

PLANT COMPETITION – THE CORNERSTONE OF WEED MANAGEMENT PART 3: SEEDING CONSIDERATIONS

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As discussed in the first in this series of three Progressive Rancher articles, weed control should always be a means to an end, not an end unto itself. Without desirable competing vegetation, weeds will continue to invade and dominate a site. We should always begin with the end in mind: a desirable plant community that is healthy, functional, and weed resistant. If desirable vegetation is not sufficient to bounce back after weeds have been controlled, we must plant adapted species that will hold the soil and compete with weeds, keeping long-term land-use goals in mind.

In the last issue we discussed seedbed preparation and formulating competitive seed mixtures. In this final installment, we will focus on the following considerations: when and how to plant, determining proper seed depths, the pros and cons of applying fertilizer and mulch, and seeding success and maintenance. For specific information on planting adapted species to compete with invasive weeds, see Chapter 3 in the University of Nevada Cooperative Extension Educational Bulletin-05-02, “Fighting Invasive Weeds – a Northeastern Nevada Landowners’ Guide to Healthy Landscape” on-line at: <http://www.unce.unr.edu/publications/files/ho/2005/eb0502.pdf>.

When to Plant

Seeding should normally be limited to the fall in northern Nevada unless irrigation is available throughout the plant establishment phase, which may be several months long. Seeding during the fall typically meets the cold-dormancy requirements of seeds and stimulates seedlings to rapid growth the following spring. There is also less chance for seed depredation by seed-eating birds, rodents, and insects during this time, as well as the benefit of accumulated winter moisture.

Avoid seeding too early in the fall to ensure that seed germination is delayed until the following spring when the seedlings can take advantage of cooler temperatures and moisture from winter snowfall. Most grass, forb (wildflower), legume, and shrub seeds will survive the winter. However, early fall seedings can be risky if germination does not occur soon enough to allow moderate root development prior to winter. Immature seedlings exposed to freezing temperatures can experience severe winter mortality, particularly in areas of limited snow cover. In northern Nevada, planting should normally be conducted from mid-October through the end of November. Temperatures at this time of year are cool enough to prevent seed germination, and the soils are dry enough for successful planting.

How to Plant

Due to variable terrain and shallow, rocky soils, range plantings are among the most difficult to accomplish successfully. Unfortunately, simply broadcasting seeds on the soil surface unfortunately does not provide the right germination conditions required by most seed species.

Several technologies have been developed to cover seeds during the seeding process. For planting large areas, the use of specialized equipment capable of withstanding rugged conditions may be necessary. Traditional rangeland drills and drag variations are commonly used to place and cover seed (with a thin layer of soil) in rangelands where rugged conditions limit the use of conventional drills. Modern drills equipped with precision seed depth placement and seed monitoring devices perform well on moderately difficult landscapes.

For smaller areas and where sophisticated equipment is not available, landowners can still achieve excellent results by broadcasting the seed manually and covering lightly with soil. Spreading seed with a hand-held “whirly-bird” can be followed up by raking. Some landowners have successfully seeded areas using an electric broadcast seeder mounted on the front of an ATV, with a harrow or even a piece of chain-link fence attached behind to cover the seeds with a thin layer of soil. In some situations, livestock can be moved across the area to trample the seed into the soil.

Seed Depths

Controlling seed depth is essential for a successful seeding. Although recommended planting depths vary with seed size, most grasses do best planted 1/4- to 1/2-inch deep. The general rule is that the smaller the seed, the shallower it should be planted. Some very small grass, forb, and legume seeds should be seeded only 1/8 to 1/4 inches deep. A few forbs and some shrubs do best when broadcast on the surface of roughened soils. Optimum seeding depth also varies with soil texture. For example, on coarse-textured soils such as sands, seeds should be planted deeper than on finer textured silt or clay soils.

Applying Fertilizer

Application of fertilizer on arid rangelands after seeding establishment is not usually recommended. Plants that respond well to short-term changes in the soil brought about by fertilization may fail when the fertilizer is depleted. This failure typically results in a reduction of desirable species and an invasion by noxious weed species. The site should be seeded with species that do not require fertilization for establishment and growth, and thus can continue to thrive without human assistance. Fertilizer is beneficial only during abnormally wet years; applications made during dry years may prevent germination or reduce forage yields and plant vigor.

Nitrogen, often a significant component of fertilizer mixes, is not required for seed germination, but stimulates the growth of cheatgrass and other nitrogen-loving invasive weeds. Therefore, fertilizing the newly planted site at seeding time or in early spring can result in a dense and robust weed infestation.

Fertilizer application may be desirable for irrigated pastures. For a more thorough discussion of this topic, we suggest that landowners request a copy of the “Intermountain Pasture and Hay Meadow Handbook,” (EB-00-03) available from University of Nevada Cooperative Extension offices, or can be down-loaded at:

<http://www.unce.unr.edu/publications/files/ag/2000/eb0003.pdf>.

Mulching

Although mulching may be beneficial in some areas, it is not typically necessary, and may be cost-prohibitive (especially on large areas). For most landowners, the most likely areas for mulch application would be smaller sites that are windblown, southern slope exposures, and other sites that lose soil moisture rapidly.

Mulching involves placing a layer of material on the soil surface to increase soil moisture retention, prevent erosion, moderate soil temperatures, and increase seedling establishment. Although mulching may increase plant cover, density, and biomass in some instances, in other cases it may have no significant influence on plant growth. Of the wide variety of mulching materials, hay and straw are the two most commonly used. When mulching with these materials, great care must be taken to ensure that the mulches are free of noxious weeds that could be unintentionally introduced to a planted site.

Where mulch is used, it should be applied in an appropriate manner, depending on slope, terrain, and access. Methods include manual application, special blowers, and mechanical spreaders. For best results, apply mulch two or three inches deep after seeding and secure it by crimping into the soil using a straw crimper or the equivalent. Hydro-mulching is the most expensive method, but is sometimes used on very steep slopes and/or in areas requiring rapid plant establishment for mitigation against potential erosion.

Seeding Success and Maintenance

Seedlings from fall-plantings should begin establishment in early spring. If spring precipitation is lacking, irrigation (if available) applied several times during the first two months after germination is beneficial. Under normal conditions, dryland seedings should be allowed at least two or three years for complete establishment. The diverse species in a seed mix may have a wide range of germination and growth requirements that will not all be met in a single year. Patience is a necessity when it comes to seeding establishment. If results are less than desirable after the first growing season, landowners may be tempted to plow the site and try again. Repeated soil disturbance of this nature often sets the stage for a new weed infestation.

If the seeded site is intended to be used for grazing by livestock, the area should be protected from grazing and trampling until the plants are adequately established. The root systems must be sufficiently developed enough that grazing will not pull up the plants. On arid rangelands, this typically requires two growing seasons. However, depending on precipitation and site-specific factors, more or less growing time may be required. If perennial plants can be easily hand-pulled, they are not ready to be grazed.

If sustainable livestock grazing of a seeded area is a land-use goal, the landowner should implement a grazing strategy that allows sufficient vegetation recovery for site maintenance. Manage grazed areas, typically through rotation grazing, such that that desirable vegetation is not severely damaged by livestock. Otherwise, re-infestation by invasive weeds is likely to occur. Contact specialists with the USDA Natural Resources Conservation Service or University of Nevada Cooperative Extension for additional information on livestock grazing management.