Study Manual for Private Applicator Certification

DAIRY

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Preface

Any person who uses restricted-use pesticides must be licensed in order to be able to purchase such products. Licensing is not required if only general-use pesticides are used, with the exception of commercial applications.

Any person who sprays another's property in exchange for money must possess a commercial applicator's license. However, individuals that are licensed as a private applicator can spray another's property in exchange for services. (i.e.; he might trade a spray job in the spring for help with harvest in the fall)

A farmer wishing to use restricted-use pesticides would apply for a "private applicator's license." The private applicator may then buy and apply restricted-use pesticides on their own farm, property they rent or on the farms of others, provided that they do not get paid to do so.

It is not necessary for the licensed private applicator to actually perform all pesticide applications. An employee or family member can apply pesticides, however, the license holder is responsible for training the person who actually does the work, and must be available if needed.

Private applicators are required to maintain records with respect to each use of restricted-use pesticide and must file a report of their usage on or before January thirty-first each year for the previous year's applications.

This booklet was prepared as a study guide for those individuals seeking certification as private applicators in Connecticut. It contains brief descriptions of the major pests of each crop, their life cycles and the damage they cause to the host plants.

As a minimum requirement for certification, a private applicator must show that they possess a practical knowledge of laws pertaining to pesticide applications and the pest problems associated with their farming operation. This practical knowledge includes ability to recognize common pests and damage caused by them. Recognition is critical because it is the first step in control. The private applicator must be able to recognize the pest problem before they select among the available pesticides.

This booklet is not to be considered a complete source of information. Information on integrated pest management (IPM) and suggested spray schedules may be obtained from the Connecticut Cooperative Extension Service or Connecticut Agricultural Experiment Station.

Insects

Cattle Lice

Description

Cattle lice are small, wingless, soft bodied, somewhat flattened insects, varying in color from light-gray to bluish-gray.

There are two kinds of lice that infest cattle: sucking lice and biting lice. Sucking lice feed by piercing the animal's skin and drawing blood. Biting lice do not pierce the skin: they feed on bits of hair or skin.

Life Cycle

The life cycle is generally the same for both sucking and biting lice. They begin to multiply in the fall and may reach severe infestation levels throughout the winter and early spring.

When weather conditions are favorable, lice that survived the summer mate and attach their eggs to the animal's hair. After hatching, the young lice feed, mate and lay eggs for the next generation. Several generations may occur during the winter. Transmission from one host to another is usually accomplished when two hosts come in contact.

Damage

Heavy infestations of cattle lice retard the growth of young animals, prevent mature animals from making maximum weight gains, and reduce milk production of dairy cows.

Control

When lice are a problem, treat all cattle including young stock, dry stock, steers, bulls, as well as the milkers. Make two treatments 10 to 14 days apart. Inspect cattle periodically for a return of the infestation. Do not repeat in less than 7 days.

FORAGE CROP INSECTS

Alfalfa Weevil (Hypera postica)

Description

The adult alfalfa weevil is about ¼ inch long, brown or nearly black in color with a distinct dark line along the back. The full grown larvae are dark green in color with a white line extending down the back.

Life Cycle

The adult weevils over winter under trash and in other sheltered places. They are active in the field in late April and May, laying eggs in alfalfa stems. The larvae feed and grow for about four weeks. When mature they drop to the ground and pupate. There is one generation per year.

Damage

The plants which are attacked show a skeletonizing or shredding of the tips of the new growth. This injury increases from early spring until shortly before the time of the first cutting. In heavily infested fields, the growing tips are eaten off, the growth of the plants are stunted, and the green part of the leaves are eaten out.

Control

Treat only if necessary. Whenever possible, harvest the first crop early, thus avoiding the need for application to the first cutting.

Cut Worms

Description

Cutworms are stout, soft bodied caterpillars which grow to a length of 1 ¼ inches. They are dull gray, brown or black in color and may be striped or spotted. They curl up tightly when disturbed. The adults are dull gray or brownish yellow moths.

Life Cycle

Most cutworms pass the winter as larvae, hidden in soil, under trash, or in clumps of grass. They resume feeding in the spring and grow until early summer. The mature larvae pupate beneath the soil surface and later emerge as moths. The females then lay eggs for another generation.

Damage

Cutworms cause severe damage by cutting off new corn plants at or below ground level. Some cutworms feed on leaves, buds or fruits, and others feed on the underground portions of plants.

Control

Treatment should begin 2 or 3 days before the plants are set or before seedlings emerge or when damage occurs.

Armyworm (Pseudaletia unipuncta)

Description

Mature larvae are greenish and have black stripes along each side and down the center of the back. They are about 1 ½ inches long.

The adults are brownish-gray; their wings measure about 1 ½ inches across when expanded.

Life Cycle

Partially grown larvae pass the winter in the soil. They feed early in the spring, reaching maturity in early May. Pupation takes place just below the surface of the soil. In about two weeks the adults emerge, mate and lay eggs. There are three generations each year.

Damage

Crop damage is caused by the larvae. They start feeding on vegetation early in the spring, eating leaves and immature seeds, often devouring plants down to the ground.

Control

Treatment should begin when worms appear or when damage and worms are noticed. The caterpillars may first appear in grains, grasses or weeds adjacent to corn. Watch for armyworm outbreaks following cool, retarded springs.

NUISANCE FLIES

The house fly (Musca domestica) is probably the number one pest of man and his animals. It is not only a nuisance, but also a very effective transmitter of human and animal disease. Most house flies breed in animal manure; they may also breed in garbage, sewage and the carcasses of dead animals. The adult is a warm weather fly and is most active at temperatures above 70 degrees F. Every house fly passes through an egg, larval (maggot) and pupal stage before emerging as the familiar winged form.

The face fly (Musca autumnalis) closely resembles the house fly. It congregates in clusters on the faces of cattle and feeds on the secretions of the mucous membranes around the eyes and muzzle without piercing the skin. These insects cause extreme annoyance to cattle, affecting milk and butterfat production. The larvae breed in cow manure and other excrement.

Sanitation is an important part of fly control. This means prevention of fly breeding. If possible do not allow manure and old hay or bedding to pile up. Spread manure in fields every day.

BITING FLIES

The stable fly (Stomoxys calcitrans) is the most painful bloodsucking fly that feeds on domestic animals. It is a vicious biter and draws blood quickly. The stable fly breeds in wet and decaying vegetable matter especially in straw. Injury is brought about in various ways; for example, continuous attacks by these flies cause fighting and restlessness among the cattle, affecting weight gains.

Control

Control measures are best aimed at the larval stage. Larval numbers may be reduced by spreading manure and organic material every day.

WEEDS

What is a weed?

A weed by the simplest definition is a plant growing where it is not wanted. Therefore, rye growing in a wheat field is a weed; so is a petunia in a cornfield.

Weed Plant Classification

The plant's length of life, the time of year that it grows, and its methods of reproduction largely determine the methods needed for control. In temperate climates there are three principal groups: annuals, biennials and perennials.

An annual plant completes its life cycle from seed in less than one year. A biennial plant lives for more than one year but not over two years. Only a few troublesome weeds fall into this group. Perennials live for more than two years and may live almost indefinitely. Most reproduce by seed and many are able to spread vegetatively.

Critical Stages of Growth for Effective Herbicide Application

Annuals are the easiest and perennials the most difficult weeds to eliminate. All plants are the most vulnerable while in the seedling stage, right after germination, and before they become established plants.

Perennial species that are in the seedling stage are as readily eliminated as annuals or biennials in the same stage. Less herbicide is required to kill perennials when they are treated in the seedling stage. Once perennials become established, they can be difficult to destroy no matter what management practice is used. Herbaceous perennials, like nut sedge or quack grass, have growing points such as rhizomes or tubers below the soil surface. A contact herbicide will completely destroy the above ground leaves but leave the protected buds below ground undamaged to grow back again.

In planning a weed control program with herbicides, economy is important. The lowest effective rate of an herbicide should be used, and the application should be made at the most susceptible stage in the life of the weeds. Thus, the knowledge of whether the weed species are annuals, biennials or perennials becomes important.

Annual Broadleaf Weeds

Lambs quarters

Lambs quarters is an annual broadleaf weed that reproduces by seeds. It is common throughout the United States and can be found in cultivated fields, gardens and waste places.

Full grown plants are three to four feet tall, sometimes much taller, and grow from a short much-branched tap root. Leaves are alternate, ovate in shape, and their edges

are toothed. The flowers are small, greenish in color and crowded in the axils and at the tips of the stems and branches.

In addition to chemical methods, lambs quarters may easily be controlled by hoeing, pulling, mowing or cultivation, provided no single plant is permitted to mature its seed.

Ragweed

Ragweed is a native annual of America which reproduces by seeds. It flowers from July to September and the seeds mature from August to November. It can be found in cultivated fields, rundown pastures and waste places.

The plants are usually 2 ½ feet high when mature, bushy branched above with a fibrous root system. The leaves are deeply cut into several toothed portions.

Good clean cultivation will help control this weed; mowing infested areas before bloom stage will keep the ragweed from seeding.

Pigweed

The pigweeds are all annuals reproducing by seeds. They are natives of American flowering from June to October.

There are many species of pigweeds, but probably the most common one is known as red-root pigweed. The stem, up to six feet tall, arises from a shallow red taproot. The seeds are extremely viable, capable of living for a long time in the soil.

Herbicides can be used fairly effectively before the weed blooms.

Annual Grasses

Crabgrass

Large and small crabgrass are among the most familiar of the warm season weeds. Both species have been introduced from Europe. Large crabgrass is found throughout the United States while small crabgrass is found principally in the more northerly areas.

Crabgrass is an annual reproducing by stems rooting at the nodes and by seeds. The plant is tufted, with the stems mostly prostrate and freely branched. It is commonly found in intertilled crops, the new seedlings of forage crops and in turf grass. In the northeast crabgrass has increased in prevalence due to poor control obtained in cornfields sprayed with atrazine. Since most other annual weed species are controlled, crabgrass is moving into the gap created.

Foxtails

While some foxtail species are important agronomic plants, several are weeds. Yellow foxtail and green foxtail are common weeds of newly seeded areas in the humid eastern United States. Both species have been introduced from Europe and reproduce by seeds.

The foxtails can be controlled by the prevention of seed formation and also by cultivation, clipping and crop rotation. The summer annual species are common associates of both cultivated and forage crops.

The foxtail plant is erect, 8 inches to 2 feet tall, simple or with branches. The flower cluster of yellow foxtail is yellowish and shaped like a narrow bottle brush. In green foxtail, the flower cluster is greenish or purplish generally tapering toward the top but somewhat broader than yellow foxtail.

Field Bindweed

Field bindweed is a perennial that reproduces by seeds and rootstocks. It flowers from June through the summer and produces seed from August until frost.

The roots are very extensive, sometimes growing down as far as 20 or 30 feet. If the plants are cut off during the summer near the surface, new shoots may appear in two or three days.

Rotation of crops, early spring and late fall plowing, as well as thorough cultivation, are good methods of control. Complete coverage and repeated applications of chemicals have resulted in good control, when applied under favorable conditions.

Barnyard grass

Barnyard grass, also commonly known as water grass, is a serious weed in many agricultural areas of the northeast. This weed is spreading rapidly to uninfested fields. Fields where it is already present are becoming much more heavily infested with seed.

Growers consider barnyard grass a severe competitor with row crops. It usually emerges before or with the crop, and during the first several weeks usually rapidly outgrows crop plants. This makes control in crop rows practically impossible without hand-hoeing. Heavy infestations of barnyard grass not only reduce crop yields, they also make mechanical harvesting much more difficult.

Perennial Grasses

Quack grass

Quack grass is a perennial that reproduces by seeds and underground rootstocks. It competes severely with forage crops because of its ability to grow in cool fall and spring weather.

The chief distinguishing characteristic of this plant is the pale yellow, smooth jointed rootstocks which are about 1/8 inch in diameter and run along just beneath the surface of the ground. The rootstock of this plant is actually an underground stem.

Quack grass grows in any kind of soil. In a good rich soil it will not produce many seeds but will propagate by its rootstocks. On poor or dry soils it will produce a good seed crop.

To control quack grass the creeping rootstocks must be killed, and to do this the growth of leaves must be prevented.

Hard to Kill Perennials

Nut grass (Nut sedge)

Northern nut grass, also known as nut sedge or yellow nut grass, is a serious weed in the northeast. During recent years, this weed has become widespread on good agricultural land.

Nut grass is a grass-like perennial that reproduces by seeds and tuber bearing rootstocks. It is a serious pest in many crops, but particularly in potatoes, corn, beans, tomatoes and nurseries. Nut grass not only reduces yields and increases production costs due to increased cultivation and hand-hoeing, but also lowers crop quality and increases harvesting and processing costs.

Control can be achieved by frequent cultivation for one season. If poor drainage persists, it will return again. Nut grass can also be controlled by some chemicals.

Horse Nettle

Horse nettle is a persistent perennial weed having a very extensive and deeply penetrating root system which permits storage of large food reserves. It is normally disseminated by means of seeds, creeping roots and root cuttings.

Some species produce edible fruits whereas others are poisonous. Horse nettle berries have been reported as being poisonous. When present in forage, they have caused losses among horses and cattle.

Horse nettle appears to thrive best on sandy or gravelly soils. However, it will grow in any type of soil. The plant is most frequently noticed in corn, pastures, alfalfa, potatoes, and tomatoes. The most extensive infestations occur in fields in which corn has grown for several years. Because of its extensive root system, this weed is quite resistant to most control attempts. Generally, herbicides only provide control of the current season's top growth.

HERBICIDES

Herbicides are grouped, on the basis of use, into selectives and non-selectives and on the basis of mode of action, into contact, translocated, and sterilant chemicals.

Selective and Non-selective Herbicides

Selective herbicides are those that kill certain weeds without seriously injuring the desirable plants among which they are growing. The reasons for selectivity in some combinations of weeds and desirable plants are known; in other situations they are unknown.

Non-selective herbicides kill vegetation with little discrimination. However, certain species of plants may be physiologically resistant to the chemical or may escape through a particular growth habit. Some examples are perennials that have part of their root system below treated layers of soil; other examples are annuals and shallow rooted perennials that reinfest an area after the chemical has leached below the surface layer.

Contact, Translocated, and Soil Sterilant Chemicals

Contact herbicides kill the tissues that are wetted with the spray. Whether the plant dies or recovers depends on whether it has a protected growing point. Perennials usually have underground buds that will regrow.

Translocated chemicals are absorbed by the leaves and stems or by the roots and move through the vascular system to leaves, buds and root tips. When absorbed by the leaves and stems, the chemical is commonly moved with the food materials that were manufactured in the leaves and stems. When absorbed by the roots, it moves in the water-conducting tissue. The growth regulator type of translocated herbicide is a synthetic compound that behaves like a plant hormone. It accumulates mostly in areas of rapidly dividing cells, upsetting the normal metabolism of the plant and causing death of the cells.

A soil-sterilant herbicide makes soil incapable of supporting higher life, but it does not necessarily kill all life in the soil, such as fungi, bacteria, and other microorganisms. Its toxic effects may remain for only a short time or for years.

Properties of Herbicides

The properties of herbicides and the mode of action of herbicides are factors of fundamental importance to be considered in how to use the chemical most effectively. These properties determine how effective the chemical will be under varying conditions.

Adsorption

One of the most important interactions of the chemical with the environment is the tie-up of the chemical by the soil. This tie-up or adsorption, by various parts of the soil, determines how much of the chemical will be available for action in the soil, how readily the chemical will leach, and how fast the chemical will disappear form the soil.

Leaching

The movement of the herbicide in the soil is a factor that has to be considered in determining the maximum effectiveness of an herbicide. This movement is related to the adsorption of the chemical and also to the amount and intensity of water movement. The leaching is related to the type of soil. Leaching decreases as one goes from sand, to loam, to clay, to high organic matter soil.

Decomposition and Metabolism

Animals and microorganisms of the soil all possess the capacity to detoxify or bring about the decomposition of most organic herbicides. Such breakdown is possible through the various biochemical mechanisms available to them. The more favorable soil conditions are for the growth of soil organisms, the more quickly organic herbicides are decomposed.

Many herbicides are also broken down through a process of chemical degradation.

Volatility

Volatility refers to the vaporization of a compound. Plant damage can be caused by the volatilization of certain herbicides. This is due to the vapors that are released by the herbicides. The volatilization of a chemical may reduce the concentration of a chemical on the treated site, thereby making it less effective or almost non-effective. Some herbicides that are applied to the soil are sufficiently volatile that their effectiveness would be largely lost if not incorporated into the soil shortly after application. The higher the temperature the more likely a substance is to volatilize.

Drift

Drift refers to the movement of spray droplets or vapor from one area to another. Drift is associated with the size of spray droplets, wind speed and height of sprayer above ground level. Drift problems can be avoided if certain precautions are followed:

1. Do not spray when there is a wind.

2. Use low pressure with a large nozzle which will tend to give a coarse spray droplet

3. Application at slow speeds reduces drift from turbulence.

Safety in Using Herbicides

Any chemical is toxic to humans or other animals at a sufficiently high level of exposure. Concentrations of a chemical and duration of exposure are important interacting factors. Some herbicides are fairly safe, but others are very toxic. All safety measures should be considered when using any herbicide.

Specific allowable herbicide residues are established by the US EPA for food, feed and livestock products. These residue tolerances are premised on the protection of human welfare. Registered herbicides and recommended application rates should be strictly observed to avoid the possibility of excessive residues.

Worker Protection Standard

Below is a *brief summary* of the Worker Protection Standard (WPS). The WPS is a federal regulation that is aimed at reducing the risk of pesticide exposures for employees of agricultural operations. Pesticide labels for all products that are used in agricultural production now refer to the WPS and, therefore, compliance with the entire regulation is required. Agricultural business owners and managers should familiarize themselves with these requirements by reading the "How To Comply Manual" or by going to EPA's website (http://www.epa.gov/oppfead1/safety. You may also direct any questions that you may have to the State of Connecticut, DEP, Pesticide Management Program by calling 860/424-3369.

Under the Federal Insecticide Fungicide and Rodenticide Act (FIFRA) it is unlawful for any person to use a pesticide in a manner inconsistent with its labeling. When the WPS is referenced on a pesticide label, users must comply with all of its requirements or be subject to enforcement action, which may include monetary penalties.

Basic Principles of the Worker Protection Standard

EPA's Worker Protection Standard (WPS) is intended to reduce the risk of pesticide poisonings and injuries among persons who are employed at farms, forests, nurseries or greenhouses. The WPS contains requirements for pesticide safety training, notification of pesticide applications, use of personal protective equipment, restricted entry intervals following pesticide application, decontamination supplies, and emergency medical assistance.

The WPS identifies almost all agricultural employees as agricultural workers, early-entry workers or pesticide handlers depending upon the duties they perform. They are distinguished as follows;

Agricultural Workers are those who perform hand labor tasks related to the planting, cultivation and harvesting of plants on farms or in greenhouses, nurseries, or forests. Workers include anyone employed for any type of compensation (including self-employed) doing tasks, such as carrying nursery stock, repotting plants, or planting, weeding, hoeing or watering, related to the production of agricultural plants on an agricultural establishment.

Workers do NOT include employees such as office employees, truck drivers, mechanics, and any other workers not engaged in worker/handler activities.

Early-Entry Workers are workers that, under limited circumstances, may be asked to enter a pesticide treated area before the expiration of the restricted entry interval to perform limited tasks. Employers must provide special protections to early entry

workers such as additional training and instructions, decontamination sites and label specific personal protective equipment.

Pesticide Handlers are those who mix, load, assist with or apply agricultural pesticides; clean, maintain or repair equipment that is used pesticide applications; or perform other tasks that may bring them into direct contact with pesticides.

The WPS does not apply when pesticides are applied on an agricultural establishment in the following circumstances:

- For mosquito abatement, Mediterranean fruit fly eradication, or similar wide-area public pest control programs sponsored by governmental entities. The WPS does apply to cooperative programs in which the growers themselves make or arrange for pesticide applications.
- On livestock or other animals, or in or about animal premises.
- On plants grown for other than commercial or research purposes, such as home fruit and vegetable gardens, and home greenhouses.
- On plants that are in ornamental gardens, parks, and public or private lawns and grounds that are intended only for aesthetic purposes or climatic modification.
- By injection directly into agricultural plants. Direct injection does not include "hack and squirt," "frill and spray," chemigation, soil-incorporation, or soil-injection.
- In a manner not directly related to the production of agricultural plants, such as structural pest control, control of vegetation along rights-of-way and in other noncrop areas, and pasture and rangeland use.
- For control of vertebrate pests.
- As attractants or repellents in traps.
- On the harvested portions of agricultural plants or on harvested timber.
- For research uses of unregistered pesticides.

Summary of WPS Requirements

Protection During Applications

Pesticide handlers (applicators) are prohibited from applying a pesticide in a way that will expose workers or other persons. Workers are not allowed to enter areas where pesticides are being applied. In some circumstances, workers must remain outside of prescribed buffer zones that may be from 25 to 100 feet, depending upon where a pesticide is applied and the method of application, until the application has been completed.

Restricted-entry Intervals (REI)

Restricted-entry intervals are specified on all agricultural plant pesticide product labels. Usually REI's are 12, 24 or 72 hours, although some low toxicity products may have a zero hour REI. Workers are excluded from entering a pesticide treated area during the restricted entry interval.

Personal Protective Equipment
Personal protective equipment (PPE) that is specified on the pesticide label must be provided and maintained for handlers and early-entry workers. PPE must be inspected and cleaned prior to each use.

Notification of Workers
Workers must be notified about treated areas either orally, by posting of signs or both, as indicated on the pesticide label, in order to avoid inadvertent exposures. Workers that are on the premises at the start of the applications must be orally warned before the application takes place. Workers that are not on the premises at the start of the application must be orally warned at the beginning of their first work period if (1) the application is still taking place or (2) if the REI for the pesticide is still in effect.

Pesticide Safety Training
Specific training is required for all workers, early-entry workers and handlers and must be conducted in a language that they understand. Generally, certified private applicators, commercial supervisors or persons that have attended a state approved train the trainer session can train workers and handlers. Those that have been trained as "handlers" can also train workers. EPA has developed WPS training materials for workers and handlers that are available as booklets, flip charts and videotapes, some of which is available in languages other than English. The training must contain at least the concepts as described in the "How To Comply Manual - Criteria for Worker and Handler Training".

Central Posting

Agricultural employers must post specific information at a central location that is accessible to their employees. The information that is required to be posted is as follows:

- **Application list**, which must include the location and description of the area to be treated, the product name, EPA registration number, and active ingredients of the pesticide, the time and date the pesticide is scheduled to be applied and the REI.
- **Emergency information**, which must include the name, telephone number and address of the nearest emergency medical facility.
- A **pesticide safety poster**, which must be either the WPS safety poster developed by EPA or an equivalent poster as described in the "How To Comply Manual - Criteria for Pesticide Safety Poster"

Access to Labeling and Site-Specific Information
Handlers and workers must be informed of required pesticide label information. Central posting of recent pesticide applications is required.

Decontamination Supplies
Handlers and workers must have an ample supply of water, soap and towels for routine washing and emergency decontamination, and a change of clothes as specified in the regulation and the How to Comply Manual.

Emergency Assistance
Transportation must be made available to a medical care facility if there is a reason to believe that a worker or handler may have been poisoned or injured by a pesticide used on the agricultural establishment. Information must be provided to medical personnel about the pesticide to which the person may have been exposed.

Revisions of the Worker Protection Standard

The Environmental Protection Agency made several revisions to the WPS in April 1995. The revisions that are pertinent to Connecticut applicators are summarized below.

I. Training Requirements

As of January 1, 1996, employers must provide brief pesticide safety training to untrained agricultural workers before they enter pesticide treated areas. Employers must be able to verify compliance with this requirement. The brief pesticide safety training must consist of those components highlighted on the WPS safety poster and a statement to workers that complete Pesticide Safety Training will be provided before the end of the 6th day of entering a treated area. This differs from the original 1992 WPS, which allowed a 15-day grace period for complete WPS worker training until October 1997.

The basic pesticide safety information must include the following concepts:

- Pesticide may be on or in plants, soil, irrigation water, or drifting from nearby applications.
- Prevent pesticides from entering your body by:

*Following directions and/or signs about keeping out of treated or restricted areas
*Washing before eating, drinking, using chewing gum or tobacco, or using the toilet
*Wearing work clothing that protects the body from pesticide residues
*Washing/showering with soap and water, shampoo hair and put on clean clothes after work
*Washing work clothes separately from other clothes before wearing them again
*Washing immediately in the nearest clean water if pesticides are spilled or sprayed on the body and, as soon as possible, showering, shampooing, and changing into clean clothes.

- Further training will be provided before the 6th day that a worker enters any area on the agricultural establishment where within the last 30 days, a pesticide has been applied or a REI has been in effect.

To clarify: before working in an area treated with pesticides, an agricultural worker must receive basic pesticide training. Prior to day 6, he must receive complete worker training as described in the "How To Comply Manual." The complete training information is included in EPA's manual entitled, "Protect Yourself from Pesticides-A Guide for Agricultural Workers", or various EPA approved videotapes. Once a worker receives complete WPS training, he will not be required to be retrained for a period of 5 years.

Nothing in this exception changes the WPS training requirements for agricultural pesticide handlers.

II. Exception for Limited Contact Tasks/Early Entry Workers

Agricultural pesticide labels specify a restricted entry level (REI), usually ranging from 12 to 72 hours. The WPS had limited early entry worker activity in treated areas under an REI to 1 hour in a 24-hour period. EPA granted an exception to the WPS that would allow, under specified conditions, workers to enter pesticide treated areas during an REI to perform limited contact tasks that could not be foreseen and which, if delayed until the expiration of the REI, would cause significant economic loss. Some examples of limited contact tasks that qualify for the exception include: the operation and repair of weather monitoring and frost protection equipment; the repair of greenhouse heating, air conditioning and ventilation equipment; the repair of non-application field equipment; the maintenance and moving of beehives. Some examples of hand labor activities and other tasks which would not qualify for this exception include: harvesting; thinning; weeding; topping; planting; sucker removal; packing produce into containers in the field; operating, moving or repairing irrigation equipment; and performing the task of a crop advisor.

This exception increases the time workers will be able to remain in treated areas under an REI for early entry activities from 1 hour to 8 hours within a 24-hour period *providing the following conditions are met*:

1) The worker's contact with treated surfaces is minimal and is limited to the feet, lower legs, hands and forearms.

2) The pesticide product does not have a statement in the labeling requiring workers to be notified both orally and by posting;

3) Personal protective equipment for early entry is provided to the worker and must either conform with the label requirements or include at least coveralls, chemical resistant gloves, shoes plus socks, chemical resistant footwear, and protective eyewear (if protective eyewear is required for handlers by the product labeling);

4) No hand labor such as hoeing, picking, pruning, etc. is performed;

5) The workers do not enter the treated area during the first 4 hours, and until applicable ventilation criteria have been met, and until any label specific inhalation exposure level has been reached;

6) Before early entry workers enter a treated area under an REI, the agricultural employer shall give them oral or written notification of the specifics of the exception to early entry as indicated on the pesticide label in a language the workers understand.

NOTE: Since this exception allows tasks to be performed during the REI, all persons engaged in the tasks under this exception must be trained as early entry workers as described in the How To Comply Manual or as a Handler prior to performing the tasks, in accordance with WPS.

III. Exception for Irrigation Tasks

EPA completed an exception to the WPS that allows early entry workers under specified conditions, to enter pesticide treated areas during a REI to perform irrigation tasks related to operating, moving or repairing irrigation or watering equipment. This exception extends the time that a trained early entry worker may remain in a pesticide treated area to perform irrigation tasks from one hour to 8 hours within a 24 hour period.

The terms of this exception further require that the need for the task could not have been foreseen and cannot be delayed until after the expiration of the REI. A task that cannot be delayed is one that, if not performed before the REI expires, would cause significant economic loss, and there are no alternative practices, which would prevent significant loss. (Discussions are currently underway with EPA to address watering needs in the greenhouse setting. At present, **this exception does not apply to routine watering needs in a greenhouse** since the need is not viewed as one that could not have been foreseen)

In addition to the above criteria, the terms of the exception for irrigation activities requires compliance with items 1 through 6 listed above for the limited contact exception.

IV. Reduced Restricted Entry Intervals for Low Risk Pesticides

The WPS established an interim minimum REI of 12 hours for all end use pesticide products for agricultural uses. However, EPA had been asked to consider reducing the minimum 12-hour REI for certain lower toxicity products. EPA determined that the reduction of the REI for specific low risk pesticides can be accomplished without jeopardizing worker safety and would also promote the use of less toxic products over those with greater risks and longer REI's. Therefore, EPA established a regulation to reduce the REI on 114 lower toxicity products to 4 hours or, in some cases, zero hours. EPA has instructed registrants to revise the labels of affected products to meet certain criteria. Pesticide users should examine labels closely for stickers or other indications of a reduced REI in accordance with this regulation.

The affected lower risk pesticides generally consist of microbial pesticides, biochemical pesticides and certain conventional agricultural pesticides.

V. Warning Signs

EPA amended the WPS to modify the warning sign size and language requirement. The amendment allows the substitution of the language commonly spoken and read by workers for the Spanish portion of the warning sign. The sign must be in the same format required by WPS and it must be visible and legible. Use of alternative languages is optional and the use of Spanish/English is always acceptable.

The amendment also allows the use of smaller signs provided that the minimum letter size and posting distance requirements are observed. In nurseries and greenhouses, smaller signs may be used at any time. A small sign may be used on a forest or farm if the treated area is too small to accommodate the standard sign.

For more information on the scope of the WPS, consult the How to Comply Manual or on the Internet at www.epa.gov/pesticides/safety.

11/5/2004