Principles for Managing Ranges Infested with Halogeton

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Proper management of grazing lands often requires increasing the density of palatable forage species or reducing the density of weedy species, especially poisonous weeds. Grazing practices, reseeding, herbicides, and other techniques can be used to these ends. Usually, a successful technique rests on knowledge of the life cycle, ecological requirements, and physiological capabilities of the plant being manipulated. We must have such basic information about halogeton to manage grazing land in our cold desert region. This annual plant, poisonous to all classes of grazing animals, was introduced from the cold deserts of Asia. It has invaded more than 10 million acres of desert in the northwestern United States. It invades disturbed soils where native shrub cover is absent, thin, or low in vigor. Overgrazed sites, abandoned farmlands, highway and railroad rights-of-way, and trails made by domestic and game animals provide suitable habitats. Vigorous perennial vegetation prevents halogeton’s invasion and can crowd it out on infested sites. Management practices should be designed to prevent halogeton’s invasion by maintaining healthy vigorous stands of perennial forage plants, by reseeding with perennial forage plants, and preventing soil disturbance areas.

Halogeton, a prolific seed producer, typically produces about 75 seeds on each inch of stem. A large plant can have more than 1500 inches of stem. Halogeton can produce 200 to 400 lb/acre of seed. There are approximately 572 thousand seeds in each pound. The plant produces two types of seed, black seeds and brown seeds. Brown seeds constitute about one-third of the total production.

The black seeds germinate readily whenever sufficient moisture and heat are available. A few will germinate as soon as they are free from the bracts but a greater percentage will germinate following a short afterripening period. Black seeds are viable for about 1 year in the field. The prolific production of black seed provides a means of rapid spread of the plant once it invades a suitable site. Production of black seed occurs from about the middle of August until growth stops and the plant dries in late September. Plants which become established after August 15 produce black seed exclusively.

Halogeton produces brown seeds from about July 1 until mid August, but both brown and black mature in late September. Brown seeds are viable but they do not germinate readily. Only a small percentage germinate each year and they persist in the soil for at least 10 years. Brown seeds provide a means of species survival during long periods of severe drought. This longevity profoundly affects management and control programs. These brown seeds assure the persistence of halogeton on any site where it has produced a seed crop. Control measures will fail unless this characteristic of the brown seed is recognized.

Reinvansion by plants originating from black seed is relatively simple to prevent. Prevention of seed production on a site for a single year should remove all viable black seed. But prevention of reinvasion by plants from the brown seed require a long-term vigorous follow-up program.

Halogeton is a serious problem on the cold desert because it possesses numerous qualities adapting it to life in this harsh, uncertain environment. Its anatomical structure permits very little water loss through its aerial parts. Where the lack of water limits or prevents the growth of most plants, it thrives. It germinates, grows, and prospers on soils too saline for any other desert plants. Not only does halo-
The Bushland Range Interseeder

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Highlight

A range interseeder was designed and constructed at the Southwestern Great Plains Research Center in 1960. The results show promise on heavy soils as well as light ones.

During the past decade, range interseeding has become an accepted practice for restoring depleted rangeland. In 1953 the Colorado Agricultural Experiment Station designed a furrow type seeder for establishing grasses in existing stands of vegetation (Hervey, 1960). The U. S. Soil Conservation Service developed an interseeder in 1954 (Schumacher, 1964), and the University of Wyoming developed a tiller-seeder for interseeding work in 1955 (Becker, McNanee, and Lang, 1956). From the principles in these three original designs, many interseeders have been developed and used.

Although range interseeding has been successfully used on a wide range of sands and light textured soils; interseeding in clay, caliche, or other heavy soils has been more of a problem. A range interseeder (machine #SW-4) was constructed at the Southwestern Great Plains Research Center in 1960. It has shown promise in all soil types.

The general design of the Bushland Interseeder is similar to that of the Wyoming Range Seeder described by Becker, Lang, and Rauzi (1957). The Bushland machine consists of a double tool bar on which two 10-inch sweeps are mounted. Gauge wheels are mounted on the rear tool bar to control the depth of undercutting of existing vegetation. Seeding units are mounted behind the sweeps. Pickerwheel type seedboxes are mounted above the seeding units for large and trashy types of grass seeds; and a small, four-compartment, fluted wheel seedbox is used for small grass and legume seeds. Two different sizes of grass seed can be planted simultaneously.