

Brush and Weed Control on New Mexico Ranges

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Noxious woody and weedy plants occupy much of New Mexico's ranges. One cause is preferential grazing by domestic livestock and wildlife. The more palatable species of plants are grazed and weakened, and the ungrazed plants that are left gain an advantage. Overgrazed and cultivated areas left to revert to native vegetation without seeding are prime areas for noxious plants to become established. Excessive erosion, trampling, and bedding of animals also result in bare areas for noxious plants to become established. In some areas, these plants may be a natural part of the environment.

Objectives

The purpose of noxious plant control is to reduce coverage of undesirable plants at an economically feasible cost. This will in turn increase levels of light, water, and nutrients for forage production, or will at least prevent a potentially denser stand of noxious plants.

Eradication of most noxious plants is usually not economically feasible. It is more realistic to try to reduce noxious plant numbers and hold them at a low level for an extended period. In other words, the



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objective is to provide species of a higher ecological value through plant replacement.

With poisonous plants, livestock losses may make a control program a higher priority than increased forage production.

Finally, livestock management in areas where brush has been controlled is easier than in areas infested with brush and weeds.

Plan a Control Program

Before beginning any control effort, evaluate the potential productivity of the rangeland, as well as follow-up management possibilities. Grazing must be deferred following noxious plant control if forage plants are to regain their vigor and increase production. If necessary, plan a short- and long-term treatment/retreatment and grazing management program.

Basic Considerations

Species of Plant to Be Treated

Most species of plants have one method of control that is most economical. A method that kills one species may not control another. The location and method of reproduction, such as a sprouting bud zone or prolific seed production, vary among plants and affect the choice for best control method. The depth of root systems also influences the method used for control.

Growth Stage of the Plant

There are periods (usually of short duration) when plants may be susceptible to a specific treatment; this is especially true when using chemical herbicides. For mechanical work, a fall treatment may be best because the plant must battle the elements throughout the winter. A spring or summer mechanical treatment often allows a plant the best chance for regrowth.

Plant Condition at Treatment Time

Don't spray plants under stress. Plants must be actively growing and have adequate soil moisture to continue growth for a period of time.

Other Plant Species in the Treatment Area

Evaluate all species present, such as:

- Primary undesirable species, i.e. the target species.
- Secondary undesirable species that may take over when the dominance of the primary species is removed, or that will increase in density during removal of the primary species, such as happens with rabbitbrush on sagebrush-dominant range.
- Desirable forage species you wish to protect, which may require the use of a selective control method.

Site where the plant is growing. The type and depth of soil, slope, exposure, and presence or absence of excess water may restrict the type of control selected. A dry site may be the easiest place to kill a plant but the most difficult area to reestablish desirable forage plants. Areas of low potential productivity may be left as wildlife areas.

Generally, chemical control methods are most efficient on sites with coarse- to medium-textured soils. These soils may be prone to erosion when treated by mechanical means.

Density of stand. Scattered plants can be treated economically on an individual basis. Dense stands of single or mixed species may require a broadcast treatment due to the labor costs.

Determine the Best Method of Control

There are four general methods of noxious plant control: chemical, mechanical, biotic, and burning.

Chemical. The chemicals most commonly used for control of noxious plants are oils, liquid herbicides, and dry (powdered or pelleted) materials. Oils are used primarily for basal treatment of individual trees or stump treatment of sprouting trees. Fortifying the oil with a hormone-type herbicide tends to improve the level of control. Dry or liquid herbicides are also used on individual plants, but are generally limited to light stands. The liquid hormone-type or dry herbicides can also be applied as a broadcast. Because of the low rate needed, these herbicides are especially useful on dense stands of noxious plants. Application can be made with aerial or ground equipment.

With chemicals:

- Follow the directions on the label.
- Comply with herbicide regulations in your area.
- Practice herbicide safety.
- Low volatile esters, amines, and dry herbicides are less likely to drift to other areas and damage non-target crops.
- Pounds per gallon applies to the relative strength of the material, e.g., material that is 4 pounds per gallon acid equivalent means that each quart contains the relative strength of 1 pound of herbicide.
- Percent active ingredient of dry herbicides indicates the relative strength of the material, e.g., material that is 20% active ingredient means that each pound of dry material contains 0.2 pounds of herbicide (5 pounds of dry formulated material are needed for 1 pound of herbicide).
- A reliable certified applicator may be the most important factor in controlling noxious plants.
- Reduce drift by applying liquid materials when winds are less than 5 to 8 miles per hour and temperature is below 85°F.
- Apply the recommended rate; the old adage “If a little is good, a whole lot is better” **does not apply**.

Mechanical. This method involves any treatment that physically damages the plant or removes it from the ground. Mechanical methods may be grouped as follows.

Hand methods are the oldest and often the most effective mechanical control methods, but they are slow and costly. **Grubbing** consists of digging out the plant and its root system. **Cutting** with an ax or other tool is effective on some species that do not produce basal or root sprouts. **Girdling** consists

of cutting the cambium layer (under the bark) in a ring around the tree trunk, thereby stopping the movement of sap and nutrients.

Power methods utilize a wide range of equipment, from power saws to tractors. The cost and/or labor is often reduced, but the high cost of equipment makes many mechanical methods especially expensive. Power saws have the same general application as hand cutting and girdling.

Tractor **dozing** is one of the more effective methods of controlling larger trees and brush because it pushes or pulls the plants out by the roots. Dozers may use the straight dozer blade, blades with teeth, or a V-shaped “stinger” attachment. This method is most applicable on open stands of larger trees or on rocky soils where other mechanical methods are limited.

Chaining is a relatively cheap method of control, but may only have temporary or limited effectiveness, especially on sprouting species. Anchor chains with links each weighing 80 pounds or more are pulled behind two tractors. Chaining obtains the greatest kill of plants when used on single-stemmed trees that are at least 10 feet tall and roughly the same age. Moist soils usually make removing plant roots easier. The main advantage of chaining is the low cost.

Railing and **cabbling** are used on some species as a substitute for chaining. These techniques are similar to chaining; railing uses railroad track segments and cabling uses metal cable. On small, limber trees and shrubs in dense stands, chaining, railing, and cabling may be less effective because the vegetation causes the equipment to skip or “ride-up” and miss smaller plants.

Chopping is done with a roller equipped with cutting blades. This method is usually temporary since it kills few plants and resprouting soon follows.

Disking is done with a large plow or tandem disk that plows up brush. This method is usually limited to small, shallow-rooted shrubs and plowable soils. Areas that are plowed usually require reseeding.

Mowing and **shredding** are temporary control methods adapted to small-stemmed brush and weeds. Repeat treatments are often necessary.

Root plowing cuts off the brush 18 to 24 inches below the ground using a horizontal blade pulled

behind a tractor. This method is best for areas of thick, mixed species of brush. Areas that are root plowed should be reseeded.

Biotic. Biotic methods use one living organism to eat, damage, or kill another. There are numerous examples of biotic control, but success in finding suitable insects or animals with a narrow range of hosts is limited.

Livestock may be considered a form of biotic control since they consume selected weeds and browse plants at certain growth stages in variable amounts. Cattle and elk normally consume 80% grass and 20% browse and weeds. Consumption by sheep is reported at 60% grass and 40% browse and weeds. Antelope eat large amounts of weeds, while goats and deer consume more browse and less grass. However, not all weeds and brush are palatable to livestock or wildlife.

The use of insects and other organisms for biotic control is being studied. Few successful treatments currently use biotic methods.

Burning. Burning is an effective but sometimes dangerous and hazardous treatment and must be used with utmost care. Constructing fire lanes and providing adequate fire control equipment are necessary to prevent wildfires. Weeds and browse are injured more by fire than are grasses due to the location of the growing points; the growth point on grasses is near the base of the plant, whereas in weeds and brush the growth point is on the extremities. The soil should be cool and moist with the grass plants dormant to successfully control noxious plants and preserve forage plants.

Noxious Plant Control Benefits

- Improved range condition
- Greater forage and livestock production
- Greater ease of working livestock

- Lower labor requirements
- Increased number and weight of offspring
- Increased food for wildlife
- Improved watershed condition

The most effective and economical control program is often a combination of methods. In most cases, the noxious plant problem has built up over time. Therefore, do not expect the problem to be controlled by one treatment. By using the best techniques available at different times of year, you can make the best use of available labor and equipment.

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Kert Young is an Extension Rangeland Brush and Weed Specialist at NMSU. He has experience controlling invasive plants with mechanical, chemical, cultural, and other techniques. His Extension and research work helps the people of New Mexico understand how to manage invasive plants and repair damaged range and pasture lands, and benefits land condition, productivity, sustainability, and profitability for an improved quality of life for New Mexicans.

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