

Category G: Right-of-Way Pest Control

Right-of-Way Pest Control Learning Objectives

THIS CATEGORY IS AVAILABLE ONLY TO NON-PRIVATE APPLICATORS BY TAKING A SEPARATE CATEGORY EXAM.

After studying this section, you should be able to:

- ✓ Identify distinct right-of-way sites.
- ✓ List the goals of pest control in right-of-way sites.
- ✓ List and explain methods of pest control in rights-of-way.
- ✓ Describe methods to protect land adjacent to rights-of-way.
- ✓ Describe factors to consider when selecting pesticides.

Category G: Right-of-Way Pest Control

Rights-of-way are distinct areas involved in the transport of people, goods and services. These areas include:

- Federal, state and county highways and roads
- Roadside rest areas
- Railroad lines, stations, substations and equipment yards
- Electric utility lines, including transformer stations and substations
- Telephone lines and other communication network infrastructure
- Pipelines, including pumping stations
- Equipment yards
- Bicycle, horse, snowmobile or other public paths or trails that are outside of established public recreational areas

Aquatic sites are not included in this category; aquatic sites are covered by Category F, Aquatic Pest Control.

There are many goals when managing rights-of-way. Safe access is important, as are fire prevention, visibility, erosion control and safety for

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A “noxious weed” is a plant designated by law as requiring control.

Rights-of-way are generally long and narrow and pass-through areas with different soil types, vegetative communities, topographies and sensitive sites.

Roadside right-of-way goals include:

- **Maintaining or improving visibility**
- **Reducing potential fire hazards**
- **Providing clear and safe emergency areas for vehicles**
- **Maintaining or improving aesthetics**

Some portions of the roadside right-of-way should be free of vegetation.

This is generally accomplished using chemical controls.

workers and the general public. Weeds, especially noxious weeds, must be controlled to prevent weed spread to adjacent lands. Aesthetics become an important factor in and around urban areas.

Rights-of-way are generally long and narrow and pass-through areas with different soil types, vegetative communities, topographies and sensitive sites. Many rights-of-way are limited in size or purpose. For example, some road widths are mandated not to exceed a certain size. The differences in use and in physical attributes make a “one-size-fits-all” solution to right-of-way pest control impossible. Pest management will vary from site to site.

Preventing pesticide drift, non-target pesticide exposure, and protecting surface water and groundwater can be challenging during rights-of-way pesticide applications due to the linear nature of many rights-of-way and varied adjacent land uses. Careful planning is required prior to a pesticide application to consider all these factors. Review the General Knowledge: Guidelines for the Safe Use of Pesticides chapter and the General Knowledge: Pesticide Use and the Environment chapter of this manual for further information.

Right-of-Way Sites

Roadsides: Roadsides are common rights-of-way in Nevada, and include federal, state and county roads and roadsides, intersections, barrow pits (or bar ditches) and medians. Pest control goals along roadsides include maintaining or improving visibility, reducing fire hazards, providing clear and safe emergency areas for vehicles, and maintaining or improving aesthetics.

The amount of vegetation to be maintained varies depending on the specific use and needs of each right-of-way site. Some areas must be vegetation-free, including the roadbed, road shoulders, guardrails, signs, posts and fences. It is difficult and expensive to maintain bare rights-of-way by mowing, so vegetation in these areas is generally eliminated by chemical means.

Other areas may be vegetated with low-growing shrubs or grasses to reduce erosion. These zones generally encompass the portion of the right-of-way not contained within the road shoulder or other areas previously mentioned, and include barrow pits (or bar ditches), road intersections (other than shoulders) and medians. Care must be used in these areas to maintain sufficient vegetation to reduce erosion and provide competition with weeds, while keeping the height of the vegetation low enough that it does not interfere with visibility or safety. Maintaining or controlling vegetation in these areas can also help reduce fire hazard potential.

Some areas, such as medians, may be landscaped. Maintaining these areas may require mechanical, cultural and chemical controls to provide safety, visibility and aesthetics.

Railroads: Railroads are another common type of right-of-way requiring pest control, with the primary focus on vegetation management. Railroads are long paths that traverse public and private lands that are used for multiple purposes, such as rangeland, cropland, pasture, recreation, residential and commercial industry. Weeds, especially noxious weeds, must be controlled to prevent spread to adjacent lands. The goals for railroad right-of-way pest control also include fire prevention, visibility and safety of work crews.

Railroads and rail yards are generally owned by the railroad, so planning for vegetation or other pest management is possible and can be done well in advance. Since railroads own the land, access is generally not a problem and ground application equipment can be used. Because railroad tracks are long, narrow paths, care must be taken to prevent drift. Always consider adjacent land uses when planning railroad weed control programs.

Weed management along railroads commonly relies on chemical methods. Tracks, signals, switches and informational signs generally are kept bare of all vegetation. At crossings, brush control and especially vegetation height reduction is important. Complete removal of vegetation may not be permissible in these areas due to local regulations set by the crossing roadway's jurisdiction. Visibility must be maintained for both rail and vehicular traffic crossing the railroad lines. Railroad yard treatment includes vegetation removal or reduction to maintain visibility and safety and to prevent fires.

Public Utilities: Public utilities are another right-of-way location requiring vegetation control. Public utilities fall into two broad categories: pipelines and electrical transmission lines. The goals of both categories are the same: weed spread prevention, fire protection, maintenance of sites, maintenance of services, and public safety.

Generally, in Nevada, the rights-of-way for both power lines and pipelines are not paved. Access is necessary for maintenance and emergencies, but the areas are often in locations where land use is more rural, such as cropland, pasture or rangeland. The areas may also be used as natural wildlife corridors, providing food and shelter for many wild animals. These uses must be considered when planning pest control programs on transmission lines or pipelines.

Removal of vegetation may be accomplished by mechanical means, such as mowing. Chemical methods may also be used, taking into account adjacent

Railroad right-of-way goals include:

- Preventing weed spread to adjacent lands
- Reducing potential fire hazards
- Maintaining or improving visibility
- Maintaining safety for work crews

Chemical controls are generally used to keep railroad tracks, signals, switches and signage bare of all vegetation.

Public utility right-of-way goals include:

- Prevent weed spread to adjacent lands
- Reduce potential fire hazards
- Maintain or improve access for maintenance and emergencies
- Maintain wildlife food, shelter and travel corridors

If the adjacent areas are used for livestock grazing, applicators must check pesticide labeling to ensure compliance with grazing restrictions.

Vegetation management on utility and pipeline rights-of-way should focus on maintaining low-growing plants that are best adapted to the local soil, water and climate.

Construction site right-of-way goals include:

- **Preventing weed movement and controlling weeds onsite**
- **Preventing weed spread to adjacent lands**
- **Reducing potential fire hazards**

land uses and the multiple uses of the right-of-way itself. Weeds, especially noxious weeds, must be controlled to prevent spread to adjacent lands. In sensitive areas, ground equipment can be used to provide more controlled applications of herbicides. Special care should be taken in areas near homes, crops, feed lots, reservoirs and locations where the right-of-way crosses highways, railroads or streams. If adjacent areas are used for livestock grazing, applicators must check pesticide labeling to ensure compliance with grazing restrictions.

Tall vegetation may interfere with visibility and routine maintenance, and can contribute to fire potential. Selective applications of herbicides should be used to reduce or eliminate taller vegetation while maintaining lower-growing plants that do not interfere with site goals. Vegetation management on utility and pipeline rights-of-way should focus on maintaining low-growing plants that are best adapted to the local soil, water and climate. Establishment of stable, low-growing ground cover will minimize required maintenance. Of course, the low-growing plants must not add to the fire hazard potential at the site.

Facilities related to power lines or pipelines may require more stringent vegetation removal programs. Pole yards, electrical transformer stations, electrical substations, pumping stations, etc. may require complete vegetation removal to reduce fire potential and for security reasons.

Construction Sites: New construction sites are another type of right-of-way that requires pest management plans, primarily for weeds. The main goals at these sites include reducing fire hazards and preventing the spread of weeds. As with all the other types of rights-of-way discussed previously, weeds, especially noxious weeds, must be controlled to prevent spread to adjacent lands.

Construction sites related to road building and maintenance often disturb adjacent vegetation. To prevent erosion and weed invasion, these areas are often re-seeded, or materials such as gravel or mulch are used to prevent erosion. Seed and other material applied to construction sites should be certified weed-free. See http://agri.nv.gov/Plant/Noxious_Weeds/NV_Certified_Weed_Free_Producer_Links/ for listings of weed-free materials suppliers.

In most cases, temporary weed management will be followed by permanent landscaping after construction is completed. Keep the eventual site goals in mind when selecting control methods. Mechanical control methods, such as mowing, tilling and grading, should not interfere with landscaping plans. Short-residual chemical controls may also be used.

Other Types of Rights-of-Way: Other sites that may require right-of-way weed control include hiking trails or paths, bike paths, bridle trails or paths, snowmobile trails, etc. The portions of these paths or trails that are within parks or private lands are covered by the regulations and restrictions set by those authorities. Trails and paths that exit the originating jurisdiction then become rights-of-way. As with all previous rights-of-way discussed, weed control plans must take into account adjacent land uses. Weeds, especially noxious weeds, must be controlled to prevent spread to adjacent lands. These types of rights-of-way generally occur in urban to suburban areas, increasing the potential for publicity and protest by adjoining land users and owners. Many of these areas may also be near water bodies. Thoughtful planning and implementation is required. Use materials according to their label directions, use common sense and know the goals of the application.

Protecting Adjacent Sites from Pesticides

Many rights-of-way sites are long and narrow and pass through many different types of land uses. It is vitally important to be aware of adjacent land uses and modify the pesticide application accordingly. Caution should be used when applying pesticides, especially herbicides, in areas susceptible to wind and water erosion, because herbicides can be transported into waterways and onto susceptible vegetation and crop land. Pesticide residues that persist in soil for long periods can prevent the establishment and growth of plants and may leach into groundwater and surface water. The rate at which herbicides and other pesticides break down in soil varies greatly and depends on several factors, including soil type, pH, moisture and microbes, and exposure to sunlight. To work properly, some herbicides must be incorporated into the soil mechanically. This exposes germinating seed to the herbicide and protects the herbicide from sunlight.

The presence of adjacent sensitive vegetation is a common concern when applying herbicides along rights-of-way. These areas may include landscaping, forests, wildlife habitat, cropland, orchards, pasture or other forage, and rangeland. Use care when applying pesticides in these areas and consider the adjacent land uses when formulating a pest management plan.

Bare ground is often the desired result in some right-of-way sites, as well as driveways, fence lines and property lines. Preemergence herbicides or soil sterilants are often used to achieve bare ground. However, misusing these products can result in injury or death to nearby non-target vegetation. The root zone of trees and shrubs can extend well beyond their branch spread or canopy. Trees growing in or adjacent to fence lines, driveways or property boundaries often have roots extending well into those zones. Herbicide

Other types of rights-of-way include:

- **Hiking trails or paths**
- **Bike trails or paths**
- **Bridle trails or paths**
- **Snowmobile trails**

Goals of other types of rights-of-way include:

- **Preventing weed spread to adjacent lands**
- **Reducing potential fire hazards**
- **Protecting adjacent water bodies**

Many rights-of-way sites are long and narrow and pass through many different types of land uses. Be aware of the adjacent land uses when formulating a pest control plan for your right-of-way.

Many plant roots extend far beyond the drip line of the plant. Using preemergence herbicides can damage them. Use caution when using preemergence herbicides and soil sterilants.

Some herbicide labels prohibit application to water, either directly or through drift. Check product labeling if applying pesticides adjacent to aquatic sites.

Preemergence herbicides detected in groundwater:

- bromacil
- diuron
- simazine
- atrazine
- prometon

To protect groundwater, do not apply leachable herbicides in areas where soils are permeable. Consider other control methods or alternate products.

applications in those sites may result in death or injury to desirable vegetation. Read labels carefully. Some products have specific label language prohibiting the application of the product in the root zone in order to protect trees and other sensitive vegetation.

The topography of the right-of-way and the adjacent sites must also be considered in the pest management plan. If the right-of way or adjacent site is sloped, use care when removing all vegetation, as this can lead to soil erosion. Using selective herbicides that leave desirable vegetation in place is a better choice in this situation than complete vegetation removal.

Many pesticides can be corrosive to metals, so use care around automobiles, metal guard rails, buildings or other metal surfaces.

Protecting Surface Water from Pesticides

Right-of-way sites often extend over, or are located adjacent to, lakes, rivers, streams, ditches or other waterways. Many herbicides are not approved for use in water, and product labeling will instruct the user not to apply the product directly to water, and not to allow the product to drift into water. It may be necessary to obtain a pesticide discharge permit under the Clean Water Act if a pesticide application is made near a surface water body.

Aquatic organisms and downstream users of the water may be negatively impacted. Illegal herbicide application can result in serious environmental contamination and enforcement actions. See the Category F: Aquatic Pest Control chapter of this manual for more information on the safe and lawful application of pesticides in or near surface water. See

<https://ndep.nv.gov/water/water-pollution-control/permitting/nevada-pesticide-application-program> for more information on permits.

Protecting Groundwater from Pesticides

Sampling and monitoring for pesticide residues in groundwater is a major component of the Nevada Department of Agriculture's pesticide program. As a result of normal use, registered pesticides used on right-of-way sites are frequently detected in water samples collected from a network of monitoring wells throughout the state. Detections include the preemergence herbicides bromacil, diuron, simazine, atrazine and prometon. All of these products have a high potential for leaching and contaminating groundwater. Pesticide labeling advises applicators not to use these products in areas where soils are permeable and subject to leaching.

Applicators can protect groundwater and help to reduce contamination by using other control options, such as mechanical and cultural methods. When

herbicides are used, newer alternative pesticide products less likely to leach into water supplies should be considered.

Methods of Control

Weed control is the major focus of most right-of-way pest management efforts. It is imperative that you correctly identify the weed or weeds you are trying to control, as well as understanding the life cycle of the weed(s). Several control methods are generally needed to achieve good results.

Control methods fall into five distinct categories: prevention, cultural, physical or mechanical, biological and chemical. In general, physical or mechanical control methods are considered short-term controls, while chemical and biological methods generally provide longer-term control.

Many factors should be considered when deciding on control methods for rights-of-way:

- Accessibility and safety of pesticide applicators and others
- Adjacent desirable vegetation (crop, pasture, ornamental, etc.)
- Proximity to urban areas, sensitive vegetation, surface water or groundwater
- Livestock, wildlife and human use of the right-of-way and adjacent land
- Cost

Prevention: Prevention is the most effective weed control method. This involves keeping weeds out of a new or an existing site.

- Use only certified weed-free seed when replanting or overseeding.
- Inspect all mulches to make sure they are weed-free, or use certified weed-free mulches.
- Use weed-free sand, gravel and fill materials.
- Make sure weed seed and perennial plant parts, especially roots and other underground plant parts, are not carried into new areas by contaminated machinery. Remove mud, dirt and plant parts from project equipment before moving into a new project area. Collect seeds and plant parts and incinerate them, or bag them and send them to a landfill.
- Inspect, remove and properly dispose of weed seeds and plant parts found on clothing and equipment before leaving an infested project site.
- Control weeds prior to seed set. Hand-pulling a few weeds before seeds set or roots spread will prevent an infestation and reduce work in the future. Catching an infestation in the early stages, when plants are few, will stop new weeds from becoming established.

Cultural Control: These are practices that prevent or reduce weed infestations by making the conditions favorable for desirable competitive

Methods of control:

- **Prevention**
- **Cultural**
- **Physical or mechanical**
- **Biological**
- **Chemical**

Preventing weed introduction and spread is the most cost-effective method of managing weeds.

Cultural controls make conditions favorable for desirable vegetation that can compete with weeds.

Using mechanical controls on perennial weeds that spread by the roots can make infestations worse.

Biological controls rely on living organisms to manage unwanted vegetation, and the results may not be quick enough to meet goals.

Herbicides can be effective tools when used in conjunction with other weed management strategies.

vegetation and unfavorable for weeds. Cultural controls include planting competitive native species, overseeding, proper sanitation and mulching. Planting competitive native species helps to reduce weeds by providing competition for space, nutrients, water and light. Overseeding fills in bare spots with new plants. Use caution when overseeding. Select species that will not outcompete existing desirable species at the site. Proper sanitation includes removing dead vegetation to reduce both weed seeds and fire hazards. Proper sanitation also includes removing disease- or insect-infested plants to reduce the spread of the disease or insect. Mulching helps by excluding light, reducing seed germination, and inhibiting the growth of weeds. Mulches are effective in smaller areas but may not be a realistic method of cultural control for the long expanses in some rights-of-way.

Physical or Mechanical Control: These methods include hand-pulling, hoeing, blading, mowing, disking, tilling, burning and flooding. They are considered short-term control methods. While they work well for annual and biennial weeds, they are not very effective for perennial weeds that have extensive root systems. In fact, for some perennial weeds, blading, disking and tilling may *increase* the weed population. Many noxious perennial weeds spread by both root and seed. For these types of weeds, cutting or tearing a plant root into many small pieces can generate many new plants. Burning must be done carefully and thoughtfully to prevent accidental fires. Burn permits may be required. Flooding is not always possible, and the risk of spreading weeds with floodwater may outweigh any benefits.

Biological Control: Biological control uses living organisms, such as insects, animals or pathogens, to control undesirable vegetation. It is another tool that can be incorporated into a comprehensive pest management program. Biological control is considered a long-term approach, and is rarely effective at eradicating an entire infestation. Biological controls generally are used to reduce infestations to an acceptable and manageable level.

Although most biological controls are inexpensive to maintain, they do take time to become established, usually lagging behind the rate of infestation. Repeated annual or regular releases of the biological control organism into an infested site may be required for effective control. This method is called augmentation. Most biological controls are species-specific, controlling only one species of plant or insect. Biological controls are a tool used in conjunction with other pest management methods.

Routine monitoring is needed to track success or failure of biological control organisms. Sometimes a single release is all that is required. Record the locations of biological control organism releases. Do not apply pesticides at these sites while the biological control agent is becoming established.

Chemical Control: Chemical control of weeds involves the use of herbicides, which are useful tools that should be used in conjunction with other methods. Successful weed management programs use several control strategies and do not rely on herbicides alone to do the job. Many herbicides used in the right-of-way also have specific uses in cropland and other sites. Extreme care must be used when applying herbicides to rights-of-way that are adjacent to croplands, ornamental and turf areas, water, and sensitive sites in order to avoid unintended damage.

The active ingredients in pesticides are the chemicals that control the pest. Pesticides are sold in a variety of formulations, which can be divided into finished products, ready-to-use products and products that require dilution. Pesticide product formulations may include one or more active ingredients plus other inert ingredients. Some common formulations include dry flowables, emulsifiable concentrates and wettable powders. There are also granular products that can be applied directly to the site without mixing in water. If you find that more than one formulation of a pesticide is available for your pest control situation, you must choose the best one for the job.

READ, UNDERSTAND AND FOLLOW THE LABEL DIRECTIONS.

When selecting herbicides, several factors should be considered:

- Weeds present. As with all pest control, you must first identify the pest.
- Objectives for the area. What level of control is desired: bare soil, some vegetation, no grass, only grass?
- The leachability, or potential for lateral or downward movement of the herbicide away from the treatment site.
- Adjacent land uses and sensitive sites (crop, pasture, ornamental, water, etc.).
- Human, livestock or wildlife use of the right-of-way and adjacent lands.

Other Pests in Rights-of-Way

Most other pests are not common problems along rights-of-way. Occasionally, burrowing rodents can cause damage to right-of-way sites, such as roads and roadsides. Prevent rodent damage by using traps and/or rodenticides. Rodent management options are outlined in the General Knowledge: General Pest Problems chapter of this manual.

Another pest that occasionally presents a problem on rights-of-way is the Mormon cricket. These insects have cyclic populations. During peak population booms, they can present hazards along roads and other rights-of-way, both by consuming vegetation in the right-of-way and adjacent sites and by creating a slippery road surface as they attempt to cross and are

When selecting chemical controls, consider the goals for the site, including bare ground, specific vegetation, etc., and be aware of adjacent land uses and sensitive sites.

**Phytotoxic:
poisonous to plants**

Be sure to read, understand and follow the pesticide label directions.

Occasionally, burrowing rodents can cause damage to right-of-way sites, such as roads and roadsides.

It is important to report Mormon cricket infestations to the Nevada Department of Agriculture (NDA) using the form found at this link:

https://agri.nv.gov/uploadedFiles/agrinvgov/Content/Resources/Forms/Plant/Entomology/mc_gh_form_2013_4.pdf

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https://agri.nv.gov/uploadedFiles/agrinvgov/Content/Resources/Forms/Plant/Entomology/mc_gh_form_2013_4.pdf. Reporting to the NDA helps in controlling the current infestation and in predicting future infestations. Control Mormon crickets using baits or other insecticides. Choose the control method carefully to ensure safety of nearby people, their pets, domestic livestock and wildlife.

Conclusion

Rights-of-way are distinct areas involved in the transport of people, goods and services. There are many goals when managing rights-of-way. Safe access is important, as are fire prevention, visibility, erosion control and safety for workers and the general public. Weeds, especially noxious weeds, must be controlled to prevent weed spread to adjacent lands. Aesthetics become an important factor in and around urban areas.

Rights-of-way are generally long and narrow and pass through areas with different soil types, vegetative communities, topographies and sensitive sites. Many rights-of-way are limited in size or purpose. For example, some road widths are mandated not to exceed a certain size. The differences in use and in physical attributes make a “one-size-fits-all” solution to right-of-way pest control impossible. Pest management will vary from site to site.

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