

MANAGEMENT NOTES

Reclaiming Brushland in Southwestern Alberta

A. JOHNSTON AND S. SMOLIAK

*Range Ecologists, Research Station,
Canada Department of Agriculture,
Lethbridge, Alberta.*

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 southern part of the Province to the Saskatchewan border. It consists of a mosaic of prairie and aspen *Populus tremuloides* Michx. groves, with prairie occupying the drier situations and aspen the more moist and sheltered locations. Smaller Parkland areas occur in the Cypress Hills, the Hand Hills, and the Peace River region (Moss, 1955).

In southwestern Alberta, rough fescue *Festuca scabrella* Torr. prairie characterizes the drier sites, groves of willow *Salix* spp., aspen and black poplar *Populus trichocarpa*

T. & G. the moister sites, and coniferous trees such as Douglas fir *Pseudotsuga menziesii* (Mirb.) Franco, limber pine *Pinus flexilis* James, lodgepole pine *Pinus contorta* Loudon var. *latifolia* Engelm., and white spruce *Picea glauca* (Moench) Voss the ridgetops.

Much of the tree cover of the Parkland is of recent origin (Fig. 1). There was little brush on the rangelands of 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

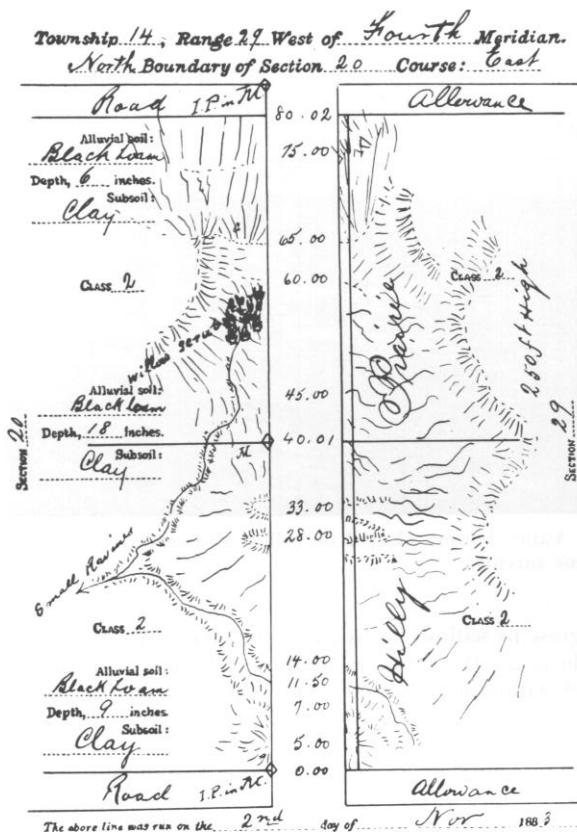


FIG. 1. An 1883 survey line (left) and the same mile-long transect as it appeared in 1966 (right).

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, Carlton brome grass *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

brome grass-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.; pubescent 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. 2. Bulldozer "walking down" aspen in winter.



FIG. 3. Spraying aspen regrowth.

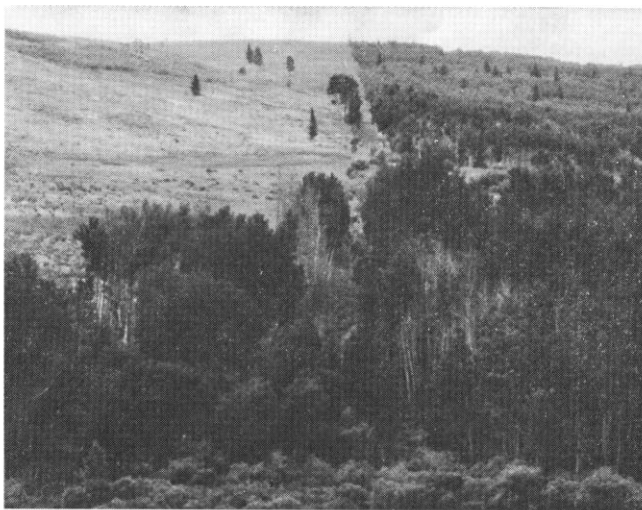


FIG. 4. Cleared area seeded to a grass-legume mixture (upper left) and uncleared brush-covered range.



FIG. 5. Valley bottom cleared of willow and seeded to a grass-legume mixture.

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 \$40 to \$60/acre (Figs. 4 and 5).) Much money has been wasted in partial clearing without follow-up operations.

Our observations indicate that brush 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

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