Developing a Jointed Goatgrass Management Program for the Intermountain West

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Jointed Goatgrass

Jointed goatgrass (Aegilops cylindrica) is an annual invasive grass weed that infests winter wheat fields in the western United States, resulting in reduced wheat yield and quality. Jointed goatgrass infestations can reduce wheat yields up to 30%. In 2003, yield losses due to jointed goatgrass infestations for the Intermountain region, including Utah, southern Idaho, and parts of Nevada, were approximately 139,000 bushels of winter wheat.

“The jointed goatgrass has become one of the most devastating weeds to infest winter wheat and other cereal grains in Utah and other winter wheat-producing areas.”
Troy Price 1996, USU MS Thesis

The Intermountain Region

In the Intermountain Region: including Utah, southern Idaho, and eastern Nevada growers are mostly obligated to include fallow seasons every two to three years to accumulate and ensure sufficient moisture to produce winter wheat. Approximately three decades ago some management options became available or mandated to wheat producers that conserved moisture and reduced soil erosion which probably exacerbated the invasion of annual weedy grasses in this crop. Agronomic field conditions favoring winter wheat are also ideal for jointed goatgrass. Consequently it became crucial that alternative crop rotations, amended tillage regimes, or other cultural adjustments be identified.

What did Intermountain West weed scientists consider while developing Best Management Practices for Jointed Goatgrass?

Management Practices
- Prevention
- Cultural Control
- Physical Control
- Chemical Control
- Biological Control – None
- Integration of Practices

BMP OUTCOMES

Prevention
- Education
- Certified seed – genetic purity
- Clean equipment – tillage, planting, harvest
- Tarp trucks – roadside spread
- Treatment of feed - grinding
- Hybridization – between species, among varieties

Cultural Controls
- Crop rotation – alternative, spring crops
- Fertilizer placement – broadcast vs. banding
- Fertilizer application timing – spring vs. fall
- Seeding factors – seed size, seeding rate, seeding date

Physical Control
- Tillage – effective, balance with conservation
- Mowing – seed head suppression
- Burning – controversial, smoke issues, surface only, compliance issues

Chemical Control
- Summer Fallow or non-crop – non-selective
- Herbicide tolerant varieties – IMI wheat
- Herbicides in alternative crops

Integration of Practices
- No single component effective
- BMP’s – multiple strategies
- Integration of tactics over multiple years

Conclusions
- Extensive efforts within the Jointed Goatgrass program provided management options
- Jointed Goatgrass Best Management Practices were developed and published for the Intermountain Region
- Inquiries into jointed goatgrass management have declined significantly
- Authors of the bulletin were: Michael Quinn, Don Morishita, Jack Evans, Ralph Whitesides, and Tony White

In addition to reducing jointed goatgrass populations, a unique market for safflower as high quality birdseed provides an economic incentive to include it in the rotation (illustrated in Figures 1 and 2 below).

Figure 1. Jointed goatgrass densities over time in different crop rotations studied over two 6-year periods in northern Utah and southern Idaho. Rotations were wheat-fallow (W-F) and wheat safflower-fallow (W-S-F).

Figure 2. Net profit for 6-year crop rotations in northern Utah and Southern Idaho. Rotations were wheat-fallow (W-F) and wheat-safflower-fallow (W-S-F).