Rangeland Weed Control through Management

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On-the ranch evidence that effective control of stubborn weeds is possible through properly planned range management practices comes from the Jackson Soil and Water Conservation District (SWCD) in Oregon. Field studies have shown that certain range management practices, in combination with new plantings, can be effective in controlling yellow starthistle and winter annual grasses such as ripgut bromegrass in southern Oregon.

Evaluation of standard field plantings in the Jackson District revealed that many plantings had either not become well established while trying to compete with these weeds, or had become extensively infested after establishment. From interviews it was determined that in many cases the ranchers were applying ammonium sulfate fertilizer to their grass stands each fall when the soil was dry and firm for equipment travel. In the wheatgrass stands, the applied nitrogen fertilizers was either used by the winter-active weedy grasses, or was leached out by winter rains. Very little of the fertilizer benefited the winter-dormant wheatgrasses.

Field observations indicated that good moisture conditions and high nutrient levels in the soil produced good crops of weeds, but not particularly good production of desirable range forage. The challenge was to find a system(s) that would allow the desirable forage species to outcompete the weeds.

Ben F. Roche, Jr., professor of forestry and range management at Washington State University in Pullman, Washington, had shown that starthistle could be controlled in good stands of perennial grasses such as crested wheatgrass and 'Whitmar' beardless wheatgrass by adjusting the grazing to limit available light to starthistle plants during critical periods. Roche’s study indicated that starthistle requires ample sunlight and that south and southeast facing slopes provided the best exposure to sunlight. Also the starthistle plants, beginning to grow out of the rosette stage in late spring, need good direct sunlight to grow to maturity. This light requirement meant that delayed spring grazing could effectively control starthistle.

An important growth aspect of starthistle plants is their ability to produce a taproot during the winter months—generally the full depth of the soil profile. In many cases the 4 to 6-inch diameter rosette could produce a taproot 4 to 6 feet deep, enabling the mature plant to draw moisture from the full soil profile the following summer. Attempting to control starthistle by introducing shallow-rooted perennials and annuals to compete for the available soil moisture would be unsuccessful. However, limited success could be expected by introducing deep-root perennials such as the wheatgrasses.

It was believed that the most successful control of starthistle would come from a two-front attack: (1) Delay spring grazing of deep-rooted perennial wheatgrasses during the starthistle’s critical light period; (2) Allow sufficient time for the wheatgrass regrowth to use all the available soil moisture during the period when starthistle normally produces seed.

On a ranch near Ashland, Oregon, a 4-year-old field planting of ‘Largo’ tall wheatgrass was completely infested with many species of grass and herbaceous weeds. The wheatgrass plants were very weak and only about 4 inches tall, even after 4 years of growth.

To test the ability of a mature, well-managed stand of wheatgrass to suppress weed infestation first required that the stand become healthy and mature. Another valuable tool entered the picture—herbicides. With the advice and cooperation of the Medford Branch Experiment Station, two pounds per acre of simazine was applied in the fall of 1979. The result was complete weed control and the wheatgrass responded by producing over 5,000 pounds dry matter/acre of available forage every year since then. In addition, the proper management of this healthy stand of wheatgrass has provided good starthistle control and prevented reinstatement of winter annual grasses.

Similar results were observed at other field plantings. On a ranch near Eagle Point, Oregon, delayed spring grazing of tall wheatgrass and fall grazing of the regrowth is producing 2,450 pounds dry matter/acre annually with good weed control. At a ranch in Sams Valley, Oregon, established ‘Oahle’ intermediate wheatgrass with proper weed control produced 2,200 pounds dry matter/acre the establishment year and has continued to produce approximately 3,000 pounds dry matter/acre annually.

Proper management systems need to include delayed spring grazing to keep needed sunlight from the starthistle. Regrowth of desirable plants should be allowed to deplete as much available soil moisture as possible, and any nitrogen fertilizer used should be applied in the spring after the perennial forage plants have begun actively growing. In addition to the system of grazing and fertilizer management, herbicide use, when needed, can assist with establishment of new stands and occasional clean up of old stands.

In summary, keys to success in this weed control are: understanding of the various growth stages of the undesirable plants, proper selection of desirable forage species to be introduced, and management of the rangeland to favor the growth needs of the desirable forage instead of the weeds. Field trials in the Jackson Soil and Water Conservation District are demonstrating that well established, deep-rooted perennial grass stands will control starthistle and suppress other troublesome weeds through proper management systems.