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related activities included in category 8 below.

(6) *Right-of-way pest control.* This category includes commercial applicators using or supervising the use of restricted use pesticides in the maintenance of public roads, electric powerlines, pipelines, railway rights-of-way or other similar areas.

(7) *Industrial, institutional, structural and health related pest control.* This category includes commercial applicators using or supervising the use of restricted use pesticides in, on, or around food handling establishments, human dwellings, institutions, such as schools and hospitals, industrial establishments, including warehouses and grain elevators, and any other structures and adjacent areas, public or private; and for the protection of stored, processed, or manufactured products.

(8) *Public health pest control.* This category includes State, Federal or other governmental employees using or supervising the use of restricted use pesticides in public health programs for the management and control of pests having medical and public health importance.

(9) *Regulatory pest control.* This category includes State, Federal or other governmental employees who use or supervise the use of restricted use pesticides in the control of regulated pests.

(10) *Demonstration and research pest control.* This category includes: (i) individuals who demonstrate to the public the proper use and techniques of application of restricted use pesticides or supervise such demonstration, and (ii) persons conducting field research with pesticides, and in doing so, use or supervise the use of restricted use pesticides. Included in the first group are such persons as extension specialists and county agents, commercial representatives demonstrating pesticide products, and those individuals demonstrating methods used in public programs. The second group includes: State, Federal, commercial and other persons conducting field research on or utilizing restricted use pesticides.

(c) *Other categories and subcategories.* Any State submitting a plan pursuant to this section for the certification of applicators, as provided for below, may

designate such subcategories within the above 10 categories as it deems necessary. In addition, a State may delete a category not needed or may request the Administrator's approval of additional major categories.

§ 171.4 Standards for certification of commercial applicators.

(a) *Determination of competency.* Competence in the use and handling of pesticides shall be determined on the basis of written examinations, and, as appropriate, performance testing, based upon standards set forth below and which are approved by the Administrator. Such examination and testing shall include the general standards applicable to all categories (§ 171.4(b)) and the additional standards specifically identified for each category or subcategory (if any) in which an applicator is to be classified (§ 171.4(c)). State standards must conform and be at least equal to those prescribed herein. In developing the details of standards at the State level and in structuring examinations, it is important to recognize and reflect the extent of competency appropriate and necessary to a particular category.

(b) *General standards for all categories of certified commercial applicators.* (1) All commercial applicators shall demonstrate practical knowledge of the principles and practices of pest control and safe use of pesticides. Testing shall be based on examples of problems and situations appropriate to the particular category or subcategory of the applicator's certification and the following areas of competency:

(i) *Label & labeling comprehension.* (a) The general format and terminology of pesticide labels and labeling;

(b) The understanding of instructions, warnings, terms, symbols, and other information commonly appearing on pesticide labels;

(c) Classification of the product, general or restricted; and

(d) Necessity for use consistent with the label.

(ii) *Safety.* Factors including:

(a) Pesticide toxicity and hazard to man and common exposure routes;

(b) Common types and causes of pesticide accidents;

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(c) Precautions necessary to guard against injury to applicators and other individuals in or near treated areas;

(d) Need for and use of protective clothing and equipment;

(e) Symptoms of pesticide poisoning;

(f) First aid and other procedures to be followed in case of a pesticide accident; and

(g) Proper identification, storage, transport, handling, mixing procedures and disposal methods for pesticides and used pesticide containers, including precautions to be taken to prevent children from having access to pesticides and pesticide containers.

(iii) *Environment.* The potential environmental consequences of the use and misuse of pesticides as may be influenced by such factors as:

(a) Weather and other climatic conditions;

(b) Types of terrain, soil or other substrate;

(c) Presence of fish, wildlife and other non-target organisms; and

(d) Drainage patterns.

(iv) *Pests.* Factors such as: (a) Common features of pest organisms and characteristics of damage needed for pest recognition;

(b) Recognition of relevant pests; and

(c) Pest development and biology as it may be relevant to problem identification and control.

(v) *Pesticides.* Factors such as:

(a) Types of pesticides;

(b) Types of formulations;

(c) Compatibility, synergism, persistence and animal and plant toxicity of the formulations;

(d) Hazards and residues associated with use;

(e) Factors which influence effectiveness or lead to such problems as resistance to pesticides; and

(f) Dilution procedures.

(vi) *Equipment.* Factors including: (a) Types of equipment and advantages and limitations of each type; and

(b) Uses, maintenance and calibration.

(vii) *Application techniques.* Factors including:

(a) Methods of procedure used to apply various formulations of pesticides, solutions, and gases, together with a knowledge of which technique of application to use in a given situation;

(b) Relationship of discharge and placement of pesticides to proper use, unnecessary use, and misuse; and

(c) Prevention of drift and pesticide loss into the environment.

(viii) *Laws and regulations.* Applicable State and Federal laws and regulations.

(c) *Specific standards of competency for each category of commercial applicators.*

Some of the factors referenced in paragraph (b) of this section are of particular importance because of the different types of activities carried out by applicators in each category. Such factors must be especially stressed and specifically reflected in State certification standards, as appropriate. For example, practical knowledge of drift problems should be required of agricultural applicators but not of seed treatment applicators. The latter, however, should be particularly knowledgeable of the hazards of the misuse of treated seed and the necessary precautionary techniques. Many applicators in § 171.3(b) (8), (9), and (10) will have had considerable formal education, training and experience in preparation for their positions. Their competency with respect to the use and handling of pesticides will have been determined by examining boards of their professional scientific societies utilizing standards which equal or exceed those prescribed herein. Such standards should be consulted by States in developing their State standards for certification of such applicators under these regulations. Commercial applicators in each category shall be particularly qualified with respect to the practical knowledge standards elaborated below:

(1) *Agricultural pest control—(i) Plant.* Applicators must demonstrate practical knowledge of crops grown and the specific pests of those crops on which they may be using restricted use pesticides. The importance of such competency is amplified by the extensive areas involved, the quantities of pesticides needed, and the ultimate use of many commodities as food and feed. Practical knowledge is required concerning soil and water problems, pre-harvest intervals, re-entry intervals, phytotoxicity, and potential for environmental contamination, non-target

injury and community problems resulting from the use of restricted use pesticides in agricultural areas.

(ii) *Animal*. Applicators applying pesticides directly to animals must demonstrate practical knowledge of such animals and their associated pests. A practical knowledge is also required concerning specific pesticide toxicity and residue potential, since host animals will frequently be used for food. Further, the applicator must know the relative hazards associated with such factors as formulation, application techniques, age of animals, stress and extent of treatment.

(2) *Forest pest control*. Applicators shall demonstrate practical knowledge of types of forests, forest nurseries, and seed production in their State and the pests involved. They should possess practical knowledge of the cyclic occurrence of certain pests and specific population dynamics as a basis for programming pesticide applications. A practical knowledge is required of the relative biotic agents and their vulnerability to the pesticides to be applied. Because forest stands may be large and frequently include natural aquatic habitats and harbor wildlife, the consequences of pesticide use may be difficult to assess. The applicator must therefore demonstrate practical knowledge of control methods which will minimize the possibility of secondary problems such as unintended effects on wildlife. Proper use of specialized equipment must be demonstrated, especially as it may relate to meteorological factors and adjacent land use.

(3) *Ornamental and turf pest control*. Applicators shall demonstrate practical knowledge of pesticide problems associated with the production and maintenance of ornamental trees, shrubs, plantings, and turf, including cognizance of potential phytotoxicity due to a wide variety of plant material, drift, and persistence beyond the intended period of pest control. Because of the frequent proximity of human habitations to application activities, applicators in this category must demonstrate practical knowledge of application methods which will minimize or prevent hazards to humans, pets, and other domestic animals.

(4) *Seed-treatment*. Applicators shall demonstrate practical knowledge of types of seeds that require chemical protection against pests and factors such as seed coloration, carriers, and surface active agents which influence pesticide binding and may affect germination. They must demonstrate practical knowledge of hazards associated with handling, sorting and mixing, and misuse of treated seed such as introduction of treated seed into food and feed channels, as well as proper disposal of unused treated seeds.

(5) *Aquatic pest control*. Applicators shall demonstrate practical knowledge of the secondary effects which can be caused by improper application rates, incorrect formulations, and faulty application of restricted use pesticides used in this category. They shall demonstrate practical knowledge of various water use situations and the potential of downstream effects. Further, they must have practical knowledge concerning potential pesticide effects on plants, fish, birds, beneficial insects and other organisms which may be present in aquatic environments. These applicators shall demonstrate practical knowledge of the principles of limited area application.

(6) *Right-of-way pest control*. Applicators shall demonstrate practical knowledge of a wide variety of environments, since rights-of-way can traverse many different terrains, including waterways. They shall demonstrate practical knowledge of problems on runoff, drift, and excessive foliage destruction and ability to recognize target organisms. They shall also demonstrate practical knowledge of the nature of herbicides and the need for containment of these pesticides within the right-of-way area, and the impact of their application activities in the adjacent areas and communities.

(7) *Industrial, institutional, structural and health related pest control*. Applicators must demonstrate a practical knowledge of a wide variety of pests, including their life cycles, types of formulations appropriate for their control, and methods of application that avoid contamination of food, damage and contamination of habitat, and exposure of people and pets. Since human exposure, including babies, children,

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pregnant women, and elderly people, is frequently a potential problem, applicators must demonstrate practical knowledge of the specific factors which may lead to a hazardous condition, including continuous exposure in the various situations encountered in this category. Because health related pest control may involve outdoor applications, applicators must also demonstrate practical knowledge of environmental conditions, particularly related to this activity.

(8) *Public health pest control.* Applicators shall demonstrate practical knowledge of vector-disease transmission as it relates to and influences application programs. A wide variety of pests is involved, and it is essential that they be known and recognized, and appropriate life cycles and habitats be understood as a basis for control strategy. These applicators shall have practical knowledge of a great variety of environments ranging from streams to those conditions found in buildings. They should also have practical knowledge of the importance and employment of such non-chemical control methods as sanitation, waste disposal, and drainage.

(9) *Regulatory pest control.* Applicators shall demonstrate practical knowledge of regulated pests, applicable laws relating to quarantine and other regulation of pests, and the potential impact on the environment of restricted use pesticides used in suppression and eradication programs. They shall demonstrate knowledge of factors influencing introduction, spread, and population dynamics of relevant pests. Their knowledge shall extend beyond that required by their immediate duties, since their services are frequently required in other areas of the country where emergency measures are invoked to control regulated pests and where individual judgments must be made in new situations.

(10) *Demonstration and research pest control.* Persons demonstrating the safe and effective use of pesticides to other applicators and the public will be expected to meet comprehensive standards reflecting a broad spectrum of pesticide uses. Many different pest problems situations will be encountered in the course of activities associated with

demonstration, and practical knowledge of problems, pests, and population levels occurring in each demonstration situation is required. Further, they should demonstrate an understanding of a pesticide-organism interactions and the importance of integrating pesticide use with other control methods. In general, it would be expected that applicators doing demonstration pest control work possess a practical knowledge of all of the standards detailed in §171.4(b). In addition, they shall meet the specific standards required for paragraphs (c) (1) through (7) of this section as may be applicable to their particular activity.

Persons conducting field research or method improvement work with restricted use pesticides should be expected to know the general standards detailed in 171.4(b). In addition, they shall be expected to know the specific standards required for paragraphs (c) (1) through (9) of this section, applicable to their particular activity, or alternatively, to meet the more inclusive requirements listed under "Demonstration."

(d) *Special standards.* This space reserved for possible issuance of Special Standards.

(e) *The above standards do not apply to the following persons for purposes of these regulations.* (1) Persons conducting laboratory type research involving restricted use pesticides; and

(2) Doctors of Medicine and Doctors of Veterinary Medicine applying pesticides as drugs or medication during the course of their normal practice.

§ 171.5 Standards for certification of private applicators.

(a) Competence in the use and handling of pesticides by a private applicator will be determined by procedures set forth below. State standards must conform and be at least equal to those prescribed herein. As a minimum requirement for certification, a private applicator must show that he possesses a practical knowledge of the pest problems and pest control practices associated with his agricultural operations; proper storage, use, handling and disposal of the pesticides and containers; and his related legal responsibility.