ever, the untreated plots were not severely damaged in this experiment.

Both planting method and N fertilization affected the timely availability of soil nitrogen to the plant which is an important factor controlling seed production. The availability of nitrogen affects grass seed-head formation, seed set, and seed quality (Smika and Newell, 1965, 1966).

Cultural practices are necessary for seed production of side-oats grama and should include planting in rows approximately 40 inches apart, supplemented by suitable irrigation, fertilization, and insect control. Harvesting seed from solid stands and stands of side-oats grama not receiving cultural practices should be discouraged because of the poorer quality seed harvested from these stands.

LITERATURE CITED


Reclaiming Brushland in Southwestern Alberta

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Highlight

Brush invasion of grasslands continues to be a serious problem in southwestern Alberta. As moist draws and slopes are invaded by brush, the amount of forage available for grazing is decreased. Mechanical control is usually practiced although chemical control has been utilized in control of willow or aspen regrowth.

The Parkland of Alberta extends as a fringe along the foothills and northeastward as a broad belt across the southwestern Alberta 85 years ago. Soils of the area range from Black through Dark Gray Chernozemic to Degraded Brown Wooded and occur under rough fescue, aspen, and Douglas fir, respectively (Dormaar and Lutwick, 1966). The Black Chernozem is thought to be the soil type from which were derived different soils under invading trees. The biotic changes that resulted in differences among soils of the area caused a progressive loss of organic phosphorus and nitrogen and lowered soil fertility (Lutwick and Dormaar, 1968).

The reduction in yield of forage as a result of brush invasion is of concern to the rancher. The brush competes strongly with grasses for space. Clipping data indicate that aspen groves yield about 400 lb/acre of forage under a closed canopy compared with about 1200 lb/acre on adjacent fescue prairie. Land prices of the region range from $85 to $105/acre and hence, with carrying capacities of 1.5-2.0 acres per Animal Unit Month, these yield reductions cannot be permitted to continue.

Clearing of woody species has been confined to more productive soils of valley bottoms and gentle slopes. Aspen and willow are “walked down” by bulldozer during the winter (Fig. 2), piled, and later burned. Usually the land...
is broken and cultivated for a year or two to control regrowth of aspen or to prepare a seedbed in cleared willow sites. A cereal crop may be seeded during these years and utilized for pasture, hay, or grain. The land is then seeded to an adapted grass-legume mixture, for example, Carlson bromegrass Bromus inermis Leyss. and Rambler alfalfa Medicago sativa L. Russian wild rye Elymus junceus Fisch. and Rambler alfalfa have been seeded on shallower soils, especially when fall and winter pasture was required. The bromegrass-alfalfa mixture averages about 3500 lb/acre while the Russian wild rye-alfalfa mixture averages about 2500 lb/acre. Other adapted grasses include: intermediate wheatgrass Agropyron intermedium (Host) Beauv.; subcent wheatgrass Agropyron trichophorum (Link) Richt.; timothy Phleum pratense L.; reed canarygrass Phalaris arundinacea L.; green needlegrass Stipa viridula Trin.; and crested wheatgrass Agropyron cristatum (L.) Gaertn. Alsike clover Trifolium hybridum L. is widespread throughout the region.

Herbicides, usually 2,4-D ester applied at 32 oz/acre, have been used to kill willow and aspen regrowth (Fig. 3 and Fig. 4).
Cover Photo). Regrowth is seldom a problem after thorough breaking with a moldboard plow, heavy serrated disks, or a rototiller.

Bloat is a hazard where cattle are grazed on grass-alfalfa mixtures but ranch managers of the area feel that the additional forage obtained warrants some additional risk. Ranchers frequently comment that clearing and seeding of brushland should not be started until enough capital is available to complete the job. (Costs range from $10 to $60/acre (Figs. 4 and 5).) Much money has been wasted in partial clearing without follow-up operations.

Our observations indicate that brash invasion is still actively underway and that, within the southwestern Alberta Parkland, the rate of conversion of grassy range to trees is about 0.75% of the total area per year. A generalized sequence of ecological succession appears to be from grass to willows to aspen to conifers. Willow is susceptible to 2,4-D. Thus, we recommend that local infestations of willow be controlled with chemicals before stands grow to where mechanical clearing becomes necessary. Elimination of the early willow infestation will greatly lessen the likelihood of aspen becoming established.

LITERATURE CITED


Soil Information for Range Resource Evaluation

E. WILLIAM ANDERSON

Highlight

Soil is a major physical component of the ecosystem. To ignore soil or treat it superficially merely restricts knowledge of the resource. The amount of soil detail needed depends upon the character of the landscape, the complexity of the resource, the uses to be made of the survey data, and the amount of money available to do the job. Too much soil detail should be avoided and too little detail may make the survey worthless for evaluating the range resource. There is flexibility in how soil mapping units can be designed to meet the needs.

Grazing resource inventories historically have been made solely on the basis of existing vegetation. Some inventories of this kind still are being made. In other inventories, soils are considered but the quality of these considerations often is superficial. Resource people generally recognize the dire need to discontinue this approach. We rangeland people should emphasize the need for adequate soil information in range inventories. We also should avoid too much soil detail because this generally results in indefensible costs and confused interpretations.

Need for Soil Information

Why do we need reliable and adequate soil information as a part of a grazing resource inventory?

First, soil is one of the major physical components of the ecosystem. To ignore soil or to treat it superficially merely restricts our knowledge about the resource.

Second, soil provides one reliable criterion by which areas that look differently or alike today due to past treatment and successional stages of vegetation can be related to the original ecosystem. Vegetation can be altered by such influences as fire, drought, and overgrazing, singly and in combination. As stages of recovery or deterioration take place, transitional plant communities develop. Therefore,