

Alaska Regulated Pest Management Manual



Category One

In general, applicators who apply pesticides to property other than their own must obtain certification from the Alaska Department of Environmental Conservation (ADEC) Pesticide Program. Applicators who apply restricted-use pesticides, regardless of location, must also be certified.

Category One, Regulated Pest Management, is intended for state, federal, or other governmental employees who apply pesticides to manage **pests which are regulated by state or federal laws**.

The information needed to successfully complete the written core examination required for all certified pesticide applicators in Alaska includes:

1. National Pesticide Applicator Certification Core Manual;
2. Alaska Core Manual; and
3. State of Alaska Pesticide Regulations in Title 18, Chapter 90 of the Alaska Administrative Code (18 AAC 90)

The information needed to successfully obtain certification in Category One in Alaska includes:

1. This Alaska Manual; and
2. Washington State University Agricultural Weed Management Principals.

Learning Objectives for this Alaska Manual

- Explain why introduced organisms have the potential to become serious pests.
- Describe the five components of a regulatory pest management program.
- Explain some reasons why an organism might be designated as a regulated pest.
- Describe factors that should be considered when selecting a pesticide to control regulated pests.
- Name the Alaska state agencies responsible for control of regulated pests, and describe their authorities.
- List pests that are regulated in Alaska.

CALCULATIONS

Precise and accurate application is important for every pesticide application. However, for this category, only basic math skills are required and will be tested. Although applications to water to control aquatic invasives require more complex calculations, these skills will be evaluated under Category Six, Aquatic Pest Control. To ensure you can pass the calculations portion of the Category One Exam, you will need to carefully review pages 164-165, and 190-192 in the National Core Manual. Additional resources for pesticide applicator math are available online from the Purdue Pesticide Program at <https://ag.purdue.edu/departments/extension/ppp/>.

REGULATED PEST MANAGEMENT

Organisms that are introduced to new areas can become serious pests. Factors such as environmental conditions, diseases, predators, and parasites usually keep the population of an organism at levels where no significant damage occurs. However, these factors may not be present in an area where the pest did not exist in the past.

Regulated pests can include any type of pest that poses a threat to resources. Pests may include weeds, insects, or other animals which may harm agriculture, the environment, wildlife, or cause other negative impacts. Pests may also include viruses, fungus, and other diseases or pathogens which can reduce plant vigor and crop yields.

Regulatory pest management programs use several different strategies, which generally progress through the following sequence:

1. Identification of risk.
2. Prevention of entry.
3. Survey and detection.
4. Eradication.
5. Retardation of spread and mitigation of losses.

Identification of Risk

Identification of risk includes recognition of the potential for an insect, disease, or other pest to cause harm, and evaluation of the probability that the pest may become established in an area. If a pest has the potential to cause significant harm and also has a likelihood of becoming established in an area, then further steps may be warranted.

The Alaska Exotic Plants Information Clearinghouse (AKEPIC) is a collaborative group made up of several state and federal agencies that tracks non-native plants occurring in Alaska, and ranks them based on potential invasiveness and impacts. The Department of Natural Resources and Department of Fish and Game also identify invasive, noxious, or nuisance species. However, as of this manual date, only rats and some invasive aquatic plants are specifically designated as regulated pests in Alaska.

Prevention of Entry

The primary strategy to prevent pests from becoming established in a new area is to exclude pest entry through the use of quarantines. Quarantines may be applied through either state or federal authority.

Survey and Detection

Survey and detection should take place throughout a quarantine period, with the intent of discovering any infestations while they are still small enough to eradicate. Monitoring involves a regular and methodical procedure to quantify any pest presence.

Eradication

If prevention is not successful and a pest becomes established, the sooner eradication efforts are begun, the more likely they will be successful. A control is only beneficial if it results in significant long term reduction in pest populations. The selection of proper methods of control and suitable pesticides must consider many factors, including:

- pest species,
- pest life cycle,
- method of dispersal or spread of pest,
- pest's mode of attack,
- host species,
- size of infestation,
- location of infestation,
- potential effects on vulnerable environments or non-target species.

Retardation and Mitigation

Eradication is often not feasible if populations are not identified and controlled early. In cases where the pest has become established, objectives will be different depending on the pest populations, the damage being caused by the pest, and the likelihood of further spread of the pest. The same methods can be applied to try to slow or prevent the spread of the pest, or to mitigate damage caused by the pest.

FEDERAL REGULATED PEST AUTHORITY

Pests that are widespread or pose significant threats may be regulated nationwide. Federally regulated pests are identified in the U.S Code of Federal Regulations (7 CFR 300-399).

Information about federally regulated pests may be found at the United States Department of Agriculture, Animal and Plant Health Inspection Service (APHIS) website.

<https://www.aphis.usda.gov/plant-imports/regulated-pest-list>

The federal ***Plant Protection Act of 2000*** consolidated several different federal laws into one comprehensive law that provides authority to regulate plants, plant products, and plant pests. This act includes several provisions designed to protect agriculture, the environment, and citizens from the economic and environmental harm caused by pests. Actions can include prohibition or restriction on the movement of a plant or plant product, if necessary to prevent the introduction or spread of a plant pest or noxious weed. It can also include seizure, quarantine, treatment, or destruction of any plant, plant product, or plant pest, to prevent the introduction or spread of a plant pest or noxious weed.

ALASKA STATE REGULATED PEST AUTHORITY

Pests that are of specific concern to Alaska may be regulated at the state level through various agencies.

The Department of Natural Resources, Division of Agriculture has authority under Alaska Statute AS 03.05.010 to regulate distribution and use of plants, plant products, nursery stock, feeds, agricultural chemicals, and other substances to prevent the spread of pests and disease. This includes establishment of state quarantines, as outlined in Title 11, Chapter 34 of the Alaska Administrative Code.

These statutes and regulations allow the Division of Agriculture to:

- Regulate the sale, distribution, use, or entry into Alaska of plants, plant products, nursery stock, feeds, agricultural chemicals, and other substances;
- Establish quarantines for specified or newly identified pests;
- Examine and inspect premises containing products that may carry pests;
- Sample, inspect, or analyze agricultural products; and
- Destroy or treat pests.

The Alaska Department of Fish and Game has authority under AS 16.05.255 to regulate both exotic and native animals. They may also conduct habitat and watershed improvement activities, which could include control of various types of pests or invasive species.

REGULATED PESTS IN ALASKA

There are very few specifically regulated pests in Alaska. Some of the regulated pests that do exist require certification in other categories.

Rats

Rats are a regulated pest in Alaska. However, because of the significance of their threat, and because of the unique pest control methods, there is a separate applicator category for control of this pest. **Applicators wishing to control rodents must be certified in Category Seventeen B, Limited Vertebrate Pest Control-Rodents.**

Aquatic Invasive Plants

In 2014, the Department of Natural Resources issued a quarantine prohibiting importation, sale or transportation of the following invasive aquatic plants in Alaska:

- Elodea (*Elodea canadensis* and *Elodea nuttallii*)
- Eurasian Water Millfoil (*Myriophyllum spicatum*)
- Brazilian Waterweed (*Egeria densa*)
- Hydrilla (*Hydrilla verticillata*)

Elodea has been identified in several Alaskan water bodies, and efforts to eradicate these populations have been undertaken in several locations, including the Anchorage area and the Kenai Peninsula. Because of the complexities and increased potential risk from water

applications, applicators wishing to control aquatic pests must be certified in Category Six, Aquatic Pest Control.

Invasive Weeds

Under 11 AAC 34.020, there are 14 prohibited noxious weeds, and nine restricted weeds as of October 2016. 11 AAC 34.075 prohibits anyone from planting, selling, or transporting any seed or plants that contain any seed of prohibited weeds, or contains any restricted weed seeds in excess of the listed tolerance.

Prohibited weeds	Restricted weeds
1. Bindweed, field (<i>Convolvulus arvensis</i>);	1. Annual bluegrass (<i>Poa annua</i>); 90 seeds per pound
2. Fieldcress, Austrian (<i>Rorippa austriaca</i>);	2. Blue burr (<i>Lappula echinatat</i>); 18 seeds per pound
3. Galensoga (<i>Galensoga parviflora</i>);	3. Mustard (<i>Brassica kaber juncea</i>); 36 seeds per pound
4. Hempnettle (<i>Galeopsis tetrahit</i>);	4. Oats wild (<i>Avena fatua</i>); seven seeds per pound
5. Horsenettle (<i>Solanum carolinense</i>);	5. Plantain buckhorn (<i>Plantago sp.</i>); 90 seeds per pound
6. Knapweed, Russian (<i>Centaurea repens</i>);	6. Radish (<i>Raphanus raphanistrum</i>); 27 seeds per pound
7. Lettuce, blue-flowering (<i>Lactuca puichella</i>);	7. Toadflax yellow (<i>Linaria vulgaris</i>); one seed per pound
8. Orange Hawkweed (<i>Hieracium aurantiacum</i>);	8. Vetch tufted (<i>Vicia cracca</i>); two seeds per pound
9. Purple Loosestrife (<i>Lythrum salicaria</i>);	9. Wild Buckwheat (<i>Polygonum convovulus</i>); two seeds per pound
10. Quackgrass (<i>Agropyron repens</i>);	
11. Sowthistle, perennial (<i>Sonchus arvensis</i>);	
12. Spurge, leafy (<i>Euphorbia esula</i>);	
13. Thistle, Canada (<i>Cirsium arvense</i>);	
14. Whitetops and its varieties (<i>Cardaria drabe</i> , <i>C. pubescens</i> , <i>Lepidium latifolium</i>).	

The Division of Agriculture operates an invasive plant program for the state which lists these regulated weeds, along with pictures; <http://plants.alaska.gov/invasives/noxious-weeds.htm>.

Applicators wishing to work on control of invasive weeds may become certified in this category (Category One, Regulated Pest Management). However, there are several other categories which may also be used for this type of work, including Category Three (Agricultural Pest Control) and Category Nine (Right-of-Way and Industrial Grounds Pest Control).

Insects, Fungus, And Other Regulated Pests

At this time, the State of Alaska has not listed any insects, fungus, or other pests as specifically regulated.

WASHINGTON STATE UNIVERSITY MANUAL

Portions Of The Washington State University Manual To Disregard

You may disregard pages 41-42, of the Washington State University *Agricultural Weed Management Principals Manual*, which includes information about Washington State regulations. These regulations do not apply in Alaska.

Learning Objectives

From the *Agricultural Weed Management Principals Manual*:

Basic Weed Science

- Describe what a weed is.
- Explain why introduced plants can be more problematic in an agricultural area.
- List some ways that seeds spread.
- List the characteristics of weed seeds that make them difficult to eradicate.
- Describe the identifying characteristics of a grass.
- Describe the identifying characteristics of a broadleaf plant.
- Describe the difference between an annual plant and a perennial plant.
- Describe the various ways that perennial plants may spread that do not involve seeds.

Weed Management

- List the most common way that weeds are introduced into croplands.
- Describe some techniques for preventing weeds from becoming established.
- Describe some mechanical methods of controlling weeds.
- Describe some cultural methods of controlling weeds.

Herbicides

- Describe the difference between contact herbicides and systemic herbicides.
- Explain why it is important to get uniform coverage of the entire plant with a contact herbicide.
- Describe some ways that soil applied herbicides can be incorporated into the soil.
- For each of the following modes of action, explain how they work to control weeds, and list some common pesticides with this mode of action: growth regulator, amino acid synthesis inhibitors, lipid inhibitors, seedling growth inhibitors, photosynthesis inhibitors, cell membrane disruptors, and pigment inhibitors.
- Describe the difference between selective and non-selective herbicides.
- Explain how some of the characteristics of plants affect herbicide selectivity.
- Explain how application factors such as application rate, timing, and location affect herbicide selectivity.

- Explain how chemical factors such as formulation and use of adjuvants can affect herbicide selectivity.
- Describe several techniques to help prevent the development of herbicide resistance.

Herbicide Performance

- Define and explain the difference between adsorption and absorption.
- Explain why herbicides are least likely to adsorb to sand, and most likely to adsorb to clay.
- Explain why herbicides are more likely to adsorb to soils with high organic content.
- Describe the type of soil which herbicides are most likely to leach through.
- Explain why higher air temperatures can lead to less herbicide selectivity.
- Explain why rainfall can result in poor weed control for both foliar and soil-applied herbicides.
- Explain how humidity can affect herbicide efficacy.
- Explain how wind can affect herbicide efficacy.
- List the four growth stages of a weed.
- Name the growth stage of an annual weed that is most susceptible to control efforts.
- Explain why it is important to know when plant sugars flow from leaves towards the roots in perennial plants.
- Name the growth stages of a perennial weed that are generally most susceptible to herbicides, and explain why.

Precautions

- List seven factors that may impact the amount of spray drift from applying herbicide.
- Define the term ‘vapor drift’.
- Describe how humidity and temperature can impact vapor drift.
- List some factors that can increase the chance of herbicide leaching into groundwater.
- Explain why it is advisable to dedicate application equipment to one type of herbicide.
- List some factors that determine the length of residual activity of a herbicide.
- List some precautions to take when using residual herbicides.
- Define the term ‘photodegradation’.
- Define the term ‘microbial degradation’.
- Define the term ‘chemical degradation’.
- Explain how adsorption, leaching, volatilization, uptake by plants, and soil pH can affect the persistence of herbicides.
- Describe several methods to help reduce levels of residual herbicide in soil.

Herbicide Application

- Name the part of a cut stump that should be treated with herbicide to prevent re-growth, and explain why treating this area is effective.
- Describe each of the following application methods: foliar, basal, frill, cut stump, soil.
- Describe the common types of pesticide application used in agriculture, including the situations where each would be most appropriate, and advantages and disadvantages of each method.

- List the advantages and disadvantages of the following nozzle materials: tungsten carbide, ceramic, stainless steel, brass, nylon, aluminum.
- State when nozzle tips should be replaced.
- Explain how to dispose of rinsate from cleaning application equipment.

Calculations and Calibration

- Calculate irregular shaped areas and perimeters.
- Describe the steps for calibrating a granular spreader.
- List the three variables that determine sprayer delivery rate.
- State the best way to make major changes to sprayer flow rate.
- Describe the steps for calibrating a boom sprayer.
- Explain guidelines for tank mixing different herbicides.
- Explain the purpose of adjuvants, including stickers, spreaders, penetrants, and buffers.
- Calculate effective application rate and swath width of a granular spreader, application rate of a boom sprayer, and other example problems.

Before Using Any Pesticide

STOP

**All pesticides can be harmful to health
and environment if misused.**

**Read the label
carefully. Use only
as directed.**