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FERTILIZER RECOMMENDATIONS FOR ORCHARD COVER CROPS AND SODS

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The following recommendations are directed to grass cover crops and sods, not legumes. Grasses are preferred in orchards. They are more capable of withstanding vehicle and equipment traffic, overcoming soil compaction and preventing soil erosion than legumes. Further, legumes make it difficult to control nitrogen levels and growth of the trees.

The primary difference between fertilizer recommendations for cover crops and sods is the time of application. Unless otherwise noted, it is assumed that cover crops will be fertilized at the time they are seeded. Sodds may be fertilized at any time during the year but preferably in the fall, winter or early spring. Soil moisture and precipitation is highest during this period of the year. This aids the grass to obtain needed nutrients before it begins growth in the spring.

A soil test every three years is suggested to help maintain adequate fertility levels.

Nitrogen

The requirements for nitrogen application are best determined by the growth of the grasses. Soil tests for nitrogen are not well correlated with the growth of the cover crop or sod. Cover crops and sods should grow vigorously. Vigorous grasses develop into a more continuous mat or stand, develop better root systems and are more capable of withstanding vehicle and equipment traffic, and of preventing soil erosion.

Application Rate: In general grasses can utilize between 50 and 150 pounds of nitrogen (N) per acre per year. Cover crops should be fertilized with small amounts of nitrogen at the time of seeding (40 lbs N per acre). Additional nitrogen, up to 50 lbs N per acre, can be applied when the cover has grown to 6 inches or more.

Form of Nitrogen: Grasses respond to any form of nitrogen fertilizer.

Time of Application: As noted above, cover crops should be fertilized with small amounts of nitrogen (40 lbs N per acre) at the time of seeding. Additional nitrogen can be applied when the cover crop has grown to 6 inches in height.

Nitrogen can be applied at any time from the late fall, after trees have become dormant, until mid-spring. Caution: Nitrogen fertilizer applied to the cover crop or sod may stimulate the trees into additional growth. Do not apply nitrogen to the cover crop or sod from

about mid-June until after the trees have gone into dormancy in the fall. If nitrogen is applied to aid the growth of newly planted seed, the rate should be very low.

Phosphorus

Cover crops and sods respond to phosphorus applications. A soil test for phosphorus is well correlated with their growth.

Rate of Application: For central and eastern Washington the rate of application should be:

If your WSU Bicarbonate Soil Test for P reads between	Apply this amount (lbs/acre)	
	P	or P ₂ O ₅
0 and 5	90	(204)
5 and 10	50	(114)
10 and 15	30	(69)
over 15	0	(0)

White Salmon-Underwood area:

If your WSU Acetate Soil Test for P reads between	Apply this amount (lbs/acre)	
	P	or P ₂ O ₅
0 and 5	40	(90)
5 and 10	26	(60)
10 and 15	20	(45)
over 15	0	(0)

Form of Phosphorus: Any of the commonly used sources of phosphorus may be used.

Time of Application: Broadcast and turn under before seeding. On established stands broadcast on the surface any time during the year, preferably when winter snow and rains help move fertilizer down through the cover to the soil.

Potassium

Some grasses, particularly the fescues, feed heavily on potassium. A soil test is a good index of the availability of potassium in the soil.

Rate of Application: Where soil tests have been made, apply potassium fertilizer as follows:

If the WSU Soil Test Report reads between	Apply this amount (lbs/acre)	
	K	or K ₂ O
0 and 100	200	(240)
100 and 200	100	(120)
over 200	0	(0)

Form of Potassium: Any of the commonly used sources of potassium may be used.

Time of Application: Broadcast and turn under before seeding. On established stands broadcast on the surface any time during the year, preferably when winter rains and snow move fertilizer down through the cover.

Lime (Calcium)

White Salmon-Underwood Areas: The best basis for determining lime (calcium) needs for these areas in Skamania and Klickitat Counties is the Base Saturation Soil Test. Applications of lime in accordance with needs have improved the stand and growth of cover crops in this area.

Rate of Application: In the White Salmon-Underwood Area use the Base Exchange Capacity test as follows:

<u>If the percent base saturation is in the range listed below</u> %Base Saturation	<u>Apply the following tons of lime per acre on soils with these cation exchange capacities</u>				
	<u>5-10</u>	<u>11-15</u>	<u>16-20</u>	<u>21-25</u>	<u>26-30</u>
	Tons of lime/A				
0 - 5	1.0	1.5	2.0	2.5	3.0
6 - 10	1.0	1.0	1.5	2.0	2.5
11 - 15	.5	.5	.5	1.5	2.0
16 - 20	.5	.5	.5	1.0	1.5
21 - 25	.5	.5	.5	1.0	1.0
26 and above	0.0	0.0	0.0	0.0	0.0

No lime needs to be applied if the base saturation is over 25 percent. The finer the lime is ground, the more quickly it takes effect. Lime should be ground fine enough so that 90 percent will pass through a U.S. Standard No. 100 sieve. Lime should be worked into the top 4 to 6 inches of soil as far ahead of planting the cover crop as possible.

If a soil test has not been made, it is suggested 1000 lbs per acre of lime be broadcast and turned under before seeding the cover crop.

Form of Lime: Any finely ground lime is satisfactory. The more finely ground the lime, the active it is and the more rapidly the soil acidity (pH) is likely to change. Lime high in magnesium (dolomitic lime) is preferred.

Time of Application: Lime is more effective when broadcast and plowed under before planting. On established stands, broadcast on the surface any time during the year.

Central and Eastern Washington: See Acidity (pH) below.

Acidity (pH)

Grasses tolerate a wide range of soil acidity (pH). Soils of a low pH, below pH 5.5, indicate availability of manganese may be excessive. Manganese can be very toxic to fruit trees, particularly apples.

White Salmon-Underwood areas: Acidity (pH) will be properly corrected in these areas when lime is applied according to the base saturation test as described above (see Lime 'Calcium').

Central and Eastern Washington: Orchard soils in these areas which have pH values below 5.5 should be limed to about pH 6.5.

Soils which are alkaline, above pH 8.0 should be checked for their source of alkalinity (see E.M. 3058, "Interpretation of Special Orchard Soil Tests").

Rate of Application: The rate of application of limestone will vary depending upon the lime requirement of the soil. In general, most sandy loam soils will require about 2 tons of lime per acre to raise the pH from pH 5.5 to pH 6.5. Heavier soils or more acid soils may require more lime.

Form of Lime: Any finely ground lime is satisfactory. The more finely ground the lime, the more active it is and the more rapidly the soil acidity (pH) is likely to change. Lime high in magnesium (dolomite) is preferred.

Time of Application: Lime is more effective when broadcast and plowed under before planting. On established stands, broadcast on the surface any time during the year.

Magnesium

Orchard cover crops and sods have not responded to applications of magnesium. Broadcast applications of magnesium are intended to benefit the tree, not the grass (see FR 28a, Fertilizer Recommendation for Fruit Trees, for further explanation).

Manganese

Grass cover crops or sods have not been shown to respond to application of manganese in Washington.

Boron

Grass cover crops or sods have not been shown to respond to application of boron in Washington.

Sulfur

Areas irrigated from the Roza Canal in the Yakima Valley, the Wenatchee River, or the Stemilt Basin may be deficient in sulfur. In these areas, heavily fertilized, newly established grass, can subject young trees to sulfur deficiency.

Rate of Application: Sulfur at 30 pounds per acre is sufficient.

Form of Sulfur: Any form of sulfur can be used including sulfur containing fertilizers.

Time of Application: Apply at any time of the year when symptoms become apparent.

Zinc

Zinc deficiency may occur in rare instances in newly established cover crops or sods. If the soil test for zinc is below 0.8 ppm, applications of zinc may be beneficial.

Rate of Application: 10 lbs of actual zinc per acre.

Form of Zinc: Any readily available form of zinc is satisfactory.
(Example: zinc sulfate)

Time of Application: Apply as a broadcast treatment and incorporate zinc into the soil before seeding.

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