TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE Boise, Idaho SOIL CONSERVATION SERVICE

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The information in this technical note is from a Journal of Range Management article entitled, "Influence of Season and Intensity of Defoliation on Bluebunch Wheatgrass Survival and Vigor in Southern British Columbia," authored by Alastair McLean, Range Ecologist and Sandra Wikeem, Ecology Technician, Agriculture Canada Range Research Station, Kamloops, B.C.

The results should be applicable to much of our sagebrush-wheatgrass region of Idaho 1/

SURVIVAL AND VIGOR OF BLUEBUNCH WHEATGRASS

Purpose of Study

The purpose of the study was to compare bluebunch wheatgrass response to a number of clipping regimes which incorporated different times, frequencies, and intensities of defoliations in order to determine when bluebunch wheatgrass is most susceptible to injury.

Study Areas

The study areas were in southern British Columbia within the big sagebrush (Artemisia tridentata) bluebunch wheatgrass zone. Elevations ranged from 960-3650 feet. Average annual precipitation ranged from 9.5 inches at the lower elevation to 12.0 at the upper elevations. The site was judged to be in near excellent ecological condition.

Treatment Method

Treatment was a series of defoliation by clipping to various intensities and frequencies. Plants were clipped weekly during period of treatment schedule. A control (no defoliation) was included both for phenological development and a natural mortality check. The experiment was repeated for 3 years.

Clipping treatments in this study do not realistically simulate cattle grazing; however, the study does show bluebunch wheatgrass response to defoliation at varius times throughout the growing season and does indicate times of greatest susceptibility. Plant survival and vigor was evaluated the summer following defoliation.

1/ Interpretation made by Robert J. Baum, State Range Conservationist, SCS, Boise, Idaho.

Results

Greatest injury was incurred by treatments involving defoliation to a 5-cm (2-inch) stubble height from mid April to the end of May or from early May to mid June at the low and high elevation sites, respectively. Reduced injury occurred from treatments which left 10 or 15-cm (4 or 6 inch) stubble heights or which ceased defoliation earlier in the season. No appreciable damage was incurred by fall clipping to 5 cm (2 inches) or by season-long defoliation to 20 cm (8 inches). Injury resulting from spring plus fall as compared to spring only defoliation was inconsistent.

This study supports earlier studies that show total herbage removal in late spring incurred great mortality and subsequent reduction of vigor. The time of greatest susceptibility appears to correspond with the late boot or "heads emerging" stage of bluebunch wheatgrass phenology. At this stage carbohydrate reserves were low and the plants were unable to regrow.

Carbohydrate concentrations in bluebunch wheatgrass roots and stem bases reach the annual minimum either during the middle of the spring vegetative stage or during the early boot stage. Bluebunch wheatgrass is notably slow to reach carbohydrate seasonal minimums and produces proportionately more spring growth than some other species. Thus, the combination of defoliation at a vulnerable stage, bluebunch wheatgrass's apparent reliance on reserves for spring growth, and the inopportunity for reserve replenishment before the usual summer dormancy almost ensures that plants subjected to late April through May clippings at lower elevations and early May to mid June at higher elevations, enter winter in a carbohydrate-depleted stage.

Reference

Journal of Range Management, Volume 38, No. 1, Jan. 1985. "Influence of Season and Intensity of Defoliation on Bluebunch Wheatgrass Survival and Vigor in Southern British Columbia by Alastair McLean and Sandra Wikeem.