

Fertilizer Guide

PERENNIAL GRASS PASTURE (Non-Irrigated) (Western Oregon—West of Cascades)

Under some conditions, perennial grasses are planted for pasture, hay, and silage on many farms in western Oregon. Tall fescue, perennial rye, and orchardgrass are the most productive species. Perennial rye and tall fescue pastures on well-drained hill soils provide late winter and early spring sheep pastures.

Non-irrigated pasture production in western Oregon can frequently be enhanced though the inclusion of a legume such as subclover in the seeding. Fertilizer suggestions for subclover-grass pastures are contained in FG 4 which is available from your County Extension Agent.

The optimum response of grass pasture to fertilization is dependent on good management including:

1. Maintenance of a vigorous stand of improved grasses.
2. Use of good grazing management practices.
3. Avoiding soil compaction by not grazing when surface soil is saturated with water.
4. Control of weeds and other pests.
5. Using recommended seeding methods, rates, mixtures, and varieties.

It is important that the soil be sampled and tested as a guide to fertilization. Follow recommended soil sampling procedures to insure obtaining a satisfactory soil sample. The Oregon State University Extension Service Agent in your county can provide you with instructions on correct soil sampling, soil sample bags and information sheets.

NITROGEN (N)

N is the plant nutrient most frequently required in the fertilization of grass forage in western Oregon.

New Seedings

Band 20-30 lbs N/A - and where required, phosphate and/or potash 1 to 2 inches below seed. At least 1 inch of soil should separate the seed and fertilizer. When P and/or K are required, N can be banded with these nutrients. The total of N plus potash in the band should not exceed 100 lbs/A. Where N cannot be banded, broadcast 40-50 lbs N/A at planting time.

Late winter and early spring pasture

Apply 30 to 40 lbs N/A during September. From 1000 to 1500 additional pounds per acre (dry

weight) of forage should be produced from the addition of 30 to 50 pounds of nitrogen per acre if pastures reach a height of 10 inches before grazing starts. Graze these pastures or cut hay or silage by early June. On dry years utilization should be stopped by May 15. Heavy grazing after growth starts in the fall will reduce the expected early spring yield increase from fertilizer.

Grazing should not start until the grass reaches a height of 6 to 10 inches. Growing conditions during the winter will determine the date to start grazing.

Late spring pasture, hay, or silage

Apply 40 to 60 pounds of nitrogen per acre by March 1. Do not graze until pastures reach a height of 6 to 10 inches. This fertilizer application should increase the yield by 1,500 to 2,000 pounds of dry matter per acre if grazing is delayed until after grass reaches a height of 10 inches.

Late summer pastures

Poorly drained areas and deep (3½ feet plus) well-drained soils with the proper species will produce good pasture for July and August if properly managed. Apply 50 to 60 pounds of N/A between March 1 and April 15 or after the excess moisture has started to drain out of the soil. Graze or cut silage between May 1 and 16. Leave a stubble height of at least 3 inches. This stubble height is essential for summer regrowth. Heavy utilization during early May is essential to keep the grass from going to seed and becoming over mature during late June or early July.

PHOSPHORUS (P)

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

On new seedings, when the OSU soil test for P is below 15 ppm, band 30 lbs phosphate/A 1 to 2 inches below the seed. At least 1 inch of soil should separate the seed and fertilizer. P can be banded with N and K. The application rate should be doubled when P is broadcast rather than banded.

On established stands, P should be broadcast in the fall.



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If OSU soil test for P reads (ppm)	Apply this amount of phosphate (P_2O_5)-lbs/A
0 - 10	40 - 60
10 - 15	30 - 40
Over 15	None in southwest Oregon None

POTASSIUM (K)

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

On new seedings, when the OSU soil test for K is below 100 ppm, band 20 lbs potash/A 1 to 2 inches below the seed. At least 1 inch of soil should separate the seed and fertilizer. K can be banded with N and P. N plus potash in the band should not exceed 100 lbs/A. The K application rate should be increased by 50% where K is broadcast.

On established stands, K should be broadcast in the fall.

If the OSU soil test for K reads (ppm):	Apply this amount of potash (K_2O)-lbs/A
0 to 100	60
over 100	none

SULFUR (S)

Plants absorb S in the form of sulfate. Fertilizer materials supply S in the form of sulfate and elemental S. Elemental S must convert to sulfate in the soil before the S becomes available to plants. The conversion of elemental S to sulfate is usually rapid for fine ground (less than 40 mesh) material in warm moist soil. The S requirements of grass pasture can be provided by:

1. The annual application of 10-15 lbs S/A in the form of sulfate or as fine ground (finer than 40 mesh) elemental S. Elemental S will not be available to plants until the soil warms up.
2. Applying 30-40 lbs S/A as sulfate or fine ground elemental S every second year.
3. Applying coarser-ground elemental S at higher rates and less frequently.

Elemental S has an acidifying effect on the soil.

Responses to S fertilization may not occur for a period of at least 4 to 5 years on "red hill" soils which have a history of high S fertilization. These soils have a comparatively high ability to adsorb S and frequently have a history of high S fertilization through the use of a S-containing fertilizer such as ammonium sulfate.

OTHER NUTRIENTS

Responses of grass pasture to nutrients other than those discussed in this guide have not been observed in western Oregon.

LIME

Grass pasture has a moderately high tolerance to soil acidity. A lime application is suggested if the soil pH is below 5.4 or the calcium (Ca) soil test is below 3.0 meq Ca/100 grams of soil.

If the OSU SMP Buffer test for lime reads:	Apply this amount of lime (T/A):
below 5.3	3-4
5.3-5.6	2-3
5.6-5.9	1-2
over 5.9	0

The liming rate is based on 100 score lime. Lime reacts slowly in the soil and should be applied well in advance of seeding and disced into the soil. A lime application is effective over several years. Broadcasting lime on established stands of perennial grasses is not as effective as mixing lime with the soil. The surface application of lime to established fields could increase the soil pH in the surface one-half inch of soil and thereby increase the possibility of N loss from ammonium-N and urea due to volatilization.

The use of N fertilizers containing ammonium or urea will tend to increase soil acidity (decrease soil pH). Elemental S also has an acidifying effect on soil. Evaluate the soil acidity problem when renovating or making new plantings. The lime application should allow for some decrease in soil pH during the life of a perennial stand of grass. For soils needing lime which are low in Mg (less than 0.5 meq Mg/100 g of soil) one ton/A of dolomite lime can be used as a Mg source. Dolomite and ground limestone have about the same ability to neutralize soil acidity. Fertilizer Guide #3, Liming Materials for Oregon, which is available from your local OSU Extension Office, provides additional information on lime.

MANURE

Manure is a good source of plant nutrients for grass. Manures contain variable amounts of all plant nutrients. All of the nutrients in manure are not completely available the first year. The following table gives the approximate average content of some nutrients in fresh manures:

Kind of Manure	Nutrient Content of Fresh Manures			
	Water	N*	P_2O_5	K_2O
Dairy	87	0.5	0.16	0.44
Beef	82	0.65	0.43	0.53
Poultry	73	0.30	1.02	0.50
Hog	84	0.45	0.27	0.40
Sheep	73	1.00	0.36	1.00
Horse	60	0.70	0.25	0.60

*About 50% of the N is available the first year.

Losses of N sometimes exceeding 50% can occur during manure storage or following application to the surface of soil. N loss is least when fresh manure is spread and worked into the soil immediately. Manure can contain viable weed seeds.

The P, K, and lime suggestions are based on soil test values from the Soil Testing Laboratory, OSU, Corvallis, Oregon.

This guide to fertilization is based on fertilizer experiments conducted on grass pasture and grass seed crops in western Oregon by T. L. Jackson, and John Yungen, Oregon Agricultural Experiment Station and Lynn Cannon, Gale Gingrich, Gary Schneider, and E. Hugh Gardner, OSU Extension Service.

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