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CRESTED WHEATGRASS: HERO OR VILLAIN IN RECLAIMING DISTURBED RANGELANDS

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Crested wheatgrass may be the most useful and controversial grass currently used in rangeland seedings. To some, crested wheatgrass is a remedy capable of curing a wide variety of rangeland ills. To others, it is an exotic species associated with the livestock industry and whose use on federal lands should be drastically reduced or eliminated. This fact sheet describes the positive and negative attributes of crested wheatgrass use in Nevada and provides some considerations for its use.

BACKGROUND

The term crested wheatgrass is commonly used in reference to Standard crested wheatgrass *(Agropyron desertorum)* and/or Fairway crested wheatgrass *(A. cristatum)*. Both grasses are native to Russia and Siberia and were brought to United States in 1898 as part of a program to discover valuable new plants for use in this country. It was nearly 35 years before crested wheatgrass was used on a large scale and in a meaningful way in the United States.

Although the need for reseeding Nevada's depleted rangelands with grass was recognized as early as 1896, the first successful seedings were established in 1940 with crested wheatgrass. The lack of suitable equipment to control big sagebrush and effectively plant seeds in rangeland settings precluded large scale reseeding efforts until 1950.

Following development of the rangeland plow and seed drills, crested wheatgrass was extensively planted by federal land management agencies in Nevada. Their primary purposes were to increase livestock forage on depleted rangelands and to control the spread of halogeton, a poisonous plant. From the mid 1950's to 1972, approximately one million acres of Nevada's big sagebrush rangelands were reseeded with crested wheatgrass.

In the early 1970's, large scale crested wheatgrass seeding efforts on federal lands stopped. This curtailment of activity happened because of opposition from environmentally concerned organizations. Currently, crested wheatgrass continues to be planted on Nevada's federal lands, but on a much reduced scale and for reasons other than increasing livestock forage on depleted rangelands. However, it remains a staple ingredient of seed mixes used on private

rangelands and mine land reclamation projects.

USES OF CRESTED WHEATGRASS

Crested wheatgrass has been used for a variety of purposes in Nevada. Some of the most noteworthy uses have been for:

- Livestock Forage: Crested wheatgrass provides an estimated 10% of Nevada's rangeland livestock forage. Of particular importance is that it provides a consistent source of early spring forage which is often limited in Nevada.

- Revegetation of Disturbed Areas: Crested wheatgrass is often times a major component of seed mixes used to revegetate mine sites, highway road cuts, and burned areas. It has been successfully established on a wide range of disturbed areas in Nevada.

- Weed Control: Crested wheatgrass is one of the few plants adapted to Nevada's conditions that can effectively control and/or prevent the establishment of invasive annual rangeland weeds such as cheatgrass and mustards.

- Greenstripping: Crested wheatgrass is planted to serve as a fuel break to control the spread of rangeland wildfires.

POSITIVE ATTRIBUTES

As implied by its extensive and varied use, crested wheatgrass possesses a number of positive attributes. The most prominent of these are:

- Adaptation: Crested wheatgrass is well adapted to much of Nevada's rangeland.

- Longevity and Resilience: Crested wheatgrass is long lived, persistent, and endures adverse management.

- Desirable Forage: Crested wheatgrass consistently produces high quality spring and often fall forage for livestock and some big game species. Because its stiff stems poke through the snow, it serves as a winter forage on some pasture. It is tolerant of heavy grazing.

- Ease of Establishment: It demonstrates strong seedling vigor, germinates under a wide range of conditions, and successfully establishes under less than ideal conditions.

- Highly Competitive: Crested wheatgrass is very competitive as both a seedling and mature plant. Unlike many native grasses, it can successfully establish in the presence of cheatgrass and other invasive annual rangeland weeds.

- Availability and Low Cost: Crested wheatgrass seed is readily available and relatively inexpensive. Also, the wide variety of cultivars allows custom fitting to site conditions and goals.

- Not Invasive: Crested wheatgrass usually does not escape from areas where planted and invade adjacent areas.

- Reduced Fire Hazard: Prolonged green period, clumpy growth habit, and reduced presence of annual grass weeds combine to make crested wheatgrass less flammable than the pre existing plant community.

- Over time shrubs often invade crested wheatgrass seedings which increases habitat for shrub dependent wildlife.

NEGATIVE ATTRIBUTES

Unfortunately, several of the positive attributes associated with crested wheatgrass can be viewed as negative. These, as well as other negative attributes, are as follows:

- Highly Competitive: Once established, crested wheatgrass may prevent native vegetation from recolonizing the site, or limit its abundance.

- Longevity: It is a long lived grass and may dominate the site for the foreseeable future.

- Loss of Biodiversity: Crested wheatgrass, particularly when it exists as a large monoculture, often reduces the variety of plant and wildlife species inhabiting the site.

- Reduced Aesthetic Value: Crested wheatgrass seedings, when established in large squarish blocks surrounded by native rangelands, are readily visible from great distances. This looks bad to some people.

- Reduced Habitat Quality: Establishment of crested wheatgrass often requires removal of the existing shrubs. This action adversely effects wildlife species dependent upon the shrub component for food and cover.

- Non Native: Crested wheatgrass is not from to Nevada. To some, this is sufficient reason to discontinue its use.

DECISION MAKING

Should crested wheatgrass be used to revegetate degraded rangelands in Nevada? Revegetation specialists use five criteria to assist in selecting appropriate plant species. These five criteria and the manner in which they relate to crested wheatgrass and Nevada conditions are presented below.

- Adaptation: A plant selected for use in revegetation must be adapted to the environmental conditions of the site. Crested wheatgrass is best adapted to areas receiving at least nine inches of precipitation annually, but will establish on areas receiving as little as six to seven inches. It will grow on soils of low fertility and moderate levels of salts.

- Initial Establishment Characteristics: The ability to germinate and grow rapidly during the early spring season is critical if a seedling is to successfully compete with the annual weeds that occupy many of Nevada's rangelands. Unlike many native grasses, crested wheatgrass germinates and grows rapidly very early in the spring.

- Compatibility: The compatibility of the selected plant with others in the seed mix is an important consideration. Crested wheatgrass is a highly competitive species and where it is well adapted, may become the dominant species of the revegetated area. If a diverse plant composition of shrubs, grasses, and forbs is the revegetation goal and it is feasible when considering the other two criteria, crested wheatgrass should be excluded. If a less diverse plant composition is acceptable, or if crested wheatgrass with scattered shrubs and other plants is more diverse than

other options, crested wheatgrass may be a major component of the seed mix.

- Functional Utility: Functional utility refers to the ability of the plant to accomplish land use goals while also meeting the criteria of adaptation, initial establishment characteristics, and compatibility. If re-establishment of the native plant community is the goal, use of crested wheatgrass may be inappropriate because it is an introduced species, highly competitive, and persistent. On the other hand, if the goals are to defer grazing of adjacent native rangelands, provide rapid ground cover to control soil erosion, or reduce the wildfire hazard, then crested wheatgrass would have a high functional utility.

- Practicality: If a plant is not available in sufficient quantities or is so expensive or risky to establish that large scale revegetation is not feasible, it may be to impractical to use. Crested wheatgrass seed is usually readily available and is relatively inexpensive. Furthermore, a wide variety of cultivars (e.g. Nordan, Fairway, Hycrest, Ephrim, Siberian, Ruff, and Parkway) are offered. Each cultivar has different characteristics and adaptations which is useful in meeting specific revegetation goals.

Conclusion

Revegetating areas where the native plant community has been disturbed or removed can be challenging in many areas of Nevada. Unfortunately, revegetation attempts using native plants have often times proven impractical or ineffective. Crested wheatgrass has demonstrated a rather unique ability to meet many of our revegetation goals. It is not, however, a panacea. In areas where restoring the native plant community is desirable, possible, and practical crested wheatgrass should not be used. As with all plants, crested wheatgrass can be a hero or villain depending on how and where it is used. Decisions concerning crested wheatgrass use should be based on good information and its ability to accomplish revegetation and management goals.

Further reading on this subject:

DePuit, E.J. 1986. The Role of Crested Wheatgrass in Reclamation of Drastically Disturbed Lands. IN:K.A. Johnson ed. Symposium Proceedings. Utah State University. Logan, Utah. P. 323-330.

Johnson, K.A. 1986. The Social Value of Crested Wheatgrass: Pros, Cons, and Tradeoffs. IN:K.A. Johnson ed. Symposium Proceedings. Utah State University. Logan, Utah. P. 331-336.

Sharp, L.A. 1986. Crested Wheatgrass: Its Values, Problems and Myths. IN:K.A. Johnson ed. Symposium Proceedings. Utah State University. Logan, Utah. P. 3-6.

Urness, P.J. 1986. Value of Crested Wheatgrass for Big Game. IN:K.A. Johnson ed. Symposium Proceedings. Utah State University. Logan, Utah. P. 147-154.

Young, J.A. and Evan, R.A. 1986. History of Crested Wheatgrass in the Intermountain West. IN:K.A. Johnson ed. Symposium Proceedings. Utah State University. Logan, Utah. P 21-26.