United States Department of Agricu
NATURAL RESOURCES CONSERVATION SERVICE
Pest Management
Agronomy Technical Note No. 90.1
May 2001

AGRONOMY TECH NOTE

STRATEGIES FOR RENOVATION AND ENHANCEMENT

Richard A. Fasching, State Agronomist

BACKGROUND

Historically, prior to the development of synthetic fertilizers and better tillage/planting technology, alternatives to enhance a grass/legume stand were limited. A producer typically would plow up a stand and complete intensive tillage operations to prepare the seedbed. After controlling weeds for a year or two while growing a cereal crop, he would reseed the grass/legume again. The new stand would produce sufficiently for another 5-10 years and the cycle would start all over again.

Today alternatives are available that will increase production or enhance biodiversity and wildlife habitat without the necessity for intensive tillage operations. These include the use of fertilizers, herbicides, inter-seeding, and a combination of tillage and herbicides strategies.

INTRODUCTION

Renovation and enhancement of grass/legume stands has become increasingly popular with the Conservation Reserved Program (CRP) policy allowing for the renovation of existing CRP stands that are commonly monotypic. Selecting an effective strategy to enhance or renovate a stand and protect against soil erosion at the same time is a challenging prospect in Montana. Because enhancement and renovation strategies vary greatly, the key to selecting an effective alternative is to study how you might approach the challenge.

SELECTING A STRATEGY

Choosing an effective planting strategy and preventing soil erosion can be a very trying experience in Montana considering all of the differences in moisture, elevation, weed populations, existing vegetative characteristics, soil characteristics, soil fertility, equipment needs, herbicide characteristics, individual abilities, and the most unpredictable item—the weather. Montana is famous for its geologic and climatic diversity, therefore, creating one generalized renovation strategy is virtually impossible. Thus, it is essential to have a clear understanding, of the variables that can enter into an effective plan and exploring those variables up front. This holds true for *all* planting strategies across Montana. While each area of Montana offers particular challenges, planting decisions must include distinctive weather patterns, geology, soil conditions, aspect, slope, elevation, and seed source, especially if native species are going to be used.

Species Selection. Many times, a seed variety(s) is selected before planting considerations are taken into effect. Because of the complexity of characteristics in relation to planting in Montana, species selection should be considered after you have determined what the best planting strategy is for a particular area based on the desired objective. For example, different species of seed with their different traits will largely determine when the seed should be planted. Much depends on how each variety handles weather and soil conditions. A "hard seed" variety (% hard seed is listed on seed tags) may require a longer germination period, including the breaking-down action of freezing and thawing, water,

scarification, microbes and enzymes to work on the seed coat and activate germination. Seeding this type of seed in the spring may be a mistake considering the dry growing season conditions typical of many parts of Montana. The best time to seed this type of seed (mixtures with species where a majority of seed is "hard seed") is in the fall as a dormant seeding.

Producers requiring adequate ground cover before summer to protect against soil erosion must consider the amount of rainfall expected through the warmer season, which can vary wildly depending on where in Montana the producer lives (reference MSU Extension Service Bulletin 356, Soil Water Guidelines and Precipitation Probabilities, 1990).

Timing is Everything. The earlier planting can be completed in spring, the better. Many areas of Montana get dry very quickly. To have any impact in these areas, planting must be early, preferably by mid-March. Seed should be in place before spring showers, which are usually short in duration. After that, it is simply too dry for many plants to thrive. In these areas, the best timing may be a dormant planting in the fall.

If a site was properly prepared before freeze-up, seeding on the snow just before it melts may prove to be successful. Melting snow acts like mulch. The snow helps get the seed in good contact with the soil. Although this strategy can be successful, it is more risky than more traditional methods of drilling seed into the soil, especially where soil moisture profiles are already full and snow melt will tend to run off rather than permeate. Remember that use of this method requires double the seed and prior approval by the SRC.

Suitable Soil Temperatures. In areas where the ground is likely to remain frozen for longer periods of time, waiting for suitable soil temperatures is another factor to weigh in consideration of spring planting. For seed to germinate it must have good contact with the soil and be placed in a favorable soil environment. A good soil environment is one that has suitable soil temperature, adequate soil moisture, adequate nutrients, and good aeration. None of these factors alone guarantee germination; rather it is the interaction of these factors that affects seed germination. When it comes to germination of spring-planted seed, soil temperature becomes an important factor since it affects both the capacity for and the rate of germination. Alfalfa will germinate at a soil temperature of approximately 45 degrees, spring wheat at 37 degrees, Rye at 41 degrees, and cool season grasses from 35–48 degrees. It is also important to know these soil temperature guidelines appropriate for germination for dormant seeding purposes. It is essential to plant when the soil temperatures are cool enough so that seeds do not germinate and are then potentially destroyed by sudden cold weather.

Research and experience has shown that interseeding desired native species into aggressive introduced species has had little success unless competition is controlled. Regardless, if you have a dense stand of vegetation it needs to be destroyed in strips, mosaics, or blocks to ensure adequate unsheltered distance to control erosion while attempting to renovate. Success will most often occur on the most favorable landscapes, soils, and moisture regimes. This makes selecting sites where renovation will occur very important.

Some of the best results for destroying existing vegetation involves using both herbicide and tillage for at least one growing season. Excess residue may need to be removed by burning, baling, raking, etc. prior to using herbicides and tillage. This ensures that herbicides can reach the competitive plant's leaf surface and residue built up will not plug tillage equipment. Typically, vegetation needs to have adequate regrowth (approximately 4 inches) before herbicide application to provide optimum leaf area for highest efficacy. Allow adequate time for the herbicide to work (up to one month) and then complete tillage operations. Fallowing for one season will allow multiple herbicide applications and tillage operations, if needed, to adequately control successive flushes of weeds/vegetation. Obviously, the entire seed bank will not be eradicated, but control must be adequate to allow new seedling to grow with as little competition as possible. If existing vegetation is clumpy or a bunch grass species, tillage operations will be needed to thoroughly break apart root crowns and allow for proper decomposition for proper seedbed preparation.

Although there is not a simple recipe approach to renovation, typically, a minimum of one year of tillage and herbicide application will be required to adequately control existing vegetation including CWG. Normally, an additional glyphosate application is required to control fall green up and again prior to planting the following spring.

Studying and then selecting an effective strategy to enhance or renovate an existing grass/legume stand and protect against soil erosion at the same time can be a challenging prospect in Montana. Enhancement and renovation strategies vary greatly. The key to selecting an effective alternative is to study how you might approach the challenge. Understanding the characteristics of a particular site and the characteristics of the vegetation to be planted will ensure success.

REFERENCES:

Holzworth, L. Reminders on Enhancement and Interseeding. Plant Materials Today. April 2001.

Husby, P. Biogram No. 13. March 1997.

Warde, S. Spring Planting. Erosion Control. January/February 2001. Pages 70-77.