Fine Fescue Seed

(Western Oregon—West of Cascades)

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Three types of fine fescue—Chewings, red, and hard—are typically grown for turf seed on Jory or Nekia soils in the foothills of the Willamette Valley. Recommendations in this guide assume production in this setting and are based on research from large and small plots throughout the area. During the past 40 years, research conducted by Oregon State University on fine fescue seed production has addressed lime application, nutrient or fertilizer application, and straw management practices.

From seedbed preparation to harvest, management practices must be performed in an appropriate and timely manner for optimum seed yields. For example, rust, slugs, sod webworms, and rattail fescue require control. Fertilizer is not a substitute for failure to control insects, diseases, or weeds. Increasing fertilizer rates or adding already adequately supplied nutrients doesn't overcome losses caused by mismanagement.

Soil sampling is necessary to adequately estimate fine fescue nutritional needs. A soil test for pH, P, K, Ca, Mg, B, and lime requirements (SMP buffer) is recommended prior to planting and once every 3 or 4 years thereafter. You can use P and K soil test results to assess the need for fertilizer applications over a 3-year period. Each soil sample should represent only one soil type and management practice. For more information, a soil test interpretation guide and laboratory directory are available (see "For more information").

Nitrogen (N)

Compared to perennial ryegrass, fine fescue requires a relatively small amount of nitrogen to produce optimum seed yield. Grass plants obtain nitrogen from soil and fertilizer applications. Soils such as Jory and Nekia supply 25 to 50 lb N/a annually. Research on farms from 1999–2002 demonstrated that spring applications of 30 to 70 lb N/a produced top fine fescue seed yields.

New seedings

Apply 0 to 30 pounds of nitrogen at planting. Fine fescue fields typically are planted in the spring. Soil moisture and summer weather conditions influence stand establishment. When higher nitrogen fertilizer rates are banded at planting, and dry soil conditions are prolonged, seedling stands may suffer losses. Conversely, with ideal moisture conditions, high nitrogen fertilizer rates banded at planting can result in excessive vegetative growth for some species, such as creeping red fescue. Limit the combination of nitrogen and potassium to 75 lb/a if fertilizer is banded.

Established stands

Fall applications

Nitrogen in the soil should be adequate for fall growth. If you wish to stimulate fall growth, apply 15 to 30 lb N/a in October. If phosphorus and potassium are needed, they can be applied with the nitrogen.

Spring applications

Apply a single application of 30 to 70 lb N/a between mid-February and late March. Split or multiple applications of nitrogen are not necessary. Additional nitrogen application increases straw production without increasing seed yield. In fact, overuse of nitrogen can reduce seed yield by approximately 100 lb/a. Increasing the spring application from 70 to 140 lb/a increased crop residue by 30 percent. Burning the additional crop residue can produce high temperatures that damage fine fescue plants, cause thin stands, and shorten stand life.

Avoid applying nitrogen to excessively wet soil. Applying nitrogen to fine fescue plants showing chlorosis as a result of saturated soil will not help "green up" the yellow plants.

Phosphorus (P)

Fine fescue requires more phosphorus than other grasses grown for seed in the Willamette Valley. Use a soil test to estimate available phosphorus, and then choose an application rate from Table 1. The use of phosphorus at planting is more likely to increase seed yield than is application after a stand's establishment. If soil tests show P is less than 30 ppm, apply 30 lb P_2O_5/a at planting. Phosphorus can be applied in spring or fall once the stand is established.

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Table 1.—Phosphorus application rates.

If soil test for P is (ppm)	Apply this amount of P_2O_5 (lb/a)	
	New seeding	Established stand
0–15	40–60	40–60
15–25	30–40	30–40
25–30	30	0
Over 30	0	0

Potassium (K)

Cool-season perennial grass crops use about the same amount of potassium as nitrogen. Unlike nitrogen, most of the potassium from straw is available for next season's plant use when straw is burned. Baling straw removes 10 to 20 times the amount of K that seed harvests remove. Baling straw can rapidly deplete soil potassium. Use a soil test to estimate available potassium, and then choose an application rate from Table 2. Potassium can be applied in the fall or spring. When potassium is applied at planting, do not exceed 25 lb K_2O/a if placed with the seed.

Table 2.—Potassium application rates.

If soil test for K is (ppm)	Apply this amount of K_2O (lb/a)	
	New seeding	Established stand
0–100	25 *	60–100
100–150	0-25	0–60
Over 150	0	0

*In addition to banding 25 lb K_2O/a at seeding, broadcast an additional 75 to 100 lb K_2O/a.

Sulfur (S)

Fine fescue requires an annual application of 10 to 15 lb S/a. Apply sulfur in the spring or fall. Often, other nutrients supply sulfur, as it is a common component of fertilizers such as 16-16-16, 16-20-0, and ammonium sulfate. Plants take sulfur from the soil in the form of sulfate. The application of sulfur in the sulfate form does not increase soil acidity or the need for lime.

Micronutrients (B, Cu, Cl, Fe, Mo, Mn, and Zn)

Western Oregon soils usually supply sufficient amounts of micronutrients for optimum seed yield of cool-season grasses. Boron (B) levels normally are very low in the Willamette Valley. Although B application to other crops often increases B tissue levels and yields, increases in seed yield from boron application to grass seed crops is lincon-sistent. A single application of 1 lb B/a will increase tissue B levels for several years. Increasing seed yield of fine fescue from application of other micronutrients has not been documented in Oregon.

Lime and soil pH

The use of lime to raise the soil pH is recommended when levels are below 5.5. Appropriate soil pH is necessary for adequate root development and nutrient uptake. Proper soil pH is critical during stand establishment. Stand failure can occur if soil pH is below 5.0. Liming Nekia soil with a 5.1 pH increased seed yield more than 20 percent for the first harvest. Lime application in subsequent years produced only small increases in seed yield.

Incorporate lime several weeks before planting. Lime applications greater than 3 t/a should be thoroughly mixed with soil. A single lime application should not exceed 5 t/a even if the SMP lime requirement table suggests greater additions. When the lime requirement exceeds 5 t/a, first test the soil for pH and SMP, and then apply additional lime accordingly before planting the next crop.

Since lime moves slowly into the soil, surface application of lime without incorporation elevates soil pH only in the top inch or two of soil. Top-dressed or surface lime applications require at least a year to change soil pH sufficiently for grass crops to benefit. A single surface lime application should be limited to 1 to 2 t lime/a.

Soil pH measurements indicate whether lime is necessary. The amount of lime required to increase soil pH is estimated with the SMP lime requirement test (see Table 3). SMP normally is less than 0.8 units higher than soil pH. Some soil test results may have a high SMP (greater than 6.2) and soil pH below 5.3. This condition is typical when soil samples are taken in August and September. Spring fertilizer application and very dry summer conditions combine to temporarily depress soil pH in the late summer and fall. Soil pH increases as soil is wetted with fall and winter rains. Soil pH is highest during the wettest time of the year, usually February or March, and lowest in late summer and fall.

Table 3.—SMP lime requirement table.

If the buffer test for lime is	Amount of 100-score lime needed to raise surface 6" of soil to the following pH (t/a)	
	5.6	6.0
4.8–5.0	6–5 *	8–7
5.1–5.3	5–4	7–6
5.4–5.6	4–3	6–4
5.7–5.9	3–2	4–3
6.0–6.2	2–1	3–2
6.3–6.5	0	2–1
6.6	0	1

*The higher lime application is required for the lower buffer test reading.

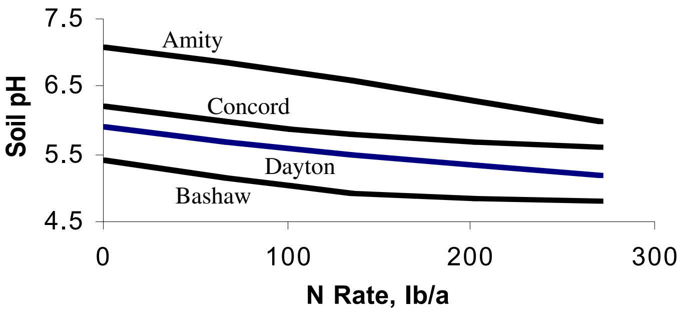

Figure 1.—Decline in soil pH from addition of 0, 135, or 270 lb N/a annually for 3 years on Amity silt loam (top line), Concord silt loam (second line from top), Dayton silt loam (third line from top), and Bashaw silty clay loam (bottom line). These soils are not soils where fine fescue typically is grown. Nekia and Jory soils where fine fescue production occurs would be expected to have a similar decline in soil pH.

Liming rates in Table 3 are based on the use of 100-score lime. The combination of calcium carbonate equivalent, moisture, and fineness determines lime score. The lime application rate is adjusted by score. Lime score is legally required for all materials marketed as "liming materials" in Oregon. For more information about lime score and liming materials, see *Fertilizer and Lime Materials Fertilizer Guide* (FG 52).

Most common nitrogen fertilizers increase soil acidity and the need for lime. Urea or other ammoniacal N sources acidify soil approximately 0.1 pH unit/100 lb N/a per year (Figure 1). Using nitrogen fertilizer beyond crop requirements of 40 to 90 lb/a has serious repercussions without any benefits. The additional nutrient expense and cost incurred from the purchase of lime without increased seed yield proves unprofitable. Also, the additional nitrogen acidifies soil and consequently requires more lime to raise the soil pH. The increased straw production from N can shorten stand life by causing a hotter burn. Finally, excess nitrogen can contaminate groundwater.

Calcium (Ca) and Magnesium (Mg)

Calcium and magnesium are essential plant nutrients that usually exist in adequate quantities for fine fescue seed production when soil pH is above 5.5. For acidic soil with less than 0.5 meq/100 g soil or 60 ppm magnesium, apply 1 t dolomite/a. Dolomite and limestone have approximately the same capability to neutralize soil acidity and increase soil pH. An alternative to dolomite is to broadcast 30 lb Mg/a. The form or timing for Mg applications is not critical.

For more information

OSU Extension publications

Fertilizer and Lime Materials Fertilizer Guide, FG 52 (revised 1990).

A List of Analytical Laboratories Serving Oregon, EM 8677 (revised 2002).

Soil Sampling for Home Gardens and Small Acreages, EC 628 (revised 2002).

Soil Test Interpretation Guide, EC 1478 (1996).

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Other publications

Young, W.C., III, G.A. Gingrich, T.B. Silberstein, S.M. Griffith, T.G. Chastain, and J.M. Hart. 2000. Defining optimum nitrogen fertilization practices for fine fescue seed production systems in the Willamette Valley. In: W.C. Young, III (ed.). *1999 Seed Production Research at Oregon State University, USDA–ARS Cooperating*, Department of Crop and Soil Science Ext/CrS 112 (Corvallis, OR, April 2000).

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Young, W.C., III, M.E. Mellbye, G.A. Gingrich, T.B. Silberstein, T.G. Chastain, and J.M. Hart. 2002. Defining optimum nitrogen fertilization practices for fine fescue and annual ryegrass seed production systems in the Willamette Valley. In: W.C. Young, III (ed.). *2001 Seed Production Research at Oregon State University, USDA–ARS Cooperating*, Department of Crop and Soil Science Ext/CrS 121 (Corvallis, OR, April 2002).

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