

# Fertilizer Guide

FG 4  
Revised April 1983

## SUBCLOVER-GRASS PASTURE Western Oregon (excepting Coos, Curry, Jackson, Josephine counties)

Subclover-grass seedlings constitute the largest acreage of improved, non-irrigated pastures in western Oregon. Grasses recommended for seeding with subclover are perennial ryegrass, tall fescue, or orchardgrass.

Subclover is shallow rooted and fertilizer left from previous phosphate and potash applications will stay in the surface 2" of soil. Soil samples from the surface 0-2" of soil give a good measure of nutrient availability.

The Oregon State University Extension Service agent in your county can provide you with soil sampling instructions, soil sample bags, and information sheets.

Key points in the management of subclover-grass pastures are:

1. Inoculation is critical. Inoculate subclover seed immediately before seeding using the following methods:

Use subclover inoculant which has been refrigerator stored and use inoculant prior to the expiration date on container.

**Sticker:** Dampen seed with sticker, milk, or sugar solution, spread in layer, sprinkle liberal amounts (two or more times the recommended rate) of inoculant and mix thoroughly.

Avoid exposure of the inoculated seed to the sun and plant immediately into moist soil.

2. Recommended seeding methods, rates, mixtures, and varieties should be used.

3. Complete removal of forage and residue during the summer by close grazing, burning, or mechanical harvesting is essential to maintain subclover in the stand.

4. Graze as available or cut as silage or hay before maturity. Hay can be harvested after early spring grazing.

5. Excessive grass growth will crowd out the clover. This is especially true where excess nitrogen has been spring applied and the early growth was not used by grazing animals.

6. A specific schedule to use the forage produced with grazing animals is an essential part of a pasture management program. The grazing schedule should be developed before fertilizer is applied. September nitrogen application can

increase fall and early winter grass growth. Also, February nitrogen application can increase grass growth in early March that can be a substitute for feeding hay. However, if this grass growth is not used, it will compete unfavorably with growth of legumes.

### NITROGEN (N)

N fertilization is not necessary when pastures contain productive stands of subclover. Subclover can furnish N for the grass through N fixation.

N fertilization should not be a substitute for good management, such as proper inoculation and maintenance of good clover stands.

Apply 20 to 25 lbs N/A in September and February when feed is insufficient and where early growth will be grazed (see point 6 above). Ammonium sulfate or 16-20-0-14S applied at this time will also supply the sulfur needs.

### PHOSPHORUS (P)

Soil testing should be used to evaluate the need for P fertilization.

With new seedings P should be banded  $\frac{1}{2}$ " to 1" to the side or below seed, if possible. Some soil should separate the fertilizer from the seed.

In addition to superphosphate, using 11-48-0 to 11-55-0 ammonium phosphate materials to supply P has given good results. Superphosphate and nitrogen fertilizers should not be mixed and used for this application.

When P cannot be banded, it should be worked into the seedbed before seeding.

With established stands P should be broadcast in the fall.

On new seedings and established stands:

| If the OSU soil test for P reads (ppm): | Apply this amount of phosphate ( $P_2O_5$ ) (lb/A): |
|---|---|
| 0 - 10                                  | 60 - 90   |
| 10 - 20                                 | 40 - 60   |
| 20 - 30                                 | 30 - 40   |
| Over 30                                 | None  |

P rates can be reduced 50% where the soil pH is 5.8 or higher and soil test P is above 5 ppm.



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## POTASSIUM (K)

On new seedings K should be worked into the seed bed before seeding. Do not band K with seed. On established stands K should be broadcast in the fall.

On new seedings and established stands:

| If the OSU soil test for K reads (ppm): | Apply this amount of potassium ( $K_2O$ ) (lb/A) |
|---|--|
| 0 to 75                                 | 60 - 100   |
| 75 to 150                               | 40 - 60  |
| Over 100                                | None   |

## SULFUR (S)

The annual fertilizer program should include 30 to 40 lbs S/A. On the "Red Hill" soils 40-50 lbs S/A applied every 3 years gives good results.

Thirty lbs of S can be supplied with 125 lbs of ammonium sulfate or 220 lbs of 16-20-0-14S. These applications can be split (Sept. & Feb.) to obtain maximum efficiency from S with limited clover-grass competition. These NS and NPS materials may be the preferred S source if early pasture is needed and will be used.

Elemental S, gypsum, and single (ordinary) superphosphate supply S.

## MAGNESIUM (Mg)

To date, very few responses from Mg application to subclover-grass pastures have been observed in western Oregon. Trial applications of Mg are suggested when the soil test values are less than 0.8 meq Mg/100g soil. Magnesium can be applied in the form of dolomite lime or magnesium-potassium sulfate, sold as Sul-Po-Mag or K-Mag.

## BORON (B)

Fertilizer materials which contain B should not be banded. B deficiency is less apparent on subclover than on perennial legumes.

| If OSU soil test for B reads (ppm): | Apply this amount of B (lb/A): |
|-------------------------------------|--------------------------------|
| 0 - 0.5                             | 1 - 2                          |
| 0.5 - 1.0                           | 1                              |
| Over 1.0                            | None                           |

## MOLYBDENUM (Mo)

Mo deficiencies usually occur on unlimed, acid soils. Mo can replace the need for lime on some acid soils provided the legume is well nodulated.

Slight excesses of Mo in forage, however, can be toxic to cattle. For this reason the following recommendations for Mo should be closely followed:

1. Mo should not be applied under the following conditions:

P, K, Mg, B, and lime fertilizer recommendations are based on soil test values from the Soil Testing Laboratory, Oregon State University, Corvallis, Oregon.

This fertilizer guide is based on research conducted by T. L. Jackson, W. S. McGuire, T. E. Bedell, E. H. Gardner, and J. A. Leffel; OSU Agricultural Experiment Station and Extension Service.

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When fields have been treated with Mo within 3 years.

Where fields have a pH of 6.0 or higher (including fields that might be limed to 6.0 and higher) except where plant analysis has identified low Mo levels.

To any field where Mo content of clover exceeds 1.0 ppm on a dry weight basis with plant samples of clover leaves and petioles taken about May 1.

2. An application of 6 oz Mo/A (1 lb sodium molybdate) with the fertilizer is recommended where none of the items listed under #1 are applicable.

Chemical analyses of plant samples can be used to identify Mo deficiency and potential Cu deficiency problems. Sample leaf blade and petiole of clover between Apr. 15 and May 5 for the best evaluation of these nutritional problems.

## LIME

Subclover is more tolerant of acid soil conditions than other forage legumes grown in western Oregon; however, effective subclover nodulation and seedling establishment is difficult in strongly acid soil. Therefore, lime is recommended where the soil pH in the surface 2-3 inches of soil is below 5.5.

Liming will not increase yields if effective nodulation does not occur. If effective nodulation does not take place following liming, the field should be reseeded with properly inoculated seeds.

### New Seedings

Where the pH of the surface 2-3" of soil is 5.5 or lower, mix 1 to 2 T/A of lime into the surface 2" of soil before seeding. The use of lime pelleted seed can improve seedling establishment on acid soils. For long term effects the reduction of soil acidity through the application of lime may be necessary.

Where phosphorus is required a lime-superphosphate mixture will improve seedling establishment. In preparing this mixture superphosphate is mixed with an equal amount of lime and allowed to "cure" for 7 to 10 days. The mixture is drilled in contact with the seed.

### Established Stands

Subclover is an annual and reseeds itself each year with the seeds germinating in the immediate soil surface. Top dressings of lime to established stands are, therefore, more effective in the case of subclover than with perennial legumes.

If the pH of the surface 2-3" of soil is below 5.5, a broadcast application of 1-2 T/A lime is suggested for established stands.