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Establishing a sustainable vegetation ecosystem to replace noxious weeds

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Dealing with the revegetation of disturbed or degraded land is always a challenge that requires a systems approach to be long-lasting and successful. The system of combining a herbicide for weed control with a reseeding program has been tested at the University of Wyoming for 12 years and is providing excellent weed control with only the initial herbicide treatment.

Dealing with weed problems requires a prescription herbicide treatment before establishing a highly competitive perennial grass. Grasses should be cool-season, have moderate desirability for livestock and wildlife and establish well on difficult sites. They should be well adapted to an area and be long-lived. To determine most suitable grasses growers should visit the NRCS Plant Materials Center in their area to look at grasses best adapted for a revegetation site.

Vegetation management requires a different strategy for each weed species that can dominate if managers fail to properly establish perennial vegetation. Three types of weeds are always present no matter where we work. Those are annuals, biennials and perennials. Each species within these groups have to be managed a different way to give the most economical, successful and long-lasting vegetation management system. A herbicide must be applied at the proper stage of growth for the best and most economical control. Annual bromes or annual broadleaved weeds are best controlled before they produce seedheads.

Biennials such as musk thistle work best after all new seedlings have emerged but prior to the controls for two-year-old plants bolting or producing a seed stalk. If a control is effective in preventing seed production and can be uniformly applied every other year, eventually the seed bank will be exhausted and no new plants can come up.

Perennials such as Russian knapweed and leafy spurge are most effectively controlled shortly before or after the first major killing frost in the fall. At that time sugars are being stored in root systems for winter survival and herbicide applications even at reduced rates still take advantage of this natural translocation period.

The principle change we have made in the past 20 years in weed management has been the focus on the establishment of perennial grasses and forbs. Several examples of

revegetation replacing various weed problems have been done in Wyoming. These same problems are not as dominant in the eastern part of the U.S., but the principles of revegetation are very similar. Leafy spurge is a deep-rooted perennial that dominates over 3 million acres in the northern U.S. It is now adapting to areas of New Mexico and the Midwest. Solid stands near the Devil's Tower close to Sundance, Wyoming have been controlled with perennial grasses such as Luna pubescent wheatgrass and Bozoisky Russian wildrye for 12 years without herbicides, only grass competition. Grasses establish best in firm fine seedbeds with seeding depths less than 1/4 inch.

Perennial weeds such as Canada thistle grow best on moist soils near waterways and drainages. Grasses such as Regar brome are much better adapted in these sites which have higher moisture. Perennial bromegrasses are more effective competitors on highly productive sites. Dalmatian toadflax, a newcomer in the western U.S. is spreading rapidly on various disturbed sites. This species can be controlled following a killing frost with 1 quart of Tordon or 0.5 lbs active ingredient (a.i.) of picloram/acre. Grasses seeded in early spring before toadflax can reestablish itself have been very competitive for the past three years following establishment. With an integrated approach using insects for maintenance or retreating areas with a herbicide, grasses can be maintained for an indefinite period of time.

Russian knapweed is found on sites having shallow water tables such as river bottoms or irrigation canals. Control of this perennial weed species can be done following a killing frost in autumn using herbicides such as Tordon or picloram at rates of 1 pint to 1 quart or 0.25 to 0.5 lbs ai/acre, Transline at 14 fluid ounces/acre, or Curtail at 2 quarts/acre. These applications should be followed by reseeding grasses such as Bozoisky Russian wildrye or Luna pubescent wheatgass in the spring.

Studies conducted on dry sites such as Riverside, Wyoming, receiving less than 10 inches of precipitation each year, show us that seeding Luna pubescent wheatgrass, hycrest crested wheatgrass and Sodar streambank wheatgrass will effectively control downy brome, an annual, as well as musk thistle (a biennial).

On weed competition studies conducted on public lands such as the Grand Teton National Park revegetation is limited to the use of only native perennial species. Research studies are beginning in parks and on public land with native grass species such as thickspike wheatgrass, Idaho fescue, western wheatgrass, bluebunch wheatgrass, mountain brome, slender wheatgrass and big bluegrass.

In the future we need to continue using a systems approach for weed management including insects, along with herbicides and grass competition to limit the spread of weeds on public areas and rights-of-way. We all have a lot to learn but I feel very committed to using a systems approach rather than a single tool approach such as a herbicide to provide long-term weed management.