walls and around pillars and other foundation elements at the rate prescribed from grade to the top of the footing. When the footing is more than 4 feet below grade, the applicator must trench and rod into the trench or trench along the foundation wall at the rate prescribed to a minimum depth of 4 feet. The actual depth of treatment will vary depending on soil type, degree of compaction, and location of termite activity. When the top of the footing is exposed, the applicator must treat the soil adjacent to the footing to a depth not to exceed the bottom of the footing. However, in no case should a structure be treated below the footing.

b. When treating cracks and expansion joints in the slab, along sidewalks or patios adjacent to the exterior foundation wall or other areas where holes are to be drilled to form a continuous termiticide barrier, the holes should be spaced at intervals up to 24 inches depending on soil type.

Hard, dry soils typically allow good lateral (horizontal) dispersion. However, they may be slow in absorption or downward movement Care must be taken when injecting through slabs into areas with this type of soil. Low pressures should be considered in this situation. This will help to avoid backsplashing from the injection hole, backflow from cracks and expansion joints, and unwanted emergence of the termiticide dilution from adjacent drill holes. A slow, low pressure application using the proper volume of termiticide dilution will allow the soil to absorb the liquid and provide an adequate vertical barrier. The wider drill hole spacings (18 to 24 inches) can usually be used in this situation. Sand, loam, or gravel backfill materials are commonly found under slab foundations. The type of fill, amount of settling that has occurred, moisture content, etc., will determine drill hole spacing and amount of termiticide dilution to be injected through each hole. Highly absorptive soils or those with large pore spaces (gravel, coarse sand) will afford rapid downward (vertical) movement and limited lateral (horizontal) distribution of the termiticide dilution. In this situation, consider using a lateral dispersion tip on the sub-slab injector and place the drill holes closer together (12 to 18 inches).

For a 0.75-1.0% rate, apply 4 gallons of dilution per 10 linear feet.

c. It may be necessary to treat along one side of interior partition wails if there are cracks in the slab, plumbing entry points, existing termite infestations, or other conditions which would make treatment appropriate.

d. To complete the termiticide barrier under slab foundations, it may be necessary to drill and treat near plumbing and electrical entry areas, cracks, or other areas where termites might enter the structure. In this instance, one or more holes should be drilled in the slab as close to the entry point as is practical and termiticide placed in the fill. As a general rule, 3 to 5 gallons of dilution per entry point will usually give adequate coverage, however, the use of directional or lateral dispersion tips or foam delivery systems can give adequate coverage with lower volumes. Location of the drill hole in relation to the entry point, type of soil fill, presence or absence of a vapor barrier, application pressure and other considerations will affect the coverage and volume of termiticide needed to form a complete barrier. Precautions must be taken to avoid drilling into plumbing or electrical conduit

e. When necessary, drill through the foundation walls from the outside and force the dilution just beneath the slab either along the inside of the foundation or along all the cracks and expansion joints and other critical areas.

f. **Bath traps:** Exposed soil or soil covered with tar or a similar type sealant beneath and around plumbing and/or drain pipe entry areas may be treated with a 0.75-1.0% dilution of Dursban TC.

An access door or inspection vent should be cut and installed, if not already present. Alter inspection and removal of any wood or cellulose debris, the soil can be treated by rodding or drenching the soil. A one square foot bath trap will usually require about 3 to 5 gallons of dilution for thorough and complete coverage.

2. **Hollow block foundations or voids in masonry** sting on the footing can be treated to make a continuous chemical barrier in the voids. If the void has direct contact with the soil, it should be treated. Drill and treat all voids in multiple masonry elements of the structure extending from the structure to the soil in order to create a continuous treatment barrier in the area to be treated. Apply at the rate of 2 gallons of emulsion per 10 linear feet of footing using a nozzle pressure of less than 25 psi. When using this treatment access holes must be drilled below the sill plate and should be as close as possible to the footing as is practical. Treatment of voids in block or rubble foundation walls must be closely examined. Applicators must inspect areas of possible runoff as a precaution against application leakage in the treated areas. Some areas may not be treatable of may require mechanical alteration prior to treatment.

Not for use in voids insulated with rigid foam.

3. For **basements,** apply at a rate of 4 gallons of dilution per 10 linear feet per foot of depth. Where footings are greater than 1 foot of depth from the grade to the top of the footing, application may be made by trenching and/or rodding at a rate of 4 gallons of dilution per 10 linear feet per foot of depth. When the footing is more than 4 feet below grade, the applicator must trench and rod into the trench or trench along the foundation wall at the rate prescribed to a minimum depth of 4 feet. The actual depth of treatment will vary depending on soil type, degree of compaction, and location of termite activity. When the top of the footing is exposed, the applicator must treat the soil adjacent to the footing to a depth not to exceed the bottom of the footing. However, in no case should a structure be treated below the footing. Treat outside of foundation walls, and if necessary beneath the basement floor along inside of foundation walls, along cracks in basement floors, along interior load bearing walls, around sewer pipes, conduits and piers.

4. **Accessible Crawl Spaces:** For crawl spaces, apply vertical termiticide barriers at the rate of 4 gallons of emulsion per 10 linear feet per foot of depth from grade to top of footing, or if the footing is more than 4 feet below grade, to a minimum depth of 4 feet.

For a 0.75% rate, apply 4 gallons of dilution per 10 linear feet per foot of depth or 8 fluid ounces of Dursban TC per 10 linear feet per foot of depth from grade to top of footing in sufficient water (not less than 2 gallons or more than 8 gallons) to ensure complete coverage.

For a 1.0% rate, apply 4 gallons of dilution per 10 linear feet per foot of depth or 10 2/3 fluid ounces of Dursban TC per 10 linear feet per foot of depth from grade to top of footing in sufficient water (not less than 2 gallons or more than 8 gallons) to ensure complete coverage.
Apply by trenching and rodding into the trench, or trenching. Treat both sides of foundation and around all piers and pipes.

Where physical obstructions, such as concrete walkways adjacent to foundation elements, prevent trenching, treatment may be made by rodding alone. When soil type and/or conditions make trenching prohibitive, rodding may be used. When the top of the footing is exposed, the applicator must treat the soil adjacent to the footing to a depth not to exceed the bottom of the footing. Read and follow the mixing and use direction section of the label if situations are encountered where the soil will not accept the full application volume.

a. Rod holes and trenches shall not extend below the bottom of the footing.

b. Rod holes shall be spaced so as to achieve a continuous chemical barrier but in no case more than 12 inches apart.

c. Trenches shall be a minimum of 6 inches deep or to the bottom of the footing, whichever is less, and need not be wider than 6 inches. When trenching in sloping (tiered) soil, the trench shall be stepped to ensure adequate distribution and to prevent termiticide from running off. The emulsion must be mixed with the soil as it is replaced in the trench.

d. When treating crawl spaces, turn off the air circulation system of the structure until application has been completed and all termiticide has been absorbed by the soil.

5. **Inaccessible Crawl Spaces:** For inaccessible interior areas, such as areas where there is insufficient clearance between floor joists and ground surfaces to allow operator access, excavate if possible, and treat according to the instructions for accessible crawl spaces. Otherwise, apply one or a combination of the following two methods. For a 0.75% rate, apply 4 gallons of dilution per 10 linear feet or 8 fluid ounces of Dursban TC per 10 linear feet in sufficient water (not less than 2 gallons or more than 8 gallons) to ensure complete coverage (See Application Volume section).

For a 1.0% rate, apply 4 gallons of dilution per 10 linear feet or 10 2/3 fluid ounces of Dursban TC per 10 linear feet in sufficient water (not less than 2 gallons or more than 8 gallons) to ensure complete coverage (See "Application Volume").

a. To establish a horizontal barrier, apply 1 gallon of emulsion per 10 sq. ft. to the soil surface. Use a nozzle pressure of less than 25 psi. and a coarse application nozzle (e.g., Delavan Type RD Raindrop, RD-7 or larger, or Spraying Systems Co. 8010LP TeeJet or comparable nozzle). For an area that cannot be reached with the application wand, use one or more extension rods to make the application to the soil. Do not broadcast or powerspray with higher pressures.

b. To establish a horizontal barrier, drill through the foundation wall or through the floor above and treat the soil perimeter at a rate of 1 gallon of emulsion per 10 square feet Drill spacing must be at intervals not to exceed 16 inches. Many states have smaller intervals so check state regulations which may apply.

When treating crawl spaces, turn off the air circulation system of the structure until application has been completed and all termiticide has been absorbed by the soil.

c. In the presence of unsupported termite tubes, mechanically destroy each tube and apply approximately 1 pint of 0.75 1.0% dilution to an area of no more than 18 inches in diameter where the tubes emerged from the soil.

6. In **plenum type structures,** which use a sealed under-floor space to circulate heated and/or cooled air within the structure, turn off the air circulation system of the structure until application has been completed and all termiticide has been absorbed by the soil. Apply the 0.75-1.0% dilution at the rate of 4 gallons per 10 linear feet per foot of depth. Soil adjacent to both sides of foundation walls, supporting piers, plumbing and conduits should be treated by trenching or rodding (where soil conditions permit) to a depth of 6 inches or to the top of the footing. When conditions will not permit trenching or rodding, a surface application adjacent to interior foundation walls may be made, but the treated strip shall not exceed a width of 18 inches, horizontally, from the foundation piers or pipes. The surface application should be made at a rate of 1 gallon per 10 square feet as a very coarse spray under low pressure (not to exceed 20 psi. when measured at the treating tool). In order to properly calculate the amount of termiticide dilution needed, use the following guideline: A strip 18 inches wide and 6 feet 8 inches long is equal to 10 square feet Before treatment, a barrier of at least 6 mil polyethylene film or other suitable vapor barrier must be present on this ground surface over the entire subfloor area in accordance with recommended practices for plenum type structures. Install a new vapor barrier if barrier is absent or deteriorated. The vapor barrier film on the ground and foundation walls must be folded back from the areas to be treated prior to treatment and replaced immediately following treatment. Structures should be ventilated during application and until treatment is dry.

7. **Application using foam generating equipment:** The emulsion may be converted to a foam and the foam used to control or prevent termite infestations.

Depending on circumstances, foam applications may be used alone or in combination with liquid emulsion applications. Applications may be made behind veneers, piers, chimney bases, into rubble foundations, into block voids or structural voids, under slabs, stoops, porches, or to the soil in crawl spaces, and other similar voids.

Foam and liquid application must be consistent with volume and active ingredient instructions in order to ensure proper application has been made. The volume and amount of active ingredient are essential to an effective treatment. At least 50 to 75% of the labeled liquid emulsion volume of product must be applied, with the remaining percent delivered to appropriate areas using foam application. Refer to the label and use recommendations of the foam manufacturer and the foaming equipment manufacturer for adjuvant rates to produce the needed expansion ratio with this product.

Foam applications are generally a good supplement to liquid treatments in difficult areas, but may be used alone in difficult spots.

The following provides the amount of Dursban TC required for a given area and volume range of the prefoamed termiticide dilution necessary for application of the product.

For a 0.75% rate, apply 8 fluid ounces of Dursban TC per 10 linear feet using no less than 2 gallons, or more than 8 gallons, of prefoamed dilution.

For a 1% rate, apply 10 2/3 fluid ounces of Dursban TC per 10 linear feet using no less than 2 gallons, or more than 8 gallons, of prefoamed dilution.

8. Application in conjunction with the use of the Sentricon* Colony Elimination System: As a part of the integrated pest management (IPM) program for subterranean termite control, Dursban TC may be applied to critical areas of the structure including plumbing and utility entry sites, bath traps, expansion joints, foundation cracks, and areas with known or suspected infestations at a rate of 0.75%-1.0% as a spot application or complete barrier treatment. Application may be made as described in the Postconstruction Treatment section of this label.

Underground Utility Cable and Conduit

Preventative Treatment for Use Only in Guam, Hawaii, and Other Pacific Islands: Use a 1.0% to 2.0% dilution (See "Rate Determination Guidelines" and "Table 1" for dilution directions). After digging the trench, place approximately 6 inches of backfill or sand at the bottom and apply 2 gallons of the dilution per 10 linear feet. Allow to dry then replace the cable backfill. Cover with an additional 6 inches of backfill or sand and apply another 2 gallons of emulsion per 10 linear feet. Finish filling trench with untreated soil.

Wherever cables emerge from the soil to enter poles, light frames, etc., treat the soil around the cable and pole or frame to establish a continuous 6 inch chemical barrier.

A continuous 6 inch chemical barrier must be established around the cable to insure protection from termite attack.

Utility Poles and Fence Posts

Preventative Treatment: Use a 1.0 to 2.0% dilution (See "Rate Determination Guidelines" and "Table 1" for dilution directions). After pole or post hole has been dug, mix the dilution with the soil as it is being replaced to a depth of approximately 10 inches. Place pole or post on top of this layer. The remaining soil fill and termiticide dilution should be mixed while backfilling the hole. The treated soil zone around the post or pole should be approximately 6 inches wide. Soil for the base layer and backfill of each pole or post should be treated at **a** rate of 4 gallons of dilution per 10 cubic feet of soil.

Remedial Treatment: To control existing infestations or to prevent infestation of posts and poles already in place, use a 1.0% to 2.0% dilution. The termiticide dilution should be injected into termite galleries or channels in the wood. For maximum protection, injection sites should be at or below grade.

Posts or poles may also be treated by rodding down to the base of the structure. Rod holes should be placed approximately 3 inches away from the pole and about 6 inches apart. Inject approximately 12 fluid ounces of dilution per foot of depth into each rod hole.

It may be appropriate to use one or both treatment techniques depending upon the specific circumstances at the work site e.g. soil type.

Control of Wood Infesting Insects

Dosage and Mixing Directions
Dursban TC is recommended for use as an aqueous emulsion containing 0.5% to 1.0% chlorpyrifos. See "Table 1" for dilution directions.

Advisements
When spraying overhead interior living areas of homes, apartment buildings, etc., cover surfaces below the area being sprayed with plastic sheeting or other material.

Contact with treated surfaces should be avoided until spray has dried. Cover or remove exposed foods before treatment. Do not use in structures housing animals which are intended for or which produce products to be used for food purposes. Do not use for above ground control of wood infesting insects in food areas of food handling establishments, restaurants or other areas where food is commercially prepared or processed.

To control wood infesting insects **such** as **powder-post beetles** (Lyctidae), **false powderpost beetles** (Bostrichidae), **deathwatch beetles** (Anobiidae), **old house borers** (Cerambycidae) and **ambrosia beetles** (Scolytidae) in homes and other structures, treatments may be applied either as coarse sprays or by brushing the product onto targeted surfaces. Use a sufficient amount of spray to cover the area to the point of wetness but avoiding runoff. Use the following guidelines to determine appropriate rates of application:

New Wood, (typically less than 10 years of age) apply approximately 1 gallon of dilution per 150 square feet as a coarse spray.

Old Wood, (typically greater than 10 years of age) apply approximately 1 gallon of dilution per 100 square feet as a coarse spray.

Treatment Directions
For control of **carpenter ants** in homes and other structures, apply dilution around doors and windows and other places where carpenter ants enter the premises and where they crawl and hide. Also spray into cracks and crevices or through openings or small newly drilled holes into wall voids where these ants or their nests are present. Use a sufficient amount of coarse spray to cover the area to the point of wetness but avoiding runoff.

For control of **termites** (localized areas of infested wood in structures), apply dilution to voids and channels in damaged wood and in spaces between members of a structure and between wood and foundations where termite infestation is likely to occur. Application may be made to inaccessible areas by drilling, and then injecting the emulsion. Use a sufficient amount of spray to cover the area to the point of wetness but avoiding runoff. Treatment of localized areas is intended to kill workers and winged reproductive forms of termites in the treated areas and to prevent infestations for a temporary period. This type of application is not intended to be a substitute for soil treatment or mechanical alteration to control subterranean termites.

Pest Control on Outside Surfaces and Around Buildings

To control **ants, bees, carpenter ants, clover mites, cockroaches, crickets, earwigs, hornets, millipedes, scorpions, spiders, ticks, wa and yellowjackets.**

Outside surfaces: Apply Dursban TC termiticide as a residual spray to outside surfaces of buildings including porches, window frames, eaves, patios, garages, refuse dumps and other areas where pests congregate or have been observed. Treatment may be repeated as needed to maintain effectiveness.

Perimeter sprays: To help prevent infestation of buildings, treat a band of soil and vegetation 6 to 10 feet wide around and adjacent to the building.

Also, treat the building foundation to a height of 2 to 3 feet where pests are active and may find entrance. For **scorpions,** treat or remove accumulations of lumber, firewood, and other materials which serve as insect harborage sites.

Dosage and Mixing Instructions: Use Dursban TC mixed as a 0.25% **to 0.5% dilution** as indicated in the following table:

Gallons of Finished Dilution Desired	Dursban TC Required	
	0.25% Solution	0.5% Solution
1	2/3 fl oz	1 1/3 fl oz
5	3 1/3 fl oz	6 2/3 fl oz
10	6 2/3 fl oz	13 1/3 fl oz
24	16 fl oz	1 qt
48	1 qt	2 qt
97	2 qt	1 gal

Small amounts of solution remaining in the spray tank can be diluted as indicated in the following table and used to treat outside surfaces or perimeter areas:

Concentration of Termiticide Dilution	Amount of Water to Add to Each Gallon of Termiticide Dilution to Provide a 0.25% Spray	Amount of Water to Add to Each Gallon of Termiticide Dilution to Provide a 0.5% Spray
0.75%	2 gallons	0.5 gallon
1.0%	3 gallons	1 gallon

Warranty Disclaimer

Dow AgroSciences warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. Dow AgroSciences MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

it is impossible to eliminate ail risks associated with use of this product Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperature, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, ail of which are beyond the control of Dow AgroSciences or the seller. All such risks shall be assumed by buyer.

Limitation of Remedies

The exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at Dow AgroSciences'election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used

Dow AgroSciences shall not be liable for losses or damages resulting from handling or use of this product unless Dow AgroSciences is promptly notified of such loss or damage in writing. In no case shall Dow AgroSciences be liable for consequential or incidental damages or losses.

The terms of the "Warranty Disclaimer" above and this "Limitation of Remedies" cannot be varied by any written or verbal statements or agreements. No employee or sales agent of Dow AgroSciences or the seller is authorized to vary or exceed the terms of the "Warranty Disclaimer" or this "Limitation of Remedies" in any manner.

"Trademark of Dow AgroSciences LLC

Dow AgroSciences LLC Indianapolis, IN 46268 U.S.A.

Label Code: DO1-021-011
Replaces: 113-52-010

EPA-Accepted 05/20/97

Revisions:

DowElanco notified the EPA that its legal name will change to Dow AgroSciences LLC effective January 1,1998. The following label changes are being made via non-notification as a result of this company name change:-

- Company name changed from DowElanco to Dow AgroSciences LLC (logo, trademark reference, address line, warranty statement)
- Emergency telephone number updated to include a web site address (PR Notice 97-4)

The name of this product and its EPA registration number remain the same. No other changes are being made to the label at this time.

PREMISE® 75

INSECTICIDE IN WATER SOLUBLE PACKETS

Specimen Label

* ***For use by individuals/firms licensed or registered by the state to apply termiticide products. States may have more restrictive requirements regarding qualifications of persons using this product. Consult the structural pest control regulatory agency of your state prior to use of this product.***
* ***For prevention or control of subterranean termites, drywood termites, dampwood termites, carpenter ants, and other wood-infesting insects.***

ACTIVE INGREDIENT:

Imidacloprid,1-[(6-Chloro-3-pyridinyl)methyl]-N-nitro-2-imidazolidinimine	75.0%
INERT INGREDIENTS:	25.0%
Total:	100.0%

Do Not Remove Packets From Container Except For Immediate Use.
Keep water soluble packets in this container and store in a cool dry place but not below freezing (32°F).

EPA Reg. No. 432-1332 **EPA Est. No.**

Stop - Read the label before use.
Keep out of reach of children.

CAUTION

PRECAUCION AL USUARIO: Si usted no puede leer o entender inglÈs, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.
(**TO THE USER:** If you cannot read or understand English, do not use this product juntil the label has been fully explained to you.)

NET CONTENTS:

BACKED by BAYER™

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Harmful if swallowed, inhaled, or absorbed through skin. Causes eye irritation. Avoid contact with skin, eyes, or clothing. Avoid breathing dust or vapor. Wash thoroughly with soap and water after handling.

Remove contaminated clothing and wash before reuse. Keep children or pets away from treated area until dry.

When treating adjacent to an existing structure, the applicator must check the area to be treated, and immediately adjacent areas of the structure, for visible and accessible cracks and holes to prevent any leaks or significant exposures to persons occupying the structure. People present or residing in the structure during application must be advised to remove their pets and themselves from the structure if they see any signs of leakage. After application, the applicator is required to check for leaks. All leaks resulting in the deposition of termiticide in locations other than those prescribed on this label must be cleaned up prior to leaving the application site. Do not allow people or pets to contact contaminated areas or to reoccupy contaminated areas of the structure until the clean up is completed.

Personal Protective Equipment

Pesticide handlers (mixers, loaders, and applicators) must wear long-sleeved shirt and long pants, socks, shoes, and water-proof gloves. After the product is diluted in accordance with label directions for use, shirt, pants, socks, shoes and water-proof gloves are sufficient. In addition: all pesticide handlers must wear protective eyewear when working in a non-ventilated space or when applying termiticide by rodding or sub-slab injection.

FIRST AID	
If swallowed	• Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
If on skin or clothing	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 to 20 minutes. • Call a poison control center or doctor for treatment advice.
If in eyes	• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
In case of emergency call toll free the Bayer Environmental Science Emergency Response Telephone No. 1-800-334-7577. Have a product container or label with you when calling a poison control center or doctor, or going for treatment.	
Note To Physician: No specific antidote is available. Treat the patient symptomatically.	

ENVIRONMENTAL HAZARDS

This product is highly toxic to aquatic invertebrates. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Apply this product only as specified on this label. Extreme care must be taken to avoid runoff. Apply only to soil or other fill substrate that will accept the solution at the specified rate. Do not treat soil that is water-saturated or frozen. or in any conditions where run-off or movement from the treatment area (site) is likely to occur

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Structures that contain wells or cisterns within the foundation of the structure can only be treated using the treated backfill method described in the treatment around wells and cisterns section of this label. Consult state and local specifications for recommended distances of wells from treated area, or if such regulations do not exist, refer to Federal Housing Administration Specifications (H.U.D.) for guidance.

Do not formulate this product into other end-use products.

MIXING TABLE FOR PREMISE 75 INSECTICIDE		
GALLONS OF FINISHED SOLUTION DESIRED	NUMBER OF PREMISE 75 PACKETS NEEDED	
	0.05% Concentrate	0.1% Concentrate
25	1	2
50	2	4
100	4	8

MIXING: Refer to Mixing Table for proper amount of PREMISE 75 Insecticide to be used.

Within each foil envelope are clear inner packets containing PREMISE 75 Insecticide. The clear inner packet is water soluble. Do not allow packets to become wet prior to adding to the spray tank. Do not handle the clear inner packets with wet hands or wet gloves. Rough handling may cause breakage. Reseal foil envelope to protect remaining packets.

To prepare the spray mixture, open the foil envelope and drop the required number of unopened clear water soluble packets into the spray tank while filling with water to the desired level. Operate the agitator while mixing. Depending on the water temperature and the degree of agitation, the packets should be completely dissolved within a few minutes from the time they are added to the water. Cooler water temperatures increase the time needed for the inner packet to dissolve completely.

Note: PREMISE 75 packets should not be used with products or in a tank that may contain boron or release free chlorine. The resultant reaction of PVA and boron or free chlorine is a plastic which is not soluble in water or solvents such as diesel oils, kerosene, gasoline or alcohol. Use of chlorinated water is acceptable.

APPLICATION VOLUME

It is recommended that application volumes described in the PREMISE 75 Insecticide "DIRECTIONS FOR USE" be used whenever possible. However, where soil conditions will not accept application of 4 gallons of PREMISE 75 Insecticide per 10 linear feet, twice the PREMISE concentration may be applied in 2 gallons of solution per 10 linear feet. For example, if 0.05% is the correct use rate to be applied in 4 gallons of water, then 2 gallons of 0.1% dilution may be used per 10 linear feet to deliver an equivalent amount of PREMISE per unit of soil.

CONTROL - GENERAL

Treatment standards for subterranean termite control may vary due to regulations, treatment procedures, soil types, construction practices and other factors. The purpose of chemical soil treatment for termite control is to establish a continuous chemical treated zone (horizontal and/or vertical as needed) between the wood and other cellulose material in the structure and the termite colonies in the soil. Follow all federal, state, and local regulations and treatment standards for protection of a structure from termites. In some instances where an aerial or above ground colony is established, supplemental treatments to control the termites, landscape modifications, and/or structural repairs may be needed to deprive termites of a moisture source. Use a 0.05% to 0.1% dilution based on local recommendations. Generally a 0.05% dilution is used for typical control situations. Where severe or persistent infestations occur, a 0.1% dilution may be used.

PRE-CONSTRUCTION TREATMENT

Do not apply at a lower dosage and/or concentration than specified on this label for application prior to installation of the finished grade.

Prior to each application, applicators must notify the general contractor, construction superintendent, or similar responsible party, of the intended termiticide application and intended sites of application and instruct the responsible person to notify construction workers and other individuals to leave the area to be treated during application and until the termiticide is absorbed into the soil.

CONCRETE SLAB-ON-GROUND OR BASEMENTS: Apply an overall treatment to the entire surface of soil or other substrate to be covered by the slab including areas to be under carports, porches, basement floor and entrance platforms. Apply at the rate of 1 gallon of solution to accurately and uniformly cover 10 square feet. If fill under slab is gravel or other coarse aggregate, apply at the rate of 1.5 gallons or sufficient volume of solution, to accurately and uniformly cover 10 square feet. In addition, apply 4 gallons of solution (see APPLICATION VOLUME) per 10 linear feet to provide a uniform treated zone in soil at critical areas such as along the inside of foundation walls, and around plumbing, bath traps, utility services, and other features that will penetrate the slab.

After completion of grading, make an application by trenching or trenching and rodding around the slab or foundation perimeter. Rodding may be done from the bottom of a shallow trench. When rodding, rod holes should be spaced in a manner that will allow for a continuous chemical treated zone, not to exceed 12 inches, to be deposited along the treated area. Rod holes should not extend below the footing. Apply 4 gallons of solution (see APPLICATION VOLUME) per 10 linear feet, per foot of depth to provide a uniform treated zone. When trenching, the trench along the outside foundation should be about 6 inches in width and 6 inches in depth. Use a low pressure spray (not to exceed 25 PSI at the treatment tool when the valve is open) to treat soil which will be placed in the trench after rodding. Mix the spray solution with soil as it is being placed in the trench. When treating voids in hollow masonry units, use 2 gallons of solution per 10 linear feet of wall. Apply solution so it will reach the footing by injecting into the lower areas of the wall, just above the floor or footing.

When treating foundations deeper than 4 feet, apply the termiticide as the backfill is being replaced, or if the construction contractor fails to notify the applicator to permit this, treat the foundation to a minimum depth of 4 feet after the backfill has been installed. The applicator must trench and rod into the trench or trench along the foundation walls and around pillars and other foundation elements, at the rate prescribed from grade to a minimum depth of 4 feet. When the top of the footing is exposed, the applicator must treat the soil adjacent to the footing to a depth not to exceed the bottom of the footing. However, in no case should a structure be treated below the footing.

Rodding in trench followed by flooding of trench and treatment of backfill may provide a better opportunity to achieve a continuous chemical treated zone than using soil rodding alone to establish a vertical termiticide treated zone.

CRAWL SPACES: Application should be made by trenching or trenching and rodding downward along the inside and outside of foundation walls, around piers, interior supports in contact with the soil, plumbing, and utility services. Apply 4 gallons of solution (see APPLICATION VOLUME) per 10 linear feet, per foot of depth to provide a uniform treated zone. Rodding may be done from the bottom of a shallow trench to top of the footing or a minimum of 4 feet. When rodding, rod holes should be spaced in a manner that will allow for a continuous chemical treated zone to be deposited along the treated area. Rod holes should not extend below the footing. When trenching, the trench should be about 6 inches wide and 6 inches deep. Use a low pressure spray to treat soil which will be placed in the trench, mixing the spray solution with soil as it is being placed in the trench.

HOLLOW BLOCK FOUNDATIONS OR VOIDS: Hollow block foundations or voids in masonry resting on the footing may be treated to provide a continuous chemical treated zone in the voids at the footing. Apply 2 gallons of solution per 10 linear feet to the lower part of the void so that it reaches the top of the footing or soil.

Treatment of voids in block or rubble foundation walls must be closely examined. Applicators must inspect areas of possible runoff as a precaution against application leakage in the treated areas. Some areas may not be treatable or may require mechanical alteration prior to treatment.

All leaks resulting in the deposition of termiticide in locations other than those prescribed on this label must be cleaned up prior to leaving the application site (refer to Precautionary Statements). Do not allow people or pets to contact or to reoccupy the contaminated areas of the structure until the clean up is completed.

POST-CONSTRUCTION TREATMENT

CONCRETE SLAB-ON-GROUND: To apply a treatment under the slab, including attached porches, carports, entrance platforms, garages and similar slab structures, it may be necessary to drill through the slab or exterior foundation. Drill holes should be spaced in a manner that will allow for application of a continuous chemical treated zone. Treat all existing cracks and cold, construction or expansion joints. Also, treat around bath traps, plumbing and utility services which penetrate the slab. Apply 4 gallons of solution (see APPLICATION VOLUME) per 10 linear feet per foot of depth to provide a uniform treated zone. DO NOT MAKE TREATMENT UNTIL LOCATION OF HEAT OR AIR CONDITIONING DUCTS AND VENTS ARE KNOWN AND IDENTIFIED. USE EXTREME CAUTION TO AVOID CONTAMINATION OF DUCTS AND VENTS. Plug and fill all drilled holes in commonly occupied areas with a suitable sealant. Plugs must be of non-cellulose material or covered by an impervious, non-cellulose material.

An application should be made by trenching or trenching and rodding around the outside of the foundation wall. Apply 4 gallons of solution (see APPLICATION VOLUME) per 10 linear feet per foot of depth to provide a uniform treated zone. When trenching, the trench along the outside foundation should be about 6 inches wide and 6 inches deep. Use a low pressure spray to treat soil as it is being placed in the trench.

Rodding can be done from the bottom of a shallow trench. When rodding, rod holes should be spaced in a manner that will allow for a continuous chemical treated zone, not to exceed 12 inches, to be deposited along the treated area. Rod hole depth should not extend below the footing.

BATH TRAPS: Exposed soil or soil covered with tar or a similar type sealant beneath and around plumbing and/or drain pipe entry areas should be treated with 3 gallons of solution per square foot. An access door or inspection vent should be cut and installed, if not already present. After inspection and removal of any wood or cellulose debris, the soil can be treated by rodding or drenching the soil.

CRAWL SPACES: When there is insufficient clearance between floor joists and ground surfaces to allow applicator access, excavate, if possible, and treat according to crawl spaces (refer to Pre-Construction Treatment). If unable to excavate, crawl space soil and wood treatment may be used to prevent surface access by termites. Apply 1 gallon of solution (see APPLICATION VOLUME) per 10 square feet to provide a uniform chemical treated zone. Use a very coarse spray at a pressure not exceeding 25 PSI at the treatment tool when the valve is open.

Where a crawl space cannot be reached with the application wand, use extension wands or other suitable equipment to apply a coarse spray on the soil, wood and structural members contacting the soil at the above rates. Do not apply to inaccessible crawl space areas using pressures greater than 25 PSI at the treatment tool when the valve is open.

Treatment may also be made by drilling through the foundation wall or through the floor above and treating the soil perimeter at a rate of 1 gallon of solution per 10 square feet. Drill spacing must be at intervals not to exceed 16 inches. Many states have smaller intervals so check state regulations which may apply.

To prevent subterranean termites from constructing mudtubes between soil and crawl space wood members above, an overall soil treatment of this product may be applied. Remove all cellulose debris before application. Apply 1 gallon of solution (see APPLICATION VOLUME) per 10 square feet to provide a uniform chemical treated zone.

SHALLOW FOUNDATIONS: For shallow foundations, one foot or less in depth, dig a narrow trench approximately 6 inches wide and deep along the outside and inside of the foundation walls, being careful not to dig below the bottom of the footings. For foundations with exposed footings, dig a trench alongside the footing taking care not to undermine the footing. Apply 4 gallons of solution (see APPLICATION VOLUME) per 10 linear feet to the top of footer to provide a uniform treated zone. The dilution should be applied to the trench and mixed with the soil as it is placed in the trench.

BASEMENTS - OUTSIDE PERIMETER: Along the outside of the exterior walls, an application must be made by trenching or rodding within the trench. Rodding depth should be to the top of the footer, or to a minimum of 4 feet or according to state or local regulations. When rodding through a trench, dig a narrow trench about 6 inches wide and 6 inches deep. Apply 4 gallons of solution (see APPLICATION VOLUME) per 10 linear feet, per foot of depth to provide a uniform treated zone by rodding through the trench. Use a low pressure spray to treat soil which will be placed into the trench after rodding. Mix spray solution with the soil as it is being placed in the trench.

BASEMENTS - INSIDE PERIMETER: If necessary, treat by drilling along the perimeter of the interior walls. Applications also may be necessary around sewer pipes, floor drains, conduits, expansion joints or any cracks or holes in the basement floor. Apply 4 gallons of solution (see APPLICATION VOLUME) per 10 linear feet to provide a uniform treated zone.

Drill holes should be spaced in a manner that will allow for application of a continuous chemical treated zone. Plug and fill all drill holes in commonly occupied areas of the building with a suitable sealant. Plugs must be of non-cellulose material or covered by an impervious, non-cellulose material.

HOLLOW BLOCK FOUNDATION OR VOIDS: Hollow block foundations or voids in masonry resting on the footing may be treated to provide a continuous chemical treated zone in the voids at the footing. Apply 2 gallons of solution per 10 linear feet to the lower part of the void so that it reaches the top of the footing or soil. Drill spacing must be at intervals not to exceed 16 inches. Many states have smaller intervals so check state regulations which may apply.

Treatment of voids in block or rubble foundation walls must be closely examined. Applicators must inspect areas of possible runoff as a precaution against application leakage in the treated areas. Some areas may not be treatable or may require mechanical alteration prior to treatment.

All leaks resulting in the deposition of termiticide in locations other than those prescribed on this label must be cleaned up prior to leaving the application site (refer to Precautionary Statements). Do not allow people or pets to contact or to reoccupy the contaminated areas of the structure until the clean up is completed.

PLENUMS: For plenum-type structures which use a sealed underfloor space to circulate heated and/or cooled air throughout the structure, apply the dilution at the rate of 4 gallons of solution (see APPLICATION VOLUME) per 10 linear feet, per foot of depth of soil to provide a uniform treated zone adjacent to both sides of foundation walls, supporting piers, plumbing and conduits. The soil should be treated by trenching to a depth of 6 inches or trenching and rodding (where conditions permit) or to the top of the footing. When conditions will not permit trenching or rodding, a surface application adjacent to interior foundation walls may be made, but the treated strip shall not exceed a width of 18 inches, horizontally, from the foundation walls, piers or pipes. The surface application will be made at a rate of 1.5 gallons of solution per 10 square feet as a very coarse spray under low pressure (not to exceed 25 PSI when measured at the treating tool when valve is on).

When treating plenums, turn off the air circulation system of the structure until application has been completed and all termiticide has been absorbed by the soil.

TREATMENT AROUND WELLS OR CISTERNS: Do not contaminate wells or cisterns.

Structures With Wells/Cisterns Inside Foundations: Structures that contain wells or cisterns within the foundation of a structure can only be treated using the following techniques:

1. Do not treat soil while it is beneath or within the foundation or along the exterior perimeter of a structure that contains a well or cistern.

The treated backfill method must be used if soil is removed and treated outside/away from the foundation. The treated backfill tech nique is described as follows:

   a) Trench and remove soil to be treated onto heavy plastic sheeting or similar material or into a wheelbarrow.
   b) Treat the soil at the rate of 4 gallons of solution per 10 linear feet per foot of depth of the trench, or 1 gallon per 1.0 cubic feet of soil. Mix thoroughly into the soil taking care to contain the liquid and prevent runoff or spillage.
   c) After the treated soil has absorbed the solution, replace the soil into the trench.

2. Treat infested and/or damaged wood in place using an injection technique such as described in the ìControl of Wood Infesting Pestssection of this label.

Structures With Adjacent Wells / Cisterns and/or Other Water Bodies: Applicators must inspect all structures with nearby water sources such as wells, cisterns, surface ponds, streams, and other bodies of water and evaluate, at a minimum, the treatment recommendations listed below prior to making an application.

1. Prior to treatment, if feasible, expose the water pipe(s) coming from the well to the structure, if the pipe(s) enter the structure within 3 feet of grade.
2. Prior to treatment applicators are advised to take precautions to limit the risk of applying the termiticide into subsurface drains that could empty into any bodies of water. These precautions include evaluat-

ing whether application of the termiticide to the top of the footer may result in contamination of the subsurface drain. Factors such as depth to the drain system and soil type and degree of compaction should be taken into account in determining the depth of treatment.

3. When appropriate (i.e., on the water side of the structure), the treated backfill technique (described above) can also be used to minimize off-site movement of termiticide.

FOAM APPLICATIONS

Construction practices, soil subsidence and other factors may create situations in which a continuous chemical treated zone cannot be achieved using conventional treatment alone. In situations where nec-

MIXING TABLE FOR PREMISE 75 INSECTICIDE FOAM

PREMISE 75 PACKETS[a]	GALLONS OF WATER	FOAM EXPANSION RATIO	FINISHED FOAM	
			(gallons)	(ai%)
ONE	1	25:1	25	0.05
	2.5	10:1		
	5	5:1		
Two	1	50:1	50	
	2.5	20:1		
	5	10:1		

[a] Add the manufacturerís recommended quantity of foam agent to the PREMISE 75 Insecticide solution.

essary, conventional application methods can be supplemented through use of foam generating equipment, or similar devices, to provide a continuous treated zone.

Foam application may be made alone or in combination with conventional application methods, provided that the labeled amount of active ingredient per unit area is used.

Foam Application Use Directions: Mix solution of PREMISE 75 Insecticide with manufacturer's recommended volume of foaming agent (see table for foaming recommendations). Apply a sufficient volume of PREMISE 75 Insecticide foam alone or in combination with liquid solution to provide a continuous treated zone at the recommended rate for specific application sites. Use appropriate dispersion tips and application method for site.

Depending on the circumstances, foam applications may be used alone or in combination with liquid solution applications. Applications may be made behind veneers, piers, chimney bases, into rubble foundations, into block voids or structural voids, wall voids, under slabs, stoops, porches, or to the soil in crawlspaces, and other similar voids.

Foam and liquid applications must be consistent with volume and active ingredient instructions in order to ensure proper application has been made. The volume and amount of active ingredient are essential to an effective treatment. At least 75% of the gallons of Premise 75 must be applied as a typical liquid treatment. The remaining 25% or less gallons is delivered to appropriate locations using a foam application.

CONTROL OF WOOD INFESTING PESTS

For control of above ground termites and carpenter ants in localized areas, apply a 0.05 to 0.1% solution or sufficient volume of PREMISE 75 Insecticide foam to voids and galleries in damaged wood, and in spaces between wooden structural members and between the sill plate and foundation where wood is vulnerable. Applications may be made to inaccessible areas by drilling, and then injecting the suspension or foam with a suitable directional injector into the damaged wood or wall voids. Termite carton nests in building voids may be injected with a 0.05 to 0.1% suspension or foam. Multiple injection points to varying depths may be necessary. It is desirable to physically remove carton nest material from building voids when such nests are found. Application to attics, crawl spaces, unfinished basements, or man-made voids may be made with a coarse fan spray of 0.05 to 0.1% solution or foam to control exposed worker and winged reproductive forms of termites or carpenter ants. This type of application is intended to be a supplemental treatment for control of above ground subterranean termites and carpenter ants.

Use a 0.05% to 0.1% solution to control existing infestations of or to prevent infestation by termites or carpenter ants in trees, utility poles, fencing and decking materials, landscape timbers and similar non-structural wood-to-soil contacts. If possible, locate the interior infested cavity and inject a 0.05 to 0.1% solution or sufficient volume of PREMISE 75 Insecticide foam using an appropriate treatment tool with a splashback guard. These non-structural wood-to-soil contacts may also be treated by applying a solution* to the soil as a spot application or continuous treated zone applied as a drench or by rodding around the base of the point(s) of soil contact(s). Rod holes should be placed approximately 3 inches away from the soil contact point(s) and spaced no more than 12 inches along the perimeter of the soil contact(s). For small poles or posts (< 6 inches in diameter), apply 1 gallon per foot of depth. For larger constructions, apply 4 gallons per 10 linear feet per foot of depth. Retreat as needed to maintain protection.

Termite carton nests in trees may be injected with a 0.05 to 0.1% solution or sufficient volume of foam using a pointed injection tool. Multiple injection points to varying depths may be necessary. Removal of carton material from trees is desirable but may not be necessary when foam application is used. In some instances, a perimeter application of a 0.05% to 0.1% solution applied to soil around the root flare of the tree may be necessary to prevent reinfestation by termites in the soil. For small trees (< 6 inches in diameter), apply 1 gallon of solution. For larger trees, apply 4 gallons per 10 linear feet (measured as the circumference at the root flare).

For protection of firewood or other wood products stored in contact with soil from carpenter ants and termites, treat soil prior to stacking with a 0.05 to 0.1% solution at 1 gallon per 10 square feet to prevent infestation. Curative application to the soil around firewood or other wood products stored in contact with soil may be made as described for non-structural wood-to-soil contacts (above).

Drywood termites and wood-infesting beetles or borers (such as, but not limited to, powder post beetles, anobiid or deathwatch beetles, false powder post beetles, old house borers, wharf borers, or ambrosia or bark beetles). Galleries and structure voids can be treated with sprays, mists, or foams of a 0.05% to 0.1% PREMISE solution. Locate galleries by using visual signs (frass or pellets, blistered wood, emergence or clean out holes), the presence of live insects, mechanical sounding techniques, or listening devices (e.g., stethoscopes, acoustic emission detectors). Penetrate the gallery system by drilling holes to receive the injector tip or treatment tool. Distribute drill holes to adequately cover the gallery system. [**NOTE:** Avoid drilling where electrical wiring, plumbing lines, etc. are located.] Apply PREMISE solutions as a low pressure (about 20 psi) spray or by misting or, where appropriate, by foaming. It is not necessary to treat to the point where runoff is detected from adjacent holes. [**NOTE:** Do not apply where electrical shock hazards exist.] Drill holes should be sealed after treatment. Also, wood surfaces can be sprayed or misted with a 0.05% to 0.1% solution or, where appropriate, use a sufficient volume of foam. For inaccessible surfaces, drill and treat the interior of structural voids. Surfaces treated may include exposed wooden surfaces in crawlspaces, basements, or attics, wooden exterior surfaces such as decks, fencing, or siding, structural voids, channels in damaged wood, in spaces between wooden members of a structure, and junctions between wood and foundations. Apply by brushing or as a coarse, low pressure (about 20 psi) spray to the wood surface; apply sufficient volume to cover the surface to the point of wetness, but avoid applying to the point of runoff. When spraying overhead in living areas, cover surfaces below the treated area with plastic sheeting or similar material. Avoid contact with treated surfaces until spray deposits have dried. Retreat as needed to maintain protection.

Localized treatment for carpenter bees: Apply a 0.05% to 0.1% solution as a spray or mist, or sufficient volume of foam, directly into gallery entrance holes. Following treatment, entrance holes may be plugged with small pieces of steel wool or similar material.

RETREATMENT

Retreatment for subterranean termites can only be performed if there is clear evidence of reinfestation or disruption of the treated zone due to construction, excavation, or landscaping and/or evidence of the breakdown of the termiticide treated zone in the soil. These vulnerable or reinfested areas may be retreated in accordance with application techniques described in this product's labeling. The timing and type of these retreatments will vary, depending on factors such as termite pressure, soil types, soil conditions and other factors which may reduce the effectiveness of the treated zone. Retreatment may be made as either a spot or complete treatment.

When a structure is not known to be reinfested and the treated zone is not disturbed, but where the structure was last treated five or more years ago, retreatment may be performed if, in the judgement of the applicator, it is necessary to ensure adequate protection of the structure. In determining the timing of any retreatment, the applicator should consider efficacy and/or degradation data and/or site-specific conditions and previous experience that indicate a vulnerability of the structure to termite attack.

Annual retreatment of the structure is prohibited unless there is clear evidence that reinfestation or treated zone disruption has occurred.

PERIMETER PEST CONTROL

ANTS: For control of carpenter ants in houses and other structures,

apply a 0.05 to 0.1% solution as a general surface, spot, crack and crevice or wall void application. Apply around doors and windows, eaves and attic vents, and other places where carpenter ants enter the structure, or where they crawl or hide. Spray into cracks and crevices, and spray, mist or foam through small drilled holes into voids where these ants or their nests are present. Apply the volume of spray, mist or foam sufficient to cover the area. Repeat treatments when necessary to maintain control.

For control of carpenter ants tunneling in soil, apply a 0.05 to 0.1% solution as a drench or inject the solution, or sufficient volume of foam, at intervals to establish a continuous treated zone. Establish a uniform treated zone at the edge of walls, driveways or other hard surfaces where ants are tunneling beneath the surfaces.

When the nest site(s) can be located, treat the interior cavity and/or nest site by injecting a 0.05% to 0.1% solution as a spray or mist, or sufficient volume of foam, using an appropriate treatment tool with a splashback guard.

GENERAL PRECAUTIONS FOR APPLICATIONS

After treatment, plug and fill all holes drilled in concrete slab areas of the building with a suitable sealant.

Do not apply solution until location of heat pipes, ducts, water and sewer lines and electrical conduits are known and identified. Caution must be taken to avoid puncturing and injection into these structural elements.

Do not plant for the purpose of consumption, edible plants into the treated areas of soil.

Avoid contamination of public and private water supplies.

Use anti-backflow equipment or an air gap on filling hoses.

Consult State, Federal, or local authorities for information regarding the approved treatment practices for areas in close proximity to potable water supplies.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

Pesticide Storage: Store in a cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, and feed. Do not store below freezing (32°F). Exposure to moisture or excessive handling of water soluble packets may cause breakage. Store water soluble packets in original container and out of reach of children, preferably in a locked storage area.

Handle and open container carefully. Do not cut water soluble packets when opening. If container is leaking or material spilled for any reason or cause, carefully sweep material into a pile. Refer to PRECAUTIONARY STATEMENTS on label for hazards associated with the handling of this material. Do not walk through spilled material. Dispose of pesticide as directed below. In spill or leak incidents, keep unauthorized people away. You may contact the Bayer Environmental Science Emergency Response Team for decontamination procedures or any other assistance that may be necessary. The Bayer Environmental Science Emergency Response Telephone No. is 1-800-334-7577 or contact Chemtrec at 800-424-9300.

Pesticide Disposal: Wastes resulting from the use of this product may be disposed of on site (in the treatment area) or at an approved waste disposal facility.

Container Disposal: Do not use carton in connection with food, feed or drinking water. The empty foil wrappers may be disposed of in the trash. After removing all PVA packets, the carton may be disposed of in the trash.

IMPORTANT: READ BEFORE USE

Read the entire Directions for Use, Conditions, Disclaimer of Warranties and Limitations of liability before using this product.

If terms are not acceptable, return the unopened product container at once. By using this product, user or buyer accepts the following conditions, disclaimer of warranties and limitations of liability.

CONDITIONS: The directions for use of this product are believed to be adequate and should be followed carefully. However, because of manner of use and other factors beyond Bayer Environmental Science's control it is impossible for Bayer Environmental Science to eliminate all risks associated with the use of this product. As a result, crop injury or ineffectiveness is always possible. All such risks shall be assumed by the user or buyer.

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Premise® 75 Insecticide is specially formulated and sold by Bayer Environmental Science USA LP for the control of insects according to the directions on this label. Bayer is the owner of United States patent rights to the active ingredient imidacloprid, formulations containing the active ingredient and methods of use, particularly U.S. Patent Nos. 4,742,060, 6,323,224,B1. The purchase price of Premise® 75 Insecticide includes a royalty whereby the purchaser acquires a prepaid license under which purchase agrees to employ the purchased quantity of Premise® 75 Insecticide only for the above-specified uses under Bayer's United States patent rights and to provide notice of the terms and conditions of this license to any subsequent purchaser. Uses of Premise® 75 Insecticide other than those specified on this label are not licensed through the purchase of this product and the use of this product for other purposes may violate this license and patent rights of Bayer.

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B-9367 081103

Bayer Environmental Science
A Business Group of Bayer CropScience LP

Premise 75 WSP-SL-0803-Eng

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NOTES:

TERMS TO KNOW

Acute Toxicity	a rapid response of the body, often within minutes or hours, to a single sufficiently high exposure of a pesticide or other chemical, and which brings about rapid symptoms of poisoning.
ANSI	a coordinating organization of various trade, technical, professional, and consumer groups who develop voluntary standards for hazardous industrial chemicals.
Chronic Toxicity	injury or illness that can result from repeated exposures, over time, to doses of some pesticides.
Hazard	is the risk of harmful effects from pesticides. The hazard of a pesticide depends on the toxicity of the pesticide (highly toxic, very toxic, slightly toxic) and the length of time, exposure, that the pesticide is in, or, on your body.
Hazardous Substance	any material that poses a threat to human health and/or the environment.
Incompatibility	pesticides that should be kept apart due to hazards involved if they come into direct contact with each other.
OSHA	The federal agency responsible for enforcing the regulations related to safety and health in the workplace.

Physical and Chemical Hazards

This part of the pesticide label will inform you of any special fire, explosion or chemical hazards the product may have. This information is especially valuable when storing pesticides as it will indicate whether the pesticide is likely to explode or burn rapidly if stored near an electric heater or gas furnace. This section will also provide instructions about the best conditions to store the pesticide and if it should be stored apart from other pesticides or chemicals.

Detailed information on physical and chemical hazards, as well as other hazards of pesticides can be found on Material Safety Data Sheets.

Material Safety Data Sheet (MSDS)

If there are pesticides in your workplace, you need to know about **Material Safety Data Sheets.**

Material Safety Data Sheets provide valuable information about pesticide hazards. These sheets are prepared by manufacturers and must be made available to every person selling, storing, or handling pesticides. **YOUR LICENSEE OR SUPERVISOR MUST HAVE A MSDS FOR EACH PESTICIDE YOU HANDLE.**

MSDSs are available for every labeled pesticide and are available from the pesticide manufacturer or pesticide supplier.

MSDSs (see sample MSDS at end of this unit) describe the chemical characteristics of active and other **hazardous** ingredients (some inert ingredients) in a pesticide formulation, and list fire and explosion hazards, health hazards, **incompatibility** characteristics, and types of protective equipment needed for handling the pesticide.

The EPA does not have direct authority over the MSDS. It does not review or approve MSDS's. However, when a MSDS is distributed with a pesticide it becomes part of the pesticide labeling. The OSHA retains full authority over MSDS's.

There is no single form used for the MSDS, so you 'll probably see many types. Their formats and content may vary, but all MSDS's will give you the information you need to work with pesticides safely.

The **Occupational and Safety Administration (OSHA**) recommended MSDS format, containing 8 sections, is the most widely used. However, the **American National Standards Institute (ANSI**) has developed a new 16-section format for preparation of MSDSs.

Pesticide Hazards Information

Several pesticide manufacturers currently use the new **ANSI** format because it is easier to find and use information regarding the potential hazards of pesticides. It is also the form used for instruction in this unit.

OSHA developed the MSDS form as part of the Hazard Communication Standard, or Right to Know regulation. They wanted to make sure you had one easy reference for every sort of information on a hazardous substance.

The sections of the **ANSI** MSDS are discussed below. As you read about the different sections of a MSDS, refer to the **SAGA** insecticide MSDS at the end of this unit.

Here are the sections of the MSDS format.

Section 1.
Chemical Product and Company Identification
The MSDS begins with the pesticide's brand name (same as on its label) plus the name, address, and phone number of the company that makes or distributes the pesticide. The phone number is very useful should you need additional information regarding the pesticide or require assistance in an emergency.

If the active ingredient has a common name, you'll find it in Section 1.

Section 2.
Composition and Information on Ingredients
This section lists any ingredients that **OSHA** has identified as hazardous.

Section 3.
Hazards Identifications
Working with pesticides may present the risk of exposure to that pesticide. The MSDS identifies thes possible health hazards.

Section 3. lists specific possible health hazards that could happen to you if you're exposed to the pesticide.

POSSIBLE HEALTH HAZARDS	
Typical exposure route:	A pesticide can enter your body through contact with your eyes, skin, by inhaling a pesticide vapor, or by ingestion. This may happen when someone handles a pesticide and fails to wash their hands before eating or using tobacco. **Acute health effects:** these show up right after exposure to the pesticide. Examples include eye or skin irritation. **Chronic health effects:** such as cancer or some skin conditions, can result from exposure long ago, or repeated exposures over time.
Length of exposure:	Defines safe exposure limits, without PPE, when handling the pesticide.
Body organs affected:	Medical conditions that can be made worse by exposure, such as high blood pressure or asthma, and how specific organs of the body may be affected.

Section 4.
First Aid Measures
This section provides information on what to do if someone is exposed to the pesticide. The MSDS may suggest basic first aid measures until medical help arrives.

If the pesticide could make an existing medical condition like asthma worse, Section 4.0 will state that, too. If the pesticide is believed to be a carcinogen, that will also be listed.

Section 5.
Fire Fighting Measures
This section explains how likely the pesticide is to catch fire --- and under which circumstances. It may cover the flash point (temperature at which the substance could give off vapors that would burn), reactions that could cause a fire or explosion, and how likely fires are to start or spread quickly.

Section 5.0 also tells you what type of fire extinguisher to use --- ABC, CO2, foam, etc., to put out a fire and if there are any special hazards or fire-fighting procedures to follow.

Section 6.
Accidental Release
This section helps prevent harm to people or the environment in case the substance spills, leaks, or is released into the air. In this section, you will be instructed on how to contain a spill or leak, what cleanup procedures are required, and what safety precautions should be taken.

Section 7.
Handling and Storage
This section provides information on how to handle and store pesticides to reduce the risk of accidents or exposure. Depending on the chemical, it may include tips such as avoiding contact with skin or eyes, using only in a well-ventilated area, or to store in a dry place.

Section 8.
Exposure Controls / Personal Protection
This section focuses on which personal protective clothing and equipment will prevent exposure to the pesticide. It details the eye and face protection (glasses, goggles, face shield, etc.), skin protection (gloves, chemical-resistant suits), and respiratory protection (respirator) you need. Things like taking a shower after working with the pesticide, or washing work clothes may be recommended to lower your risk of exposure to the pesticide.

Guidelines and/or requirements specifying the correct type(s) of protective equipment are found in Section 8. Although not required to be on every label, protective clothing and equipment guidelines are commonly found on an MSDS for the safety of the applicator. The toxicity of the pesticide influences the selection of the protective clothing and equipment.

Section 9.
Physical and Chemical Properties
The physical and chemical properties listed in this section help you identify the type and degree of hazard to the pesticide. Table 7.1 lists some of the physical and chemical properties.

Table 7.1

Physical and Chemical Properties	
Normal appearance	Changes in appearance may indicate decomposition.
Appearance / Odor	Changes in appearance and odor may indicate decomposition. This information will help you recognize anything different and possible dangerous if stored for long periods.
Physical state	Solid, liquid or gas.
Vapor pressure	The higher the vapor pressure, the faster the pesticide will evaporate and put vapors into the air.
Boiling, melting, and freezing points	The temperature at which a potentially dangerous change in the pesticide's state can take place, such as a liquid to a solid or liquid to a gas.
Solubility in water	How much of the pesticide will dissolve in water (insoluble, slightly soluble, or highly soluble.)
Specific gravity or density	Water has a density of 1.0. Pesticides with a density below 1.0 will float on top of the water, and those about 1.0 will sink.
Flammability	Some pesticides catch fire easily. Fire fighting measures may be found in this section.

Section 10.
Stability and Reactivity
Section 10 alerts you to conditions that could cause the chemicals to have a potentially hazardous reaction. You will find out about the pesticide stability, and its incompatibility to other pesticides or to air or water.

Certain pesticides are listed under Stability and Reactivity as "incompatible in alkaline media". This means that a pesticide mixed in water having a pH greater than 7.6, as an example, may result in loss of efficacy and a possible loss of pesticidal activity against pests.

Section 11.
Toxicological Information
This section explains the procedures and results of the pesticide's tests for the pesticide's health hazards.

Section 12.
Ecological Information
This section focuses on the effects of the pesticide when released into the environment. You may learn about the chemical's effect on fish, plants, and birds or how long the pesticide remains hazardous once it's released in the environment.

Section 13.
Disposal Consideration
This section explains how the chemical is classified and identified for proper disposal. Any special instructions or limitations about disposal are provided here.

Section 14.
Transport Information
This section provides essential shipping information. You will find the **Department of Transportation (DOT)** substance name and description, hazard class, identification number, etc.

Section 15.
Regulatory Information
This section discusses **OSHA, US EPA,** or other regulations that apply to the pesticide.

Section 16.
Other Information
The MSDS may contain any other information about the pesticide that could be useful. This may include information on MSDS revisions and on the health, flammability, and reactivity hazards associated with this pesticide.

As can be readily seen, a MSDS can provide significant information that you need to know to work safely with pesticides. *But it can't do it all!* **You** must know where the MSDS's are kept, to read them, and follow their instructions whenever in doubt on how to protect yourself and others**.**

TEST YOUR UNDERSTANDING

MULTIPLE CHOICE

Refer to the **SAGA WP** MSDS to answer questions 7.1 - 7.5.

7.1 The Hazards Identifications section of a MSDS provides information on:

a. essential shipping information
b. compatibility with other pesticides
c. possible health hazards
d. how long the pesticide remains hazardous once it's released in the environment.

7.2 The common name of **SAGA WP** is:

a. carbaryl
b. carbofuran
c. acephate
d. tralomethrin

7.3 Which of the following is a physical property of **SAGA WP** insecticide?

a. has an irritating odor
b. its appearance is a white or beige powder
c. forms very alkaline solution
d. may cause a mild skin rash

7.4 **SAGA WP** insecticide mixed in water will form a:

a. slurry
b. wettable powder
c. suspension
d. paste

7.5 The acute oral LD50 of **SAGA WP** insecticide indicates it is:

a. an extremely hazardous material
b. a carbamate
c. moderately toxic
d. corrosive

FILL-IN THE BLANK

Complete each statement with the appropriate word(s).

7.6 MSDS stands for **M**_____ **S**_____ **D** _____ **S**_____.

7.7 Pesticide manufacturers must provide an MSDS for each _____ .

7.8 Your licensee must have a MSDS for each pesticide you _____.

7.9 You can be exposed to a pesticide by skin or eye contact, swallowing, or _____ the pesticide.

7.10 Always read the _____ _____ _____ _____before starting any job involving a new pesticide or pesticide formulation.

TRUE OR FALSE

Read each question. Decide if the statement is true (**T**) or false (**F**). Circle your answer.

7.11 Pesticide manufacturers are required to report all physical and health hazards of any pesticide they make.
T **F**

7.12 The label and the MSDS will tell you if certain personal protective equipment should be worn when a pesticide is being used.
T **F**

7.13 Each MSDS contains information on emergency first-aid treatment for exposure victims.
T **F**

7.14 Chronic effects from exposure to a pesticide occur immediately.
T **F**

7.15 A MSDS does not provide spill control instructions.
T **F**

Upon completion of each unit in the **Registered Technician Introductory Training Workbook**, the unit must be signed and dated by the designated trainer and the registered technician trainee.

When all units of the **Registered Technician Introductory Training Workbook** are completed by the registered technician trainee, the signature of the licensee at the end of Unit 8 will verify successful completion of the **Workbook**.

_____	_____
Registered Technician Trainee	**Date**
_____	_____
Designated Trainer	**Date**

AgrEvo™

A company of Hoechst and Schering, Berlin

Material Safety Data Sheet

Issue Date: 02/27/96
Supersedes: None

SAGA WP USE DILUTION

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

AgrEvo Environmental Health
95 Chestnut Rid e Road
Montvale, NJ 07645

COMPANY CONTACT: *Regulatory Dept.*
TELEPHONE NUMBER : *(800)438-5837*

EMERGENCY TELEPHONE NUMBER

PRODUCT NAME : *SAGA WP USE DILUTION*
PRODUCT CODE: *NA*
CHEMICAL NAME: *NA*
CHEMICAL FAMILY: *Mixture*
CHEMICAL FORMULA: *Mixture*
EPA REGISTRY NUMBER: 432-755
RTECS NUMBER: *NA*
MSDS IDENTIFICATION CODE/NUMBER : 432755D

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	EXPOSURE LIMITS	CONCENTRATION PERCENT BY WEIGHT
Tralomethrin CAS NUMBER: 66841 -25-6	None established	0.03 to 0.06
Water CAS NUMBER: 7732 -18-5	None established	> 99.0

SECTION 3. HAZARDS IDENTIFICATION

**********EMERGENCYOVERVIEW**********

May be harmful if swallowed. May cause eye irritation. Avoid breathing spray mist. Avoid contact with skin, eyes or clothing.

****

POTENTIAL HEALTH EFFECTS

PRIMARY ROUTE(S) OF ENTRY
Ingestion, skin and eye contact.

EYES
May cause eye irritation.

INGESTION
May be harmful if swallowed.

INHALATION
Not an expected route of entry.

SECTION 4. FIRST AID MEASURES

EYES
Flush eyes with plenty of water.

SKIN
Wash affected areas with soap and water.

SAGA WP USE DILUTION

SECTION 4. FIRST AID MEASURES - Continued

INGESTION
Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.

SECTION 5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES
FLASH POINT: *Nonflammable*

SECTION 6. ACCIDENTAL RELEASE MEASURES

Absorb with suitable material and dispose.

SECTION 7. HANDLING AND STORAGE

HANDLING PRECAUTIONS
A void breathing spray mist. Avoid contact with skin, eyes or clothing. Remove pets and cover fish aquariums and terrariums before application.

STORAGE PRECAUTIONS
Do not store diluted product.

WORK/HYGIENIC PRACTICES
Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OTHER/GENERAL PROTECTION
Safety glasses or goggles and chemical-resistant gloves are recommended.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

BASIC PHYSICAL PROPERTIES
PHYSICAL STATE: *Liquid*
BOILING POINT : *272°F 100°C*
MELTING POINT : *32°F 0°C*
VAPOR PRESSURE : *NA*
VAPOR DENSITY (AIR= 1): *NA*
SPECIFIC GRAVITY :
VOLUBILITY (H20): *Soluble*
PERCENT VOLATILES : *NA*
EVAPORATION RATE: *NA*
pH: *4.7 - 7.0*
VISCOSITY : *NA*

SECTION 10. STABILITY AND REACTIVITY

STABILITY: *Stable*

HAZARDOUS POLYMERIZATION: *Will not occur.*

SAGA WP USE DILUTION

SECTION 11. TOXICOLOGICAL INFORMATION

ACUTE STUDIES
No *acute toxicity information iv available for dilution product. For full toxicological properties of the concentrate - see the concentrate MSDS.*

CHRONIC (CANCER INFORMATION)
CARCINOGENICITY: **NTP :** *No* **IARC :** *No* **OSHA :** *No*

SECTION 12. ECOLOGICAL INFORMATION

OTHER ENVIRONMENTAL INFORMATION
Do not apply directly to water. Use with care when applying in areas adjacent to any body of water. Do not contaminate water when disposing of equipment wash waters.

SECTION 13. DISPOSAL CONSIDERATIONS

Pest Control Operator should handle disposal of material.

SECTION 14. TRANSPORT INFORMATION

PROPER SHIPPING NAME: *Not DOT regulated.*

SECTION 15. REGULATORY INFORMATION

REGULATED INGREDIENTS
INGREDIENT: Tralomethrin
CAS NUMBER: 66841-25-6
PERCENT BY WEIGHT: 0.03 to 0.06
Regulations: Massachusetts Hazardous Substance

SECTION 16. OTHER INFORMATION

HMIS HAZARD RATING - ***HEALTH:*** *1 Slight*
- ***FIRE*** *1 Slight*
- ***REACTIVITY:*** *0 Negligible*
- ***PROTECTION:*** *A*

NFPA HAZARD RATING - ***HEALTH:*** *1 Slight*
- ***FIRE*** *1 Slight*
- ***REACTIVITY:*** *0 Negligible*
- ***SPECIAL:*** *-*

MSDS IDENTIFICATION CODE/NUMBER : 4327550

PREPARED BY: *Regulatory Department* **PHONE :** (800)438-5837

DATE AND TIME OF PRINTING: 05/15/96 14 : 27 : 34

SAGA WP USE DILUTION

SECTION 16. OTHER INFORMATION - Continued

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained therein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

AgrEvo Environmental Health

NOTES:

NOTES:

NOTES:

TERMS TO KNOW

Commercial Certified Applicator	Any structural pest control certified applicator employed by a licensed individual.
Licensee	Any person engaged in the business of controlling, destroying, curbing, mitigating, preventing, repelling, offering advice on control methods and procedures, inspecting and identifying infestations and populations of insects, rodents, fungi, and other pests within, under and on structures of any kind, or the nearby surrounding ground areas or where people may assemble or congregate.
Registered Technician	Any individual who is required to be registered with the Structural Pest Control Division.
CCU	A Continuing Certification Unit (CCU) is a unit of recertification training credit awarded by the Structural Pest Control Committee upon satisfactory completion of one clock hour of instruction in an approved course.
SPCD	The Structural Pest Control Division.
Noncommercial Certified Applicator	A certified applicator not employed by a licensed structural pest control individual.

Purpose of Pesticide and Structural Pest Control Laws

It is essential that pesticides be regulated, in order to protect the public health and welfare and to prevent adverse effect on the environment. The purpose of both federal and state pesticide laws is to regulate the labeling, sale, distribution, storage, transportation, use, application, and disposal of pesticides in the best public interest.

Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)

A law passed by Congress and one of the most important Federal laws that all **registered technicians** should be aware of is the **Federal Insecticide, Fungicide, and Rodenticide Act,** commonly referred to as **FIFRA**. *FIFRA* governs the registration of pesticide products in the United States. No pesticide may be marketed until the EPA reviews an application for registration, approves each use of a pesticide, and assigns a product registration number.

The purpose of this law is protect the public health and the environment. It affects pest control registered technicians and **certified applicators** in several ways. For example, *FIFRA* provides that:

- ❑ all pesticides must be registered by the US EPA prior to sale or use in the United States.
- ❑ all pesticides must be used only as directed on the labeling.
- ❑ pesticides must be categorized either as general-use or restricted-use pesticides.
- ❑ **persons who buy or use restricted-use pesticides must be certified as competent pesticide applicators or must be directly supervised by a certified applicator**,
- ❑ persons who use pesticides in a manner that is *inconsistent with the pesticide labeling are subject to penalties.*
- ❑ States may establish stricter standards governing pesticides than Federal law.

Unless otherwise stated by its labeling, a pesticide shall be considered to be applied under the direct supervision of a certified applicator or licensee if it is applied by a competent person acting under the instructions and control of a certified applicator or licensee who is available if and when needed, even though such certified applicator or licensee is not physically present at the time and place the pesticide is applied.

Failure to comply with Federal or State pesticide laws and regulations will subject the violator to fines and/or imprisonment, as well as possible loss of an applicator's registration, certification or license.

Use Classification Statement

As part of the registration process, FIFRA requires the EPA to classify all pesticides as either restricted use or general use. The classification is based on the potential of the pesticide to cause harm to humans, animals or the environment. Restricted use pesticides have a greater potential for causing harm to the environment than general use pesticides. These pesticides require special care and attention to protect users, the public and the environment. Every pesticide product classified as restricted use must carry the following statement at the top of the front panel of the pesticide label:

> **RESTRICTED USE PESTICIDE**
> **For retail sale to and use only by certified applicators or persons under their direct supervision and only for those uses covered by the certified applicator's certification.**

There may also be a statement giving the reason for the restricted-use classification immediately following the restricted-use statement. For example:

- ❑ **"restricted-use due to ground water contamination"**
- ❑ **"restricted-use due to acute toxicity to humans and birds"**

The purpose of the restricted use classification is to ensure that individuals applying these pesticides receive adequate training and /or supervision. There will be more discussion of this later in this unit.

General-use pesticides may be purchased and used by any responsible individual. They are typically found in garden centers, hardware and home improvement stores. Manufacturers sometimes add other "restrictive" statements to the labels of general use pesticides. These statements include language such as ***for use by professionals only*** or ***professional strength*** Most of these statements are not enforceable and do not affect the sale or use of the product.

Most pesticides that you will use in both household pest (P-phase) and wood-destroying organisms (W-phase) structural pest control are classified as general use. All pesticides used in structural pest control fumigation (F-phase) are classified as restricted-use pesticides due to acute inhalation toxicity of the fumigant gas.

North Carolina Structural Pest Control Law

The North Carolina Structural Pest Control Law (**SPCL**) regulates persons, corporations and firms engaged in structural pest control in the state of North Carolina in order to ensure a high quality of workmanship and in order to prevent deception, fraud and unfair practices. This includes applicators performing structural pest control for hire and on those working on their own property or the property of their employer.

The **SPCL** divides structural pest control into the following three phases according to the type of work performed (*FIFRA* refers to these as applicator categories). A person may be registered, certified or licensed in any or all phases:

Phase P The control of household pests such as cockroaches, fleas, ants, silverfish, carpet beetles, rats, mice, flies, bees, wasps, etc., by any means other than fumigation.

Phase W The control of wood-destroying organisms such as subterranean termites, drywood termites, powderpost beetles, roundheaded borers, flatheaded borers, wood-decay fungi, etc., by any means other than fumigation.

Phase F The control of any structural pest by fumigation; the application of pesticides that kill as a gas. This phase is not required for aerosol insecticides, insecticide fogs or insecticide impregnated strips.

Structural Pest Control Registration, Certification and Licensing

In addition to establishing the three "phases" of structural pest control, the **SPCL** establishes three different types of applicators for which credentials can be obtained. It is important to understand these applicator categories. The structural pest control activities permitted by each category differ considerably. Each category is discussed in detail below.

Registered Technicians

The Registered Technician is the entry level position in structural pest control. Within 75 days of employment, the licensee or certified applicator shall apply to the Structural Pest Control Division for the issuance of a Registered Technician's Identification Card for each employee who is either an estimator, salesman, serviceman, or solicitor. Prior to being eligible for the Registered Technician Identification Card, the applicant must complete the Registered Technician Training Program outlined in the Forward of this workbook. The application must be accompanied by a fee of $25 for each Registered Technician's Identification Card. These cards expire on June 30 each year and are renewable annually for $25.

A licensee or non-commercial certified applicator applying for the issuance or renewal of a Registered Technician's Identification Card for his/her employee must certify to the Division that the employee has completed employee training approved by the Committee in structural pest control work.

It is **unlawful** for a registered technician to perform structural pest control work for the general public unless employed by a structural pest control licensee.

Certification

The North Carolina Structural Pest Control Law and *FIFRA* require the certification of all persons who use or supervise the use of restricted use pesticides in and around structures. A person who performs structural pest control for the general public must obtain a structural pest control license or be employed by a **licensee**. A certified applicator, or registered technician, may **not** perform structural pest control for the general public unless employed by a licensee.

A person cannot perform structural pest control with restricted use pesticides on his/her own property or on property his/her employer controls unless he/she or his/her supervisor is certified. These certified applicators are referred to as **non-commercial certified applicators**. It is **unlawful** for a non-commercial certified applicator to perform structural pest control work for the general public. Certified applicators who are employed by a licensee are called commercial certified applicators and may perform structural pest control work for the general public under the license of their employer.

An applicant who seeks certification must attend the Registered Technician School and demonstrate a practical knowledge of proper pest control techniques by passing both a "core" or general knowledge exam and separate exams for each phase in which certification is desired. The exam is based on study materials produced by North Carolina State University.

The general knowledge standards for certified applicators in all categories include:

- ❑ Label and labeling comprehension
- ❑ Pesticide equipment
- ❑ The impact of pesticides in the environment
- ❑ Application techniques
- ❑ Pesticide safety
- ❑ Federal and State laws
- ❑ Common features of pests

Examinations are administered by the **Structural Pest Control Division** of the North Carolina Department of Agriculture & Consumer Services. An exam fee of $10.00 per phase is charged each applicant. There is no charge for the core exam. You must preregister with the Structural Pest Control Division at least 10 days prior to taking an examination.

After passing the appropriate exam(s), a certified applicator's identification card is issued to the applicant upon payment of $30.00, regardless of the number of phases covered on the card. The certified applicator's identification card expires each June 30 and must be renewed annually to remain in effect. The annual renewal fee is $30.00. If the card is not renewed by December 31, the applicant must retake the core exam and all appropriate phases before a new card will be issued.

Certification training schools are held periodically in Raleigh and throughout the state by the

North Carolina Cooperative Extension Service. Contact your local county extension office, usually located at your county seat, for a training school schedule, or contact:

Pesticide Educational Specialist
North Carolina State University
Department of Horticultural Science
Box 7609
Raleigh, NC 27695-7609
Telephone: (919) 515-3113

Recertification

Once certified, structural pest control applicators are eligible to hold their certification for a five-year period upon payment of annual renewal fees. A certified applicator, at his/her discretion, may be recertified for another five-year period by choosing one of these options:

a) successfully completing a recertification exam for each phase an individual is certified and desires to keep certification.

b) earning Continuing Certification Units (**CCU's**) of formal training approved by the Structural Pest Control Committee and received by the certified applicator during the five years immediately preceding the expiration date of his/her certification.

A CCU means a unit of credit awarded by the Structural Pest Control Division upon satisfactory completion of one clock hour of instruction in an approved course. CCU's cannot be carried forward beyond the five-year recertification period.

NUMBER CCU'S REQUIRED FOR RECERTIFICATION		
NUMBER OF PHASES	TOTAL CCU'S NEEDED	
ONE (1)	10 CCU'S. 5 CCU'S ARE REQUIRED THAT APPLY TO THEP HASE IN WHICH YOU ARE CERTIFIED.	REMAINING 5 CCU'S CAN BE EARNED IN ANY TRAINING PHASE.
TWO (2)	15 CCU'S. 5 CCU'S ARE REQUIRED THAT APPLY TO EACH OF THE 2 STRUCTURAL PHASES YOU HOLD	REMAINING 5 CCU'S CAN BE EARNED IN ANY TRAINING PHASE.
THREE (3)	20 CCU'S. 5 CCU'S ARE REQUIRED THAT APPLY TO EACH OF THE 3 STRUCTURAL PHASED YOU HOLD.	REMAINING 5 CCU'S CAN BE EARNED IN ANY TRAINING PHASE.

NON-COMMERCIAL CERTIFIED APPLICATORS AND LICENSEES MUST EARN AT LEAST ONE OF THE REQUIRED CCU'S IN EACH OF FOUR YEARS OF THE FIVE-YEAR RECERTIFICATION PERIOD.

COMMERCIAL CERTIFIED APPLICATORS MUST EARN AT LEAST ONE OF THE REQUIRED CCU'S IN EACH OF THREE YEARS OF THE FIVE-YEAR CERTIFICATION PERIOD.

The contact for recertification opportunities is:

Certification and Training Coordinator
North Carolina Department of Agriculture & Consumer Services
Structural Pest Control Division
PO Box 27647
Raleigh, NC 27611
Telephone: (919)733-6100

A certified structural pest control applicator or registered technician must follow the appropriate regulations specified by the North Carolina Structural Pest Control Law. An applicator who is adjudged to have violated any part of this Law or who uses a registered pesticide in a manner inconsistent with its labeling shall be guilty of a misdemeanor. For each violation an applicator may be liable for a criminal penalty of not less than $100 but not more than $1,000 and/or shall be imprisoned for not less than 60 days nor more than 6 months. The Committee may also take civil action against a certified applicator as described previously.

Under no conditions shall any certified structural pest control applicator perform pest control work for the general public unless employed by a North Carolina licensed structural pest control operator.

Licensing

An applicant for a license first must be certified in those phases for which a license is desired. The applicant also must document two years of practical experience in the phase or phases of structural pest control in which they wish to become licensed. Normally, this experience is gained as an employee of a licensed structural pest control operator. Under certain conditions, specialized pest control training or an appropriate degree from a college or university may be substituted for part of the practical experience requirement. The Secretary of the Structural Pest Control Committee reviews each license application.

Following approval of the application to take the license examination, the applicant must pass license exam(s) in the desired phases. The examination fee is $25 per phase.

After satisfactorily passing the exam(s), a license can be issued for $125 per year for the first phase and an additional $50 per year for each additional phase. Licenses shall expire on June 30 each year and must be renewed annually by paying the above fee. However, since licensed individuals are also certified, they must also follow recertification requirements.

A licensed structural pest control operator must maintain sufficient financial responsibility coverage. Minimum insurance requirements include property damage of $100,000 and bodily injury of $300,000 for each occurrence or a combined single limit of $300,000. In addition, the licensee must provide satisfactory proof of coverage for any pesticide pollution and contamination of the environment occurring as a result of the use or application of any pesticide. A license expires at the expiration or cancellation of the policy, or upon reduction of the coverage below minimum requirements.

Structural Pest Control Committee

The **SPCL** establishes the Structural Pest Control Committee. The Committee is made- up of nine members. This Committee meets periodically throughout the year to:

- ❑ review settlement agreements of structural pest control applicators who have
- ❑ violated any part of the North Carolina Structural Pest Control Law
- ❑ review structural pest control license applications
- ❑ review recertification training courses
- ❑ conduct administrative hearings
- ❑ adopt or amend structural pest control rules

A structural pest control license, certification or registered technician identification card may be denied, revoked, modified, or suspended for due cause after a majority vote by this Committee after notice and hearing. In addition, the Committee may assess a civil penalty of up to $2,000 against any licensee, certified applicator or registered technician.

In determining the amount of any penalty, the Committee shall consider the degree and extent of harm caused by the violation(s). No civil penalty may be assessed unless the person has been given an opportunity for a hearing before the Committee.

Structural Pest Control Division

Day-to-day administration and enforcement of the Structural Pest Control Law and Rules is provided by the Structural Pest Control Division of the North Carolina Department of Agriculture and Consumer Services. The Division headquarters are in Raleigh, NC, with inspectors working in assigned areas located throughout the state.

In addition to the administration of all examinations mentioned previously, the Structural Pest Control Division performs routine inspections of all structural pest control licensees and non-commercial certified applicators. The Division also investigates all complaints from consumers concerning structural pest control.

Civil Penalties

The Structural Pest Control Committee may revoke or suspend any license, certified application or registered technician card or assess a civil penalty of not more than $2,000 against any person for any one or more of the following causes:

(1) Misrepresentation for the purpose of defrauding; deceit or fraud; the making of a false statement with knowledge of its falsity for the purpose of inducing others to act thereon to their damage; or the use of methods or materials which are not reasonably suitable for the purpose contracted.

(2) Failure of the licensee or certified applicator to give the Committee, the Commissioner, or their authorized representatives, upon request, true information regarding methods and materials used, or work performed.

(3) Failure of the licensee or certified applicator to make registrations herein required or failure to pay the registration fees.

(4) Any misrepresentation in the application for a license or a certified applicator's identification card or registered technician's identification card.

(5) Willful violation of any rule or regulation adopted pursuant to this Article.

(6) Aiding or abetting a licensed or unlicensed person or a certified applicator or a registered technician to evade the provisions of this Article, combining or conspiring with such a licensed or unlicensed person or a certified applicator or registered technician to evade the provisions of this Article, or allowing one's license or certified applicator's identification card or registered technician's identification card to be used by an unlicensed or noncertified person.

(7) Impersonating any state, county or city inspector or official.

(8) Storing or disposing of containers or pesticides by means other than those prescribed on the label or adopted regulations.

(9) Using any registered pesticide in a manner inconsistent with its labeling.

(10) Payment, or the offer to pay, by any licensee to any party to a real estate

transaction of any commission, bonus, rebate, or other thing of value as compensation or inducement for the referral to such licensee of structural pest control work arising out of such transaction.

(11) Falsification of records required to be kept by this Article or the rules and regulations of the Committee.

(12) Failure of a licensee or certified applicator to pay the original or renewal license or identification card fee when due and continuing to operate as a licensee or a certified applicator.

(13) Conviction of a felony or conviction of a violation of G.S.106-65.28 within five years preceding the date of application for a license or a certified applicator's identification card or conviction of any said crimes while such license or card is in effect.

In determining the amount of any penalty, the Committee shall consider the degree and extent of harm caused by the violation(s). No civil penalty may be assessed unless the personhas been given an opportunity for a hearing before the Committee.

Criminal Penalties

Any person performing structural pest control, including licensees, certified structural pest control applicators or registered technicians must follow the appropriate regulations specified by the North Carolina Structural Pest Control Law. An applicator who is ruled to have violated any part of this Law or who used a registered pesticide in a manner inconsistent with its labeling may be convicted of a misdemeanor.

A criminal violation of the North Carolina Structural Pest Control Law subjects the individual to misdemeanor penalties of $100 to $1,000 and/or a 60-day to 6-month imprisonment. As mentioned earlier, the Structural Pest Control Committee may suspend or revoke the person's license by majority vote and may also take civil action against a licensee.

North Carolina Pesticide Law of 1971

While persons doing pest control in and around structures are mainly governed by the North Carolina Structural Pest Control Law of 1955, they must also observe rules of the 1971 Law since it regulates the registration, labeling and disposal of pesticides held for sale in North Carolina.

The North Carolina Pesticide Law of 1971 was designed to regulate, in the publics's interest, the use, application, sale, disposal and registration of insecticides, fungicides, herbicides, defoliants, desiccants, plant growth regulators, nematicides, rodenticides and any other pesticides designated by the North Carolina Pesticide Board.

Therefore, structural pest control operators must handle pesticides in a way consistent with the applicable sections of the 1971 Law.

TEST YOUR UNDERSTANDING

MULTIPLE CHOICE

Select the **best** answer of the 4 choices provided.

8.1 The purpose of *FIFRA* is to:
- a. develop new pesticides
- b. protect the public health and the environment
- c. design safer pesticide formulations
- d. create new and improved pesticide packaging

8.2 Persons who use pesticides in a manner that is *inconsistent with the pesticide labeling:*
- a. will receive a stern warning after the second violation
- b. are subject to penalities which may include fines and imprisonment
- c. will immediately have certification or license cards revoked
- d. must retake and pass certification exams

8.3 Administration and enforcement of the North Carolina Structural Pest Control Law and Rules is provided by:
- a. United States Environmental Protection Agency
- b. FIFRA
- c. the Structural Pest Control Division of the North Carolina Department of Agriculture and Consumer Services
- d. Structural Pest Control Committee

8.4 Restricted use pesticides have a greater potential for causing:
- a. acute heath effects
- b. harm to the environment than general use pesticides
- c. chronic health effects
- d. high insect mortality

8.5 A certified structural pest control applicator may perform pest control work for the general public:
- a. if the pesticides applied to structures are all general use pesticides
- b. only when repellant type pesticides are used to control pests
- c. if s/he holds all 3 certification phases in structural pest control
- d. only if employed by a North Carolina licensed structural pest control operator.

FILL-IN THE BLANK

Complete each statement with the appropriate word(s).

8.6 Persons who buy or use_____ _____ must be certified as competent pesticide applicators or must be directly supervised by a certified applicator.

8.7 The purpose of the restricted use classification is to ensure that individuals applying these pesticides receive _____ and/or _____.

8.8 Certification examinations are administered by the _____ _____ _____ _____.

8.9 The_____ _____ _____ _____ reviews settlement agreements of structural pest control applicators who have violated any part of the North Carolina Structural Pest Control Law.

8.10 The North Carolina Structural Pest Control Law (**SPCL**) _____ persons, corporations and firms engaged in structural pest control in the state of North Carolina

8.11 The SPCL divides structural pest control into the following three phases according to the type of work performed:
1)_____ 2)_____3)_____

8.12 A _____ _____ is any structural pest control certified applicator employed by a licensed individual.

8.13 The Structural Pest Control Division performs _____ inspections of all structural pest control licensees and non-commercial certified applicators.

8.14 Provide an example of a willful violation of the Structural Pest Control Committee Law which may revoke or suspend any license, certified application or registered technician card or assess a civil penalty. Choose example from "**Civil Penalties**".
_____
_____
_____

8.15 Registered technician, certification and license cards expire on _____ each year and must be renewed _____.

TRUE OR FALSE

Read each statement . Decide if the statement is true (**T**) or false (**F**). Circle your answer.

8.16 States may establish stricter standards governing pesticides than Federal law.
T F

8.17 The control of wood-destroying organisms such as subterranean termites, drywood termites, powderpost beetles, etc., requires a P-phase structural pest control license.
T F

8.18 Within 75 days of employment by a licensee or non-commercial certified applicator, each employee who is either an estimator, salesman, serviceman, or solicitor, the licensee or certified applicator shall apply to the Structural Pest Control Division for the issuance of a registered technician's identification card for such employee.
T F

8.19 Restricted-use pesticides may be purchased and used by any responsible individual.
T F

8.20 Structural pest control applicators are eligible to hold their certification for a three-year period upon payment of annual renewal fees.
T F

Upon completion of each unit in the **Registered Technician Introductory Training Workbook**, the unit must be signed and dated by the designated trainer and the registered technician trainee.

When all units of the **Registered Technician Introductory Training Workbook** are completed by the registered technician trainee, the signature of the licensee at the end of Unit 8 will verify successful completion of the **Workbook**.

_____	_____
Registered Technician Trainee	**Date**
_____	_____
Designated Trainer	**Date**
_____	_____
Licensee	**Date**

NOTES:

NOTES:

NOTES:

GLOSSARY

Active Infestation evidence of present activity by that organism, visible in, on, or under a structure, or in or on debris under the structure.

Active Ingredient active ingredient, abbreviated "a.i.", is the material(s) in a pesticide formulation that actually controls (prevents, destroys, repels) the target pest.

Acute Toxicity a rapid response of the body, often within minutes or hours, to a single sufficiently high exposure of a pesticide or other chemical, and which brings about rapid symptoms of poisoning.

ANSI a coordinating organization of various trade, technical, professional, and consumer groups who develop voluntary standards for hazardous industrial chemicals.

Botanical Pesticide a pesticide produced from naturally occurring chemicals found in some plants. Examples are nicotine, pyrethrum, and rotenone.

Carbamate Insecticide one of a class of insecticides derived from carbamic acid.

CCU a Continuing Certification Unit (CCU) is a unit of recertification training credit awarded by the Structural Pest Control Division upon satisfactory completion of one clock hour of instruction in an approved course.

Chemical Name the scientific name(s) of the active ingredient(s) found in the formulated product. The name is derived from the chemical structure of the active ingredient.

Chronic Toxicity injury or illness that can result from repeated exposures, over time, to doses of some pesticides.

Commercial Certified Applicator any structural pest control certified applicator employed by a licensed individual.

Common Name a common chemical name given to a pesticide by a recognized committee on pesticide nomenclature. Many pesticides are known by a number of trade or brand names but have only one recognized common name.

Degradation the breakdown of a pesticide, by environmental factors or microorganisms, into an inactive or less active form(s).

Dermal pertaining to the skin. One of the major ways pesticides can enter the body to possibly cause harm.

Diluent anything used to dilute a pesticide. The most commonly used diluent is water.

Dilute to make less concentrated.

Emulsifier a chemical that aid in suspending one liquid in another.

Emulsion a mixture in which one liquid is suspended as very small drops in another liquid, such as oil in water. As an example, when concentrated pesticide active ingredient is dissolved in an oil then mixed with emulsifiers, they form emulsifiable concentrates. When emulsifiable concentrates are then mixed in water within a spray tank, they form an emulsion. Emulsions are typically milky-white in appearance.

Environment is everything that is around us. It includes all living organisms, such as man and other animals, insects, plants, air, soil, and water. As a registered technician trainee, you must be aware that this definition also includes homes, office, factories, schools, and all that which is contained within these structures.

EPA a Federal government agency responsible for the review of a pesticide manufacturers' application for product registration. The Agency determines that the use of the pesticide will not present an unreasonable risk to humans or the environment.

Exposure coming in contact with a pesticide.

Formulation a mixture of active ingredient(s) combined during manufacture with inert ingredients. The inert ingredients are added to improve the mixing and handling qualities of the pesticide.

Food articles used for food or drink for humans or other animals, including pet food and feed for other domestic animals.

Food Areas this term includes areas for receiving, serving, storage, packaging (canning, bottling, wrapping, boxing), preparing (cleaning, slicing, cooking, grinding).

Food Handling Establishment an area or place other than a private residence in which food is held, processed, prepared, and/or served. Such places includes restaurants, lunchrooms, catering facilities, cafeterias, bars and taverns.

Ground Water ground water is water located beneath the earth's surface. Often, it is water trapped in pools, called aquifers. Ground water is one of the primary sources of water for drinking and irrigation.

Harborage A site where shelter, food and water are available to allow pest populations to thrive.

Hazard is the risk of harmful effects from pesticides. The hazard of a pesticide depends on the toxicity of the pesticide (highly toxic, very toxic, slightly toxic) and the length of time, exposure, that the pesticide is in, or, on your body.

Hazardous Substance any material that poses a threat to human health and/or the environment.

Incompatibility pesticides that should be kept apart due to hazards involved if they come into direct contact with each other.

Inert Ingredient material(s) in a pesticide formulation that are not active ingredients. The inert ingredient(s) are added to dilute the a.i. and improve the mixing and handling qualities of the pesticide. Inert ingredients may be hazardous to humans, animals, and plants.

Inorganic a compound lacking carbon in its structure. Sometimes called "minerals" because they are generally mined from earthen deposits before being refined and formulated for use.

Insecticide a pesticide used for the control of insects. Some insecticides are also labeled for control of ticks, mites, spiders, and other arthropods.

Label the written, printed, or graphic matter on or attached to the pesticide or device or any of its containers or wrappers. This includes label instructions that "refer" the pesticide user to other labeling documents intended for the safe use of the pesticide.

Labeling all labels and all other written, printed, or graphic matter accompanying the pesticide or device at any time or to which reference is made on the label or in literature accompanying the pesticide or device. Labeling is not necessarily attached to or part of the pesticide container.

Leaching the movement of pesticide in water downward through the soil, usually by being dissolved in water, with the possibility of reaching groundwater.

Licensee any person engaged in the business of controlling,destroying, curbing, mitigating, preventing, repelling, offering advice on control methods and procedures, inspecting and identifying infestations and populations of insects, rodents, fungi, and other pests within, under and on structures of any kind, or the nearby surrounding ground areas or where people may assemble or congregate.

Noncommercial Certified Applicator a certified applicator not employed by a licensed structural pest control individual.

Nonfood Areas this term includes garbage room, lavatories, floor drains, offices, locker rooms, machine rooms, boiler rooms, mop closets, and storage areas.

Non-target Organism any plants or animals within a pesticide treated area that are not intended to be controlled by a pesticide application.

Open Porch any porch without fill in which the distance from the bottom of the slab to the top of the soil beneath the slab is greater than 12 inches.

Organism(s) any living thing(s).

Organophosphate a class of insecticides derived from phosphoric acid esters.

OSHA the federal agency responsible for enforcing the regulations related to safety and health in the workplace.

Persistence a pesticide that remains active in the environment for long periods of time because it is not easily broken down by microorganisms or other environmental factors.

Pesticide chemical substances or preparations used to kill, control or manage pest populations.

Pest(s) a pest means any living organism, including but not limited to, insects, rodents, birds, and fungi that:

a) competes with humans and domestic animals for food and water.
b) injures humans, animals, structures, or possessions.
c) spreads disease to humans and domestic animals
d) annoys humans or domestic animals

PPE equipment designed to prevent pesticides from contacting your body or clothing. This equipment also protects your eyes and prevents inhaling pesticides.

Pyrethroid a synthetic (man-made) pesticide that mimics pyrethrin, a botanical pesticide derived from certain species of chrysanthemum flowers.

Registered Technician any individual who is required to be registered with the Structural Pest Control Division.

Registration (federal) A pesticide registered by the US EPA for use in all states.

Registration (state) a pesticide must be registered with the appropriate state agency before it can be sold in the state.

Residue traces of the active ingredient or breakdown product of a pesticide that remain and can be detected in crops, soil, water or the environment following the use of a pesticide.

Resistance the measurable lessening effectiveness of a pesticide as a result of previous exposure(s) of a pest population to that pesticide or related types.

Rinsate the liquid which results from rinsing empty pesticide containers or pesticide spray equipment.

Sensitization substances, such as pesticides, which may cause harmful allergic reactions in certain people to exposures to some pesticides.

Signal Word the word **DANGER**, **WARNING**, or **CAUTION**, that appears on a pesticide label that signifies how toxic the pesticide is and what toxicity category it belongs to.

Slab-on-Ground a concrete slab in which all or part of that concrete slab is resting on or is in direct contact with the ground immediately beneath the slab.

Solution a liquid that contains dissolved substances; (example, table salt dissolved in water).

Solvent a liquid, such as water, kerosene, xylene, or alcohol that will dissolve a substance to form a solution.

SPCD the Structural Pest Control Division.

Structure all parts of a building, whether vacant or occupied, in all stages of construction.

Suspension a substance that contains undissolved particles mixed throughout a liquid; (example, ground pepper mixed with water).

Systemic a chemical, such as a pesticide, that is taken up into the tissues of an organism and transported to other locations where it will affect pests.

Toxicity the potential for a pesticide to cause harm to humans and animals.

Vertebrate(s) animals that have an internal skeleton and segmented spine, such as fish, birds, reptiles, and mammals. Insects have an exoskeleton (the hard covering on the outside of their bodies) with no internal skeleton.

INTRODUCTION

I.1 The best source of information on how to use a pesticide can be found by:
b reading the label

I.2 The directions for use on a pesticide label:
c require that all pesticide use activities be made in strict accordance to the directions

I.3 Who has the responsibility to apply a pesticide according to the directions on the label?
a the applicator of the pesticide

I.4 When using a pesticide, how often should you refer to and "read the pesticide label"?
d as often as necessary to apply the pesticide correctly and safely

I.5 When is it permissible to bury or burn excess pesticide?
c. never

I.6 To comply with the requirements of the RTTP, on-site supervision must be conducted for a minimum of 3 days or until the **Registered Technician Introductory Training Workbook** has been completed.

I.7 The Structural Pest Control Division is the regulatory agency responsible for the administration of the North Carolina **Registered Technician Training Program.**

I.8 Equipment designed to prevent pesticides from contacting your body or clothing is called personal protective equipment or PPE.

I.9 A substance or mixture of substances that is intended to prevent, destroy, repel, or mitigate any pest is called a pesticide.

I.10 A label is the written, printed, or graphic matter on or attached to the pesticide or device or any of its containers or wrappers.

I.11 An EPA registration number must appear on all pesticide labels.

I.12 The pesticide label gives you instructions on how to use the product safely and correctly.

I.13 Failure to apply a pesticide properly can result in legal action against the violator if the instructions on a pesticide label are not followed.

I.14 Pesticide applicators are required by law to comply with all the instructions and directions that appear on a pesticide label.

I.15 The pesticide label is a document which provides instructions on:
- ❑ how to mix the pesticide
- ❑ how to apply the pesticide
- ❑ where not to apply the pesticide
- ❑ the proper storage of the pesticide
- ❑ how to properly dispose of the pesticide container when it is empty
- ❑ how to dispose of excess pesticide
- ❑ what to do in case anyone has been exposed to the pesticide

I.16 An EPA registration number indicates that the pesticide has been registered and its label approved by the EPA.
True.

I.17 The establishment number appears on either the pesticide label or pesticide container.
True.

I.18 The labeling may include brochures, leaflets, and other information that accompanies the pesticide product.
True.

I.19 It is a violation of Federal and State regulations to burn, bury, or dump excess pesticide or pesticide containers.
True.

1.20 The safe use of pesticides can only come through strict adherence to label directions.
True.

UNIT ONE

1.1 Chemicals used in structural pest control are collectively known as:
c. pesticides

1.2 A pesticide manufacturer's primary responsibility to the environment in developing a pesticide is to:
a. ensure the safety of the product under a wide range of environmental conditions

1.3 Pesticides must be registered with the United States:
d. EPA

1.4 Every pesticide label shall bear on the front panel the statement:
b. keep out of reach of children

1.5 To register a pesticide with the US EPA, the manufacturer must:
a. show that the pesticide will have a minimum impact on the environment for the uses intended on the label
b. furnish all experimental data to support its use
c. prove that it can control pests listed on its label
d. all the above

1.6 Safety is the most important factor in pesticide research and development.

1.7 To the manufacturer, the label means the pesticide may be legally sold and distributed in the United States.

1.8 The hazard of a pesticide depends on both the toxicity and the exposure received from the pesticide.

1.9 Label comprehension is the key to ensuring a better understanding of pesticides.

1.10 The potential for a pesticide to cause harm to humans is called toxicity.

1.11 In case of an accident or overexposure, the label identifies the pesticide's active ingredient so medical personnel can provide immediate and proper treatment.

1.12 Regardless of the complexity of the label, it is your responsibility to read and understand the label.

1.13 As a new employee in the structural pest control industry, you should develop the habit of reading the label before:

- ❑ purchasing the pesticide
- ❑ mixing the pesticide
- ❑ applying the pesticide
- ❑ storing the pesticide
- ❑ disposing of the pesticide

1.14 One of the major ways pesticides can enter the body to possibly cause harm is through the skin.

1.15 *"It is a violation of Federal law to use this product in a manner inconsistent with its labeling".* What does this statement mean to you?

If I don't follow the instructions on a pesticide label, I may not satisfactorily control structural pests. I may injure myself or others if I over apply a pesticide or apply it where it should not be applied. In addition, I may have charges brought against me or my employer by the Structural Pest Control Division if I am found guilty of a misuse of the any of the instructions on the label.

1.16 Pesticides control pests.
True.

1.17 Pesticides can be broken down by microorganisms and other environmental factors.
True.

1.18 Pesticides that are slightly toxic will not harm you.
False. Repeated *overexposure* to **any** pesticide, regardless of the level of toxicity (slight, moderate, high), may cause harmful effects.

1.19 Pesticide exposure can be prevented by wearing PPE.
True.

1.20 Label comprehension is the key to ensuring a better understanding of pesticides.
True.

UNIT TWO

2.1 What do **Dursban Pro, Dursban TC, and Dursban 50WP** pesticides have in common?
b. they contain the same active ingredient

2.2 How many of the **Dursban** labels has a US EPA registration number?
d. 3

2.3 **Dursban TC, Dursban Pro and Dursban 50W** are:
a. insecticides

2.4 What statement below is true for the pesticides **Pounce and Prelude**? (see **Table 2.1**)
a. the brand names are different
b. the active ingredient is different
c. the active ingredient is the same
d. both a. and c.

2.5 The name used by pesticide manufacturers to advertise their product is called the:
c. brand name

2.6 The material in a pesticide formulation that actually controls (prevents, destroys, repels) the pest is the active ingredient.

2.7 Every pesticide manufacturer has a brand name for its product.

2.8 It is important to check the active ingredient(s) when comparing pesticides.

2.9 Inert ingredients are added to improve the mixing and handling qualities of the pesticide

2.10 An example of an insecticide active ingredient is chlorpyrifos (or permethrin).

2.11 Two pesticides containing the same active ingredient will always have similar directions for use indoors.
False.

2.12 **Dursban 50W** contains 100% active ingredient.
False.

2.13 Some insecticides labeled for insects also control of ticks, mites, spiders, and other arthropods.
True.

2.14 Pesticides may contain the same active ingredient but in different concentrations.
True.

2.15 Permethrin is a pesticide and an insecticide.
True.

UNIT THREE

3.1 Chemical names on pesticide labels are:
c. long and complex

3.2 Pesticides with different brand names but the same common names will have:
b. the same active ingredient

3.3 A pesticide classified as ”persistent” would:
c. break down slowly

3.4 All pesticides used in structural pest control have:
a. a common name
b. a brand name
c. a chemical name
d. both b. and c.

3.5 **Diazinon** insecticide will exhibit chemical properties that are similar to:
c. malathion

3.6 All registered pesticides have a chemical name (or brand name).

3.7 To comply with **Structural Pest Control Rules & Regulations**, you are required to keep a record of each pesticide applied.

3.8 The chemical name is the complex name on a pesticide label that identifies the chemical components and structure of the pesticide.

3.9 The single-most important decision that you will ultimately face is to determine the right pesticide for your particular pest control situation.

3.10 The organophosphates were the first insecticides to replace the chlorinated hydrocarbons.

3.11 Carbamates have even lower toxicity to mammals than most organophosphates.

3.12 Inorganics are slow killing insecticides that provide a long residual action against a variety of structural pests.

3.13 Pyrethroids are synthesized from the insecticidally active compounds found in pyrethrum.

3.14 Pesticides grouped within classes will exhibit common properties.

3.15 Pyrethrum is the most widely used botanical insecticide in structural pest management.

3.16 When a pesticide is used repeatedly in the same place, against the same pest, the opportunity for resistance decreases.
False.

3.17 Pyrethrum is very toxic to humans.
False.

3.18 All pesticides have a common name.
False.

3.19 Carbaryl is a carbamate insecticide.
True.

3.20 Agricultural pesticides, such as methyl parathion insecticide, are also commonly used in structural pest control.
False.

3.21 Pheromones kill pests.
False.

3.22 Termiticides control cockroaches.
False.

3.23 Rodenticides control mice.
True.

3.24 All insecticides are pesticides.
True.

3.25 All pesticides are insecticides.
False.

UNIT FOUR

WORKBOOK EXERCISE

Formulation	Weight of product (pounds)	Active ingredient	Inert ingredient
FIRE ANT 2.5 G	100.0	2.5	**97.5**
DIAZINON 50 W	5.0	**2.5**	2.5
DURSBAN 1G	10.0	**0.1**	9.9

4-1. A pesticide formulation:
c. consists of active and inert ingredients

4-2. The formulation symbol for emulsifiable concentrate is:
a. E
b. CE
c. EC
d. Both a. and c.

4-3. Which of the following is a true statement regarding pesticides?
c. most pesticides are diluted before use

4-4. Which dry pesticide formulation requires frequent agitation to remain in suspension?
c. a wettable powder

4-5. A microencapsulated pesticide:
c. contains an active ingredient surrounded by a plastic coating

4-6 A pesticide formulation that contains 0.01 percent active ingredient is_____ than one which contains 0.1 percent active ingredient?
c. 10 times less concentrated

4-7 **Ficam D** is:
a. an insecticide
b. a dust formulation
c. a pesticide
d. all the above

4-8 Soluble powders mixed in water form a solution**.**

4-9 Pesticides are available in different forms called formulations**.**

4-10 Every pesticide label must list each active ingredient and show its amount as a percentage by weight on the front panel of the label.

4-11 Hazard is the risk of harmful effects from pesticides and will depend on the particular toxicity of a pesticide and the length of exposure to that pesticide.

4-12 The active ingredient is the chemical in a pesticide formulation which has a specific effect on a pest.

4-13 A pesticide formulation consists of active and inert ingredients.

4-14 Inert ingredients are used in a pesticide formulation to make the pesticide easier to mix **(**and safer to handle).

4-15 Ultra-low-volume concentrates may contain 100% active ingredient.

4-16 WP's mixed in water form suspensions.

4-17 A pesticide formulation containing 55% active ingredient will also contain 45% inert ingredient.

4-18 Inert ingredients in a pesticide formulation are *always* safe and harmless?
False.

4-19 Fungicides control fungi and wood-decaying organisms.
True.

4-20 Applicators must be certified or licensed to apply fumigants.
True.

4-21 A formulation is a convenient form of a pesticide which allows it to be used effectively and safely at a required concentration for a specific pest control purpose.
True.

4-22 Microencapsulated pesticides can be applied in a dry form without mixing in water.
False.

4-23 Aerosols contain a high percentage of active ingredient(s)
False.

4-24 A repellent is not considered a pesticide.
False.

4-25 All pesticide active ingredients are completely soluble in water.
False.

WORKBOOK EXERCISE

4-26 What is the common name of this product?
Cypermethrin**.**

4-27 What type of pesticide formulation is **Cynoff WSB**?
Wettable powder.

4-28 How much active ingredient is contained in **Cynoff WSB**?
35.6%.

4-29 What part of the **Cynoff WSB** product is water soluble?
The clear water soluble bags.

4-30 How much formulation is contained in each water soluble bag of Cynoff WSB?
0.33 ounces of Cynoff WP.

UNIT FIVE

5.1 Some pesticide labels bear a **WARNING** statement. What does this mean to you?
c. the product requires that I exercise greater care in its use than a product with a **CAUTION** signal word.

5.2 What two factors determine the hazard of a pesticide to the applicator?
c. toxicity of the pesticide and the length of exposure to the pesticide.

5.3 **DANGER** on a pesticide label means:
d. the product is highly toxic to humans.

5.4 The statement **"Keep Out of Reach of Children"** appears on the labels of all pesticides.
a. highly toxic
b. moderately toxic
c. slightly toxic
d. all of the above

5.5 A pesticide label with a **CAUTION** signal word means the pesticide:
d. is relatively non-toxic to humans

5.6 The signal word provides the pesticide user with an *indication* of the relative toxicity of the formulated product to humans and animals.

5.7 If a specific reentry period is not noted on the pesticide label, surfaces treated with liquids must dry or dusts and mists must settle out of the air before allowing other people or pets to enter the area, without protective clothing.

5.8 In the event of suspected poisoning from exposure to a pesticide, you must follow the label's first aid advice and then immediately call a physician.

5.9 Pesticide absorption through the skin is the most common cause of poisoning that can occur during mixing, loading, applying, and cleaning of pesticide equipment.

5.10 List the four ways pesticides can contact your body:
Getting pesticide on your skin
Swallowing a pesticide
Inhaling a pesticide
Getting pesticide into the eyes

5.11 The word **WARNING** indicates that the product is likely to cause acute illness from oral, dermal, or inhalation exposure.

5.12 When in doubt regarding the proper storage of structural pesticides, contact the Structural Pest Control Division.

5.13 The "Note to Physicians" provides emergency medical personnel with poison treatment information.

5.14 The signal word on a pesticide label indicates the hazard to you of any active ingredients, solvents, or inert ingredients contained in the formulation.

5.15 The higher the LD50 rating, the _____ (lower) the toxicity of a pesticide.

5.16 The terms hazard and toxicity have the same meaning.
False.

5.17 Proper disposal of unused pesticides and pesticide containers is essential to reduce human and environmental hazards.
True.

5.18 Unlike humans, most animals are not susceptible to pesticide injury.
False.

5.19 The two types of toxicity to pesticides are acute and severe.
False. Acute and chronic.

5.20 Pesticide absorption through the eyes (ocular exposure) is the most common cause pesticide exposure during mixing, loading, applying, and cleaning of pesticide equipment
False.

5.21 Pesticides that bear a **Danger** or **Warning signal** word will control a greater variety of pests than a pesticide with a **Caution** signal word.
False.

5.22 Acute toxicity is used to describe the potential long term effects which could result from exposure to small amounts of a toxin over time.
False.

5.23 Overexposure can result from improper use of a pesticide.
True.

5.24 The **Statement of Practical Treatment** provides the pesticide user with information regarding the potential toxicity, irritation and sensitization hazard associated with the use of a pesticide.
False.

5.25 In the event of suspected poisoning from exposure to a pesticide, you must immediately induce vomiting of the victim.
False.

5.26 Does the pesticide label contain all the instructions and directions for use that you need to use the product safely and legally? Explain
A. Some pesticide products have all the necessary instructions and directions for use on the product label. For other products, more instructions and directions may be in other labeling that accompanies the product at the time of purchase. The label or labeling of other products may refer to separate documents that contain specialized instructions and directions. Pesticide users are required by law to comply with all of these types of instructions and directions — not just with the label itself.

5.27 What is the meaning of the statement: "It is a violation of Federal law to use this product in a manner inconsistent with its labeling"?
A. It is illegal to use a pesticide in any way not permitted by the labeling. A pesticide may be used only on the sites named in the directions for use. You may not use higher dosages, higher concentrations, or more frequent applications. You must follow all directions for use, including directions concerning safety, mixing, diluting, storage, and disposal. You must wear the specified personal protective equipment even though you may be risking only your own safety by not wearing it.

5.28 What types of hazard statements should you look for on the pesticide labeling?
A. You should look for precautions about hazards to humans (and domestic animals), environmental hazards, and physical/chemical hazards.

5.29 Name and explain the meaning of the signal words and symbols you may see on a pesticide product.
A. **"CAUTION"** indicates that the pesticide product is slightly toxic or relatively nontoxic. **"WARNING"** indicates that the pesticide product is moderately toxic. **"DANGER"** indicates that the pesticide product is highly toxic. "Poison" and the "skull and crossbones" indicates that the pesticide product is highly toxic as a poison, rather than as a skin or eye irritant.

5.30 Explain the differences between chemical name, common name, and brand name. Which of these terms should you use to most accurately identify a pesticide product?
A. The chemical name is a complex name that identifies the chemical components and structure of the pesticide. A common name is a shorter name that is officially recognized by EPA as a substitute forthe chemical name of a pesticide. A brand name is the name --- usually a trademark — used by a chemical company to identify a pesticide product. The common name (or the chemical name, if no common name is given) is the most accurate and useful way to identify a pesticide product.

5.31 Explain the differences between the terms "label" and "labeling."
A. The label is the information printed on or attached to the pesticide container. Labeling includes the label, plus all other product information received from the manufacturer when you buy it.

UNIT SIX

6.P.1 **Dursban Pro** is equally toxic to birds and fish.
False. Under the **"Environmental Hazards"** section, it reads "this pesticide is toxic to birds and wildlife and extremely toxic to fish and aquatic organisms.

6.P.2 What type of pesticide formulation is **SAGA WP?**
A wettable powder.

6.P.3 What type of pesticide formulation is **Dursban Pro**?
An emulsifiable concentrate.

6.P.4 **Dursban Pro** may be used indoors as a space spray.
False.

6.P.5 The common name of **SAGA WP** is tralomethrin.

6.P.6 To minimize airborne particles with Dursban Pro, spray pressure should be at least 60 psi.
False.

6.P.7 Give a specific area of a house where a respirator must be worn when applying **Dursban Pro**.
Crawlspace or any confined area.

6.P.8 **Dursban Pro** may not be applied within pet stores and kennels.
False. These areas are not excluded by the label as possible treatment sites.

6.P.9 For general pest control indoors, what dosage rates are permitted by the **Dursban Pro** label?
Applications of 0.25% to 0.5%.

6.P.10 To prepare a 0.5% emulsion of **Dursban Pro** requires:
b. 2 and 2/3 fluid ounces of **Dursban Pro** for each gallon of water

6.P.11 Ten level "scoopfuls" of **SAGA WP** contains how much product?:
c. 1.0 ounce

6.P.12 Prior to applying **SAGA WP** to carpet for control of fleas, what is recommended be done first?
Thoroughly vacuum.

6.P.13 Dursban Pro may be used on ornamentals?
True.

6.P.14 Following an application of **Dursban Pro** to carpet for control of fleas indoors; the carpet is dry to the touch after 1 hour. You can safely return pets to the treated area.
False. According to the label, you **must** wait a minimum of 4 hours **and** until the spray has dried.

6.P.15 You can use **Dursban Pro** in ULV application equipment.
False. The label states not to use **Dursban Pro** in fogging equipment.

6.P.16 Saga WP may not be applied within cabs, trains or planes**.**
False. The insecticide label permits use on "various modes of transportation".

6.P.17 The active ingredient in **Dursban Pro** is:
chlorpyrifos.

6.P.18 Dursban Pro may be applied to pets for control of fleas, ticks, and lice.
False. "DO NOT TREAT PETS WITH THIS PRODUCT".

6.P.19 Describe how to make a "stable emulsion" of **Dursban Pro**?
First add one-half the required amount of water to the spray tank followed by adding the proper amount of Dursban Pro. Close the tank and agitate for 5 to 10 seconds. Then add the remaining water to the tank being careful to avoid over-agitation that may result in excess foaming.

6.P.20 Applications of Dursban Pro are **not** permitted in nursing homes for the elderly.
False. The label does not prohibit its use at this treatment site.

6.P.21 High volume broadcast spray mixtures of **Dursban Pro** can be applied as a perimeter treatment at the rate of 1 gallon per 100 square feet of surface.
True.

6.P.22 Crack & crevice application of **SAGA WP** is permitted in non-USDA inspected facilities when the facility is in operation.
True, provided exposed food/feed is covered or removed from the area being treated prior to application.

6.P.23 Unopened or half-empty containers of **Dursban Pro** insecticide can be wrapped in paper and disposed as regular trash.
False. Excess pesticide remaining from the use of this product should be disposed of on site according to label directions or at an approved waste disposal facility.

6.P.24 Dursban Pro applied as an outside foundation spray will not harm foundation plants
False. Both environmental factors and differences in plant susceptibility may affect phytotoxic expressions (damage to plants leaves, fruit and flowers) when treated with **Dursban Pro**.

6.P.25 Following the directions on the **Dursban Pro** label, how many gallons of spray mixture is needed to treat a 16' X 18' living room for carpet beetles indoors?
d. a specific amount is not specified on the label

6.P.26 Which pesticide cannot be tank mixed with **Dursban Pro?**
dichlorvos (DDVP)

6.P.27 Dursban Pro may be used to control ants, millipedes, and spiders in vegetable gardens.
False. "Do not treat vegetable gardens" with this product.

6.P.28 To make a 0.03% spray mixture of **Dursban Pro** to control cockroaches outdoors, add 1 and 2/3 fluid ounces of formulation per gallon of water.
False. To make a 0.03% water based spray, add 1 2/3 fl oz Dursban Pro per 10 gallons of spray.

6.P.29 SAGA WP forms a suspension when mixed with water.
True.

6.P.30 In case of an emergency spill of **Dursban Pro**, who should you call? Provide the phone number.
DowElanco (now called DowAgrosciences). 517-636-4400 (collect)

6.P.31 Dursban Pro has a higher potential health hazard than **SAGA WP**?
False. **Dursban Pro** insecticide carries a **CAUTION** signal word, while SAGA WP carries a **WARNING** signal word. Therefore, the *potential* for harmful effects from exposure to **SAGA WP** is more likely.

6.P.32 The environmental hazards of **SAGA WP** and **Dursban Pro** to fish are identical.
True.

6.P.33 How soon after application of **SAGA WP** to indoor carpets can pets be allowed to enter the treated site?
A specific time is not stated. It is your responsibility; however, to ensure the treated site is adequately dry to prevent pesticide exposure to pets.

6.P.34 SAGA WP may be mixed with IGR's?
True.

6.p.35 SAGA WP may be used in commercial greenhouses or nurseries for German cockroach control?
False. "Not For Use in Commercial Greenhouses Or Nurseries".

6.W.1 While applying **Dursban TC** to a ventilated crawlspace, you must wear:
- ❑ long-sleeved shirt
- ❑ long pants
- ❑ socks
- ❑ shoes
- ❑ chemical-resistant gloves

6.W.2 The active ingredient in **Dursban TC** and **Premise 75** are identical?
False. The active ingredient in **Dursban TC** is chlorpyrifos and the active ingredient in **Premise 75** is imidacloprid.

6.W.3 Dursban TC can be used indoors for carpenter ant control?
False. It may be used only on outside surfaces and around buildings.

6.W.4 Structures that contain wells or cisterns must not be treated with **Premise 75**.
False. You must not treat the soil beneath structures that contain wells or cisterns by rodding or drenching with termiticide; however, you are allowed by the label to remove the soil, treat it according to label directions, and then replace the soil.

6.W.5 Prior to installation of finished grades on preconstruction structures, application of **Dursban TC** or **Premise 75** at a lower dosage and/or concentration than specified on their respective labels is permitted.
False.

6.W.6 Hollow block foundations or voids of masonry can be treated with **Dursban TC** at a rate of 0.5 gallons per 10 linear feet.
False. Apply **Dursban TC** at the rate of 2 gallons of emulsion per 10 linear feet of footing.

6.W.7 Adding 1 gallon of **Dursban TC** to 47 gallons of water yields a 1.0% dilution.

6.W.8 Adding 4 **Premise 75** packets to 50 gallons of water yields what concentration?
0.1%

6.W.9 To establish vertical barriers, apply **Dursban TC** or **Premise 75** at 4 gallons of dilution per 10 linear feet per foot of depth.
True.

6.W.10 What is considered by the **Dursban TC** label to be a "*post-construction application"*
Applications made after the final grade is installed.

6.W.11 A one square foot bath trap will usually require about 3-5 gallons of **Dursban TC** dilution for thorough and complete coverage.

6.W.12 People residing in the structure *during* application of **Dursban TC** must be advised to leave.
False. The applicator is required to check for leaks following treatment. If any leaks are found, then the applicator must advise occupants and their pets to remove themselves from the structure.

6.W.13 The purpose of anti-back flow equipment is to:
Prevent pesticide from being siphoned from the spray tank back into the water supply.

6.W.14 Under what conditions is an annual retreatment with **Dursban TC** and **Premise 75** allowed by their labels?
When there is clear evidence of termite reinfestation or the treated zone has been disrupted due to construction, excavation, or landscaping.

6.W.15 Treatment drill holes in basement areas are required to be plugged following application of **Dursban TC or Premise 75**.
True.

6.W.16 Describe/explain a "plenum type structure"?
A sealed under-floor space used to circulate heated and/or cooled air throughout the structure.

6.W.17 Firewood may be directly treated with **Premise 75** for control of carpenter ants?
False. "Treat soil beneath firewood prior to stacking".

6.W.18 **Premise 75** is labeled for control of powderpost beetles and old house borer?
False. "For control of above ground termites and carpenter ants in *localized areas".*

6.W.19 How many gallons of diluted **Dursban TC** or **Premise 75** is required to establish vertical barriers to the outside and inside foundations walls of a 30 ' X 50' existing structure where the footing is 12 inches deep?
128.

6.W.20 Using the above example, how much diluted **Dursban TC** or **Premise 75** is required where the footing is 24 inches deep?
256.

6.W.21 According to the **Dursban TC** label, this pesticide is extremely toxic to what type of organisms?
Aquatic invertebrates, such as fish, shrimp, crabs, crawfish, etc.

6.W.22 After application of **Dursban TC** to an existing structure, what are you are required to do?
Check for leaks of termiticide.

6.W.23 To apply a post-construction termiticide treatment of **Premise 75** under a concrete slab, what is the *recommended* spacing of the drill holes?
"Drill holes should be spaced in a manner that will allow for application of a continuous chemical treated zone."

6.W.24 List 2 (two) environmental conditions whereby the application of **Dursban TC** or **Premise 75** is prohibited?
Water-saturated or frozen soil which will accept little or no solution.
NOTE: Structural Pest Control Division regulations require vertical drilling where concrete slabs are over dirt filled areas to be spaced at no more than 12-inch intervals

6.W.25 Describe the proper spray tank mixing directions for **Dursban TC**.
a. fill spray tank 1/4 to 13/ full of water.
b. start pump to begin by-pass agitation and place end of treating tool in spray tank to allow circulation through hose.
c. add pesticide.
d. add remaining amount of water.
e. let pump run and allow recirculation through the hose for 2-3 minutes.

6.W.26 According to **Dursban TC** or **Premise 75** label, if soil will not accept the labeled application volume of 4 gallons termiticide/10 linear foot, such as in heavy, clay-type soils, what is recommended by the labels?
Dursban TC: The volume may be reduced provided there is a corresponding increase in concentration so that the amount of active ingredient applied to the soil remains the same.
Premise 75. Twice the **Premise 75** concentration may be applied in 2 gallons of solution per 10 linear feet. For example, if 0.05% is the correct use rate to be applied in 4 gallons of water, then 2 gallons of 0.1% dilution may be used per 10 linear feet to deliver an equivalent amount of **Premise 75** per unit of soil.

6.W.27 **Dursban TC** and **Premise 75** are :
a. termiticides
b. insecticides
c. pesticides
d. all the above

6.W.28 According to the **Dursban TC** label, how do you treat a shallow foundation of 1 foot or less?
Dig a narrow trench approximately 6 inches wide along the outside of the foundation walls. Do not dig below the bottom of the footings. The termiticide dilution should be applied to the trench and mixed with the soil as it is replaced in the trench.

6.W.29 When rodding termiticide in hard, dry soils, very high pressure (75-125 psi) will force the termiticide into the soil and allow for good vertical penetration**.**
False. Hard, dry soils should be injected with termiticide using low pressures (25 psi or less) This will typically allow for good lateral (horizontal) dispersion and help to avoid backsplashing from the injection hole, backflow from cracks and expansion joints, and adjacent drill holes.

6.W.30. Give examples of "critical areas" of a structure when treating for subterranean termites?
- ❑ plumbing and utility entry sites,
- ❑ bath traps
- ❑ expansion joints
- ❑ foundation cracks
- ❑ and any area with known or suspected termite infestations.

6.W.31 Provide an example of a "highly absorptive soil"?
A highly absorptive soil contains large pore spaces. Examples are gravel or coarse sand.

6.W.32 Which of the labels, **Dursban TC** or **Premise 75**, prohibits "use in voids insulated with rigid foam".
Dursban TC.

6.W.33 Adding one **Premise 75** packet to 2.5 gallons of water in a foam generator will result in an expansion ratio of:
10:1

6.W.34 Preconstruction subterranean termite treatments should be made after grading is completed and prior to the pouring of the slab.

6.W.35 To establish a preconstruction vertical barrier termite treatment, the termiticide must be applied to soil at a rate of 1 gallon dilute termiticide per 10 square feet.
TRUE

UNIT SEVEN

7.1 The Hazards Identifications section of a MSDS provides information on:
c. possible health hazards

7.2 The common name of **SAGA WP** is:0
d. tralomethrin

7.3 Which of the following is a physical property **of SAGA WP** insecticide?:
b. its appearance is a white or beige powder

7.4 SAGA WP insecticide mixed in water will form a:
b. wettable powder

7.5 The acute oral LD50 of **SAGA WP** insecticide indicates it is:
c. moderately toxic

7.6 **MSDS** stands for **M**aterial **S**afety **D**ata **S**heet.

7.7 Pesticide manufacturers must provide an MSDS for each pesticide.

7.8 Your licensee must have a MSDS for each pesticide you handle, use, apply.

7.9 You can be exposed to a pesticide by skin or eye contact, swallowing, or inhaling the pesticide.

7.10 Always read the Material Data Safety Sheet before starting any job involving a new pesticide or pesticide formulation.

7.11 Pesticide manufacturers are required to report all physical and health hazards of any pesticide they make.
True.

7.12 The label and the MSDS will tell you certain personal protective equipment should be worn when a pesticide is being used.
True.

7.13 Each MSDS contains information on emergency first-aid treatment for exposure victims.
True.

7.14 Chronic effects from exposure to a pesticide occur immediately.
False. Chronic effects from exposure to pesticide is an injury or illness that can result from repeated exposures, over time, to doses of some pesticides.

7.15 A MSDS does not provide spill control instructions.
False. Sections 6 and 13 of a MSDS will provide information on accidental release and disposal considerations.

UNIT SEVEN

8.1 The purpose of *FIFRA* is to:
b. protect the public health and the environment

8.2 Persons who use pesticides in a manner that is *inconsistent with the pesticide labeling:*
b. are subject to penalities which may include fines and imprisonment

8.3 Administration and enforcement of the North Carolina Structural Pest Control Law and Rules is provided by:
c. the Structural Pest Control Division of the North Carolina Department of Agriculture and Consumer Services

8.4 Restricted use pesticides have a greater potential for causing:
b. harm to the environment than general use pesticides

8.5 A certified structural pest control applicator may perform pest control work for the general public:
d. only if employed by a North Carolina licensed structural pest control operator.

8.6 Persons who buy or use restricted-use pesticides must be certified as competent pesticide applicators or must be directly supervised by a certified applicator.

8.7 The purpose of the restricted use classification is to ensure that individuals applying these pesticides receive adequate training and /or supervision.

8.8 Certification examinations are administered by the Structural Pest Control Division

8.9 The Structural Pest Control Committee reviews settlement agreements of structural pest control applicators who have violated any part of the North Carolina Structural Pest Control Law.

8.10 The North Carolina Structural Pest Control Law (**SPCL**) regulates persons, corporations and firms engaged in structural pest control in the state of North Carolina.

8.11 The SPCL divides structural pest control into the following three phases according to the type of work performed:
1) P-phase 2) W-phase 3) F-phase

8.12 A commercial certified applicator is any structural pest control certified applicator employed by a licensed individual.

8.13 The Structural Pest Control Division performs routine inspections of all structural pest control licensees and non-commercial certified applicators.

8.14 Provide an example of a willful violation of the Structural Pest Control Committee Law which may revoke or suspend any license, certified application or registered technician card or assess a civil penalty.
Registered Technician chooses answer from 13 possible violations of the SPCL.

8.15 Registered technician, certification and license cardsl expire on June 30 each year and must be renewed annually.

8.16 States may establish stricter standards governing pesticides than Federal law.
True.

8.17 The control of wood-destroying organisms such as subterranean termites, drywood termites, powderpost beetles, etc., requires a P-phase structural pest control license.
False. The control of wood-destroying organisms requires a W-phase structural pest control license.

8.18 Within 75 days of employment by a licensee or non-commercial certified applicator of an employee who is either an estimator, salesman, serviceman, or solicitor, the licensee or certified applicator shall apply to the Structural Pest Control Division for the issuance of a registered technician's identification card for such employee.
True.

8.19 Restricted-use pesticides may be purchased and used by any responsible individual.
False. Persons who buy restricted-use pesticides must be certified pesticide applicators or must be working under the direct supervision of a certified applicator and only for those uses covered by the certified applicator's certification.

8.20 Structural pest control applicators are eligible to hold their certification for a three-year period upon payment of annual renewal fees.
False. Structural Pest Control certification is for a 5-year period.