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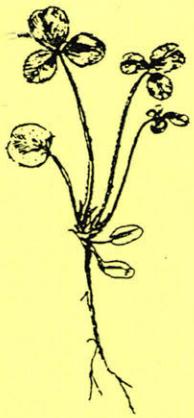

Range Management Fact Sheet



for San Luis Obispo County

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Planting and Managing Range Legumes and Grasses in San Luis Obispo County

Range Seeding Yields Long-Term Results

Although the seeding of rangeland with annual legumes and perennial grasses may seem expensive, a successful seeding, when properly grazed, will last indefinitely. So the increased forage yield and protein content during the long life of a range seeding should make it a wise investment for the livestock producer. In addition, these plants will provide good vegetative cover which reduces soil erosion. Consider also that this practice may quality for cost sharing through the federal Agricultural Conservation Program.

As with any dryland agriculture, however, variable factors such as weather, soil and management cause results to vary. If the weather is very dry the first year, seedling establishment may be disappointing or even a failure. Usually, however, if proven recommendations are carefully followed, some establishment will be made the first year and the stand will improve in following years.

Following are some comments about plant species and a step-by-step list of seeding and management recommendations. For more details, contact the livestock and range farm advisor in your county.

Benefits of Seeded Plants

Annual Legumes. Through the process of nitrogen fixation, legumes in symbiosis with root nodule bacteria called rhizobia use elemental atmospheric nitrogen to make proteins. Annual legumes, such as medics and rose and subterranean clovers, thereby increase forage protein content directly and, when their roots break down, they also contribute nitrogen compounds to the soil for other plants. A dense, vigorous stand of legumes therefore eliminates the need for nitrogen fertilization.

Rose clover derives its name from its upright, round rose-colored blossoms. Subterranean (sub) clover, as its name implies, buries part of its seed-producing burs, thus protecting the seed from close grazing. The annual medics are not true clovers but are members of the Medicago genus which includes bur clover and alfalfa. Their dry seed pods provide protein in the summer for livestock.

Some varieties of these legumes are adapted to areas which receive 8 or more inches of annual rainfall while other varieties require 15 to 20 inches.

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Perennial Grasses. Berber orchardgrass, Palestine orchardgrass, Hardinggrass and Perlagrass, which has greater seedling vigor but more expensive seed than Hardinggrass, extend the green season and increase forage production on ranges with 15 or more inches of annual rainfall. They are especially beneficial during dry years because they are perennial plants with long roots that extract deep soil moisture. This was demonstrated on Hardinggrass range east of Arroyo Grande where annual cattle gains of 100 to 160 pounds per acre were recorded over a seven-year period which included dry as well as wet years.

Hardinggrass and Perlagrass can become clumpy and unpalatable if not grazed enough while in a young stage of growth. The orchardgrasses have finer stems and therefore are less likely to become clumpy.

Since annual legumes and perennial grasses thrive under similar management, they complement each other well in a range seeding.

Preparations before Seeding

Range seedings should be made before November 1 in order to catch the early rains and allow for germination before cold weather begins and competing resident plants begin to grow. Seed and fertilizer should be ordered well in advance since some items may be in short supply. Applications for costsharing from the Agricultural Conservation Program must be approved before work begins in order to qualify for payment. If a range drill or other seeder is going to be borrowed or rented, it is advisable to reserve it in advance.

Recommended Seed Mixtures

Since plant species and varieties vary in season of maturity and their adaptability to different sites, it is advisable to initially seed a broad mixture of species. In later years, it may be more economical and effective to select fewer varieties based on previous results and/or use different mixtures on different sites.

Here are three seed mixtures of varieties adapted to San Luis Obispo County. The rates are in pounds of raw seed (before inoculation) per acre.

On clay-loam soils where annual rainfall is 15 inches or more (most coastal areas):

1	Hykon rose clover
1	Wilton rose clover
2-3	Rosedale, Northam, and/or Nungarin sub clover
2	Seaton Park sub clover
1-2	Mt. Barker sub clover
2-4	Jemalong, Sephi, Serena and Sava medics
2-4	Berber or Palestine orchardgrass (can substitute Perlagrass or Hardinggrass)
11-17	Total pounds per acre for broadcast seeding (Can be reduced to 6-10 pounds per acre for seedings made with a range drill because the seed is concentrated in rows.)

On gravelly or sandy soils and/or where annual rainfall is 10 to 15 inches:

1	Hykon rose clover
0-1	Kondinin and/or Wilton rose clover
2	Rosedale, Northam and/or Nungarin sub clover
1-2	Seaton Park sub clover
2-4	Jemalong, Sephi, Serena and Sava medics
6-10	Total pounds per acre for broadcast and range drill seedings

For areas where soil pH is neutral or basic and annual rainfall is down to 8 inches:

4-8	Jemalong, Sephi and Serena medics
0-1	Rosedale, Northam and/or Nungarin sub clover
0-1	Hykon rose clover
4-10	Total pounds per acre, preferably seeded with a range drill

Legume Inoculation

Legume seeds should be inoculated with the proper nitrogen-fixing bacteria for the species. This is important because many soils lack the appropriate root nodule bacteria for the legumes being seeded.

A recommended do-it-yourself inoculation method is a system called Pelinoc-Pelgel. It is easy to apply, inexpensive and very effective. Six pounds of Pelinoc-Pelgel materials and 2 quarts of water are added per 100 pounds of seed. The seed should be inoculated just before planting.

Seed can also be purchased that has already been pellet–inoculated with peat inoculum coated with calcium carbonate – both held to the seed with an adhesive such as gum arabic.

Seedbed Preparation and sowing

An ideal seedbed is a stubble field that has been farmed to oat hay or cereal grain using good weed control practices. Legumes and grasses may be sown directly into the stubble with a range or grain drill or a Brillion seeder which drops the seed between two ring rollers.

Seeding in the ash of recent burns or on fuelbreaks made with bulldozers or disks can be effective too. Herbicide application may be needed the following spring, after the legume seeds have matured, to reduce brush regrowth.

For broadcast seedings on tilled, loose soil, seed loss to birds and rodents is reduced and germination is more successful if the seed is covered with about 1/4 inch of soil by using a ringroller. Seed shouldn't be buried deeper than 1/2 inch or germinating plants may be unable to reach the soil surface.

Seedings can also be made in established grassland using only a range or grain drill. The low-growing legumes, such as sub clover, respond well to this method if livestock grazing is used to reduce competition from other plants.

Fertilization at Seeding

The amount of fertilizer to be applied at seeding time depends on the available soil phosphorus which can be determined in a commercial soil testing laboratory by the sodium bicarbonate extraction soil test. If this test shows that phosphorus is less than 10 parts per million (ppm), broadcast seedings should be preceded by an application of 50 to 100 pounds of P_2O_5 (phosphoric oxide) per acre. If a drill seeder is used and the fertilizer is placed in a row with the seed, rates of only 20-40 pounds of P_2O_5 per acre are adequate for establishing vigorous legumes. Sulfur application at about one half the P_2O_5 rate is also recommended, so compare fertilizers for sulfur content.

Grazing Management the First Season

Competition from nonseeded plants should be reduced by grazing which keeps the faster-growing weeds and grasses from overtopping the legumes. As a rule, when the soil is not too soft and muddy, a new field should be grazed to about 2 inches until April or May when the legumes are flowering and the annual grasses have headed out. At that time, livestock should be grazed in other fields until the legume seeds are dry and hard.

In the case of sub clover seedings in established grassland, however, livestock grazing throughout the season will control grass competition without harming the low-growing sub clovers. This allows seeding on ranges where livestock removal is impossible or inconvenient.

Grazing and Fertilizing Established Stands

After the first year, graze early each growing season to control competition and later as the forage is needed. Legumes are good dry forage because of their high protein content and palatability.

More stands of clover are lost because of too little grazing rather than too much grazing. So, if a good stand is established the first year and the seed matures, it is usually not necessary to restrict spring and early summer grazing in later years. Seed production in stands of rose clover or medic can be encouraged, however, by restricting grazing when the plants are in bloom and until the seed hardens.

Although legumes provide their own nitrogen, they are dependent on phosphorus and sulfur from the soil. Soil tests can be used to detect phosphorus deficiency but are not reliable indicators of sulfur deficiency. Where phosphorus levels are less than 10-20 parts per million, fertilizing with 50-75 pounds of P_2O_5 and 25-50 pounds of sulfur per acre every three years will usually increase production. Before fertilizing large acreages, trial applications should be made to see if the results justify the cost. A Cooperative Extension farm advisor can suggest the correct way to do this.

Bloat and Estrogen Problems

Although bur clover can cause bloat, problems have not been reported with rose and sub clovers or seeded medics.

Sub clovers contain varying amounts of pigments that can have estrogenic effects on animals. In Australia, estrogen levels of some sub clover varieties in nearly pure stands have reduced lambing percentages. This has not been a problem in California because sub clovers usually are not over 50 to 60 percent of the stand even in the best pastures and varieties high in estrogen have not been widely used.

Cooperative Extension Publications with More Details

Annual Medics for Range and Grain Lands, Range Science Report No. 9

Management of Clovers on California Annual Grasslands, Leaflet 2661

Range-Legume Inoculation and Nitrogen Fixation by Root-Nodule Bacteria, Bulletin 1842

Range Plants Seeded in San Luis Obispo County

Seeded Range Plants for California, Leaflet 21344