Controlling Annual Weeds on Rangelands

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The professional range manager looks at rangelands as having many values, and he manages them with a policy of multiple use. These lands not only produce much of the red meat consumed in the United States, but they also serve as home for wildlife, as recreation areas, and as watersheds. With these many uses, it is logical for some plants to be considered "out of place"—and therefore "weeds."

Because of the large areas involved, the low per-acre value of the range, and the high costs of weed control, it is not likely that most annual range weeds will be eradicated completely. Large quantities of weed seed are carried over in the soil for many years, complicating control. Hence, we approach the problem with the idea of finding the most sconomical and practical method of living with the weed problem. The problem becomes one of plant ecology —replacing an undesirable plant with a desirable forage species.

On the range, some annual plants may be considered weeds for a variety of reasons. Many such range weeds provide poor quality forage, competition with better forage plants, high fire hazard, unsightly appearance, and some have poisonous properties. Some weed plants also serve as alternate hosts, harboring pests that attack crops.

Most annuals are usuable as forage plants during at least part of the growing season, and are the basis of many ranching operations. During much of the year, however, their quality is poor. In many areas, both forage quality and total forage production can be increased by seeding the range to perennial grasses, and in California by seeding to annual legumes.

Downy Brome

One of the most widespread annual weeds is downy brome, which is common in northeastern California and throughout the intermountain west. This grass is known also as cheatgrass or bronco grass. Downy brome has replaced sagebrush and native perennial grasses on sites that have been disturbed by fire, cultivation, drought, and overgrazing. The grazing quality of downy brome is good only for a very short period in the late spring or early summer.

The author looks at stolon-forming wheatgrasses which, with good grazing management, will give a permanent cover that can keep out downy brome or a sage invasion.

The perennial hardinggrass will not only provide earlier feed to fill a winter shortage, but it will crowd out summer weeds as well. Here, the author inspects a new variety of hardinggrass called Perlagrass.

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Then it dries, becomes low in forage quality, and presents a high fire hazard. Fire is easier to start and travels much faster on downy brome ranges than on sagebrush or perennial grass ranges.

Wheatgrass as Replacement

The best control practice is to replace downy brome with perennial grasses. The best grasses for this purpose are wheatgrasses. Commonly used wheatgrasses are crested wheatgrass, pubescent wheatgrass, and intermediate and tall wheatgrasses. These, the result of introductions from Siberia by United States plant scientists in the early 1930's, have been improved by breeding or selection, and varieties are available commercially ar reasonable cost.

When planting wheatgrass, downy brome presents a problem. Since downy brome is extremely competitive with the wheatgrass seedlings, control measures must be taken. Common weed control practices include spring cultivation and seeding, or fall seeding after 1 year of cultivated fallow. Cultivation in the fall is not satisfactory, because downy brome usually does not germinate until late fall or early spring.

Newer techniques include use of the herbicide paraquat applied during the seeding operation in the spring, or use of a soil-active herbicide such as atrazine to provide a 1-year fallow prior to seeding in the fall. The advantage of these newer techniques is that they may be used on soils which are too rocky to cultivate, or too steep and subject to an erosion if cultivated.

If properly managed, the wheatgrass will reduce the fire hazard, and also will provide quality forage much longer than downy brome. Grazing by cows from April 15 to June 15 in northeastern California has nearly eliminated the downy brome from stands of Topar pubescent wheatgrass and Greenar intermediate wheatgrass. In this case, the grazing animal is an important weed-control "tool". If not grazed, the downy brome may occupy the space between the wheatgrass plants and continue to be a problem.

The same principle of using a replacement plant species to control annual weeds applies to the milder climate of California away from the mountains, where a vast number of annual grasses and broadleaf plants dominate the scene. Again, most of these plants are valuable forage during part of the year, but are of poor quality after they mature. Some weedy annual grasses, such as medusahead and wild barley, become unacceptable to livestock when dry, because of a coarse beard. Replacing these weed species not only gives control, but may double or triple the amount of forage produced and improve its quality.

Annual Legumes

Annual legumes, particularly rose clover and subclover, are the key to combining weed control with increased forage yield and quality in this mild climate. These legumes, properly inoculated, are able to use nitrogen from the air and increase forage yields to amounts greater than the range produced before medusahead became a problem. The annual legumes also are good summer feed. Even when dry they have a protein value of 10 to 13%, compared with 3 to 5% for the weedy annuals. The large quantity of clover seed produced is also attractive to game species such as quail and doves.

Seeding legumes is only part of the key to weed control, as control is only temporary. The nitrogen fixed on the roots of the clovers by the bacteria becomes available to all plants. The weeds, if not controlled, will benefit from this fertility and crowd out the clover. Annual grasses are particularly bad because of their upright growth which shades out the clover. If these grasses are not kept in check, the clover may completely disappear in one season.

The best weed-control tool for this problem is the grazing animal. Continuous year-long use will keep the weeds in check and allow the clover to flourish. If the grazing animals are too few to keep up with the weedy growth, various herbicides may be used.

Summer weeds such as tarweed and yellow star thistle are another common problem on California ranges. These deep-rooted plants survive on moisture remaining after the shallower-rooted annuals have matured. Of course, the summer weeds can be killed by spraying, but such control will be temporary, since viable seeds are present in the soil for many years.

Hardinggrass—a Replacement

Again, the answer is a replacement species—one that competes for the deep moisture. Hardinggrass, a deep rooted perennial grass, is used for this purpose. A bonus with this weed-control practice is the extra winter feed produced by hardinggrass while the annuals present are starting from seed.

Control of resident annual weeds must be excellent for establishment of hardinggrass, as it has a very weak seedling. The resident annuals may number as high as 100 plants per square inch. These can be controlled by deep cultivation in the spring, or by fall cultivation after the seed have germinated. A newer technique involves the use of paraquat to control the weeds without cultivation. A heavy-duty planter has been developed which will spread phosphorus and sulfur fertilizer and plant the seed any place a crawler tractor will pull it. This includes many places which are too steep or rocky to cultivate. Paraquat from a sprayer mounted on this planter is used to kill a band of vegetation over each planted row. Bands of living vegetation are left between seeded rows for erosion control and forage production. Annual legumes are seeded along with the hardinggrass to provide an inexpensive source of nitrogen.

Poisonous Range Plants

Plants poisonous to livestock are sometimes controlled by spraying, but again, complete eradications of even the annual species is difficult because of seeds in the soil. The poisonous annual broadleaf weed, halogeton, is sometimes controlled by spraying, followed by seeding to wheatgrasses. Soil disturbance during the seeding operation, however, actually may increase the spread of halogeton. For this reason, newer seeding techniques which do not require cultivation but which rely on herbicides for weed control, should be considered.

Poisonous range plants are difficult to eradicate because of their wide distribution. Most range livestock managers have learned to avoid areas containing serious infestations of poisonous plants, especially when the animals are very hungry. Most poisonous plants are not highly palatable, and will not be eaten unless the livestock are forced to do so by hunger.

Weeds Harbor Diseases and Insects

Range plants may be hosts for disease organisms or insects which are a problem on adjacent croplands. Russian thistle and some mustards are the alternate hosts for the beet leaf hopper, which is the only known carrier of curly top, a destructive virus disease of sugar beets, table beets, beans, tomatoes, spinach, melons, flax, and ornamental flowering plants. Russian thistle has been sprayed or grubbed from rangeland on the west side of the San Joaquin Valley in California for over 20 years. Rangelands adjacent to agricultural areas on the Snake River Plains of southern Idaho and eastern Oregon have been seeded to crested wheatgrass in an effort to control both mustards and Russian thistle, which increases following fire or heavy grazing of downy brome or sagebrush ranges.