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COOPERATIVE EXTENSION SERVICE — OREGON STATE UNIVERSITY — Oregon Counties and the U. S. Department of Agriculture Cooperating

# Oregon State University Fertilizer Guide for

FG 26
Revised September 1976

# PEARS

## (Oregon - Except Hood River)

Observations of annual shoot growth and size and color of leaves and fruit are helpful to an orchardist in determining the fertilizer needs of his trees. In addition, *leaf analysis* indicates which elements are present in adequate, deficient, or excessive amounts. Soil analysis before planting is useful in predicting the need for potassium, magnesium, or lime applications.

A nutrient deficiency should be suspected if the cause of poor tree performance is not primarily one or more of the following:

| | | |
|---|---|---|
| *lack of pruning* | *poor pollination* | *disease* |
| *winter injury* | *deep cultivation* | *insects* |
| *physical injury* | *soil borne pests* | *rodents* |
| *poor weather* | *poor soil drainage* | |
| *shallow soil* | *limited moisture* | |

### NITROGEN (N)

Young trees (dwarf or standard)

| Age | Apply this amount of N (lb/tree) |
|---|---|
| planting - 2 yrs | none |
| 3 - 5 | 1/3 - 1/3 |
| 6 - 7 | 1/3 - 1/2 |
| 8 - 10 | 1/2 - 3/4 |

Mature trees (standard)

Leaf analysis guide for N requirement

% N in Leaf in August

| | Variety | | |
|---|---|---|---|
| N status | Bartlett | Anjou | All other |
| Shortage | 1.9 | below 1.5 | 1.7 |
| Below norm. | 1.9-2.2 | 1.5-2.2 | 1.7-2.4 |
| Normal | 2.6-2.8 | 2.2-2.4 | 2.4-2.6 |
| Above norm. | over 2.8 | over 2.4 | 2.6 |

| | Apply this amount N per tree (lbs)[1] | | |
|---|---|---|---|
| N status | Bartlett | Anjou, Comice | Bosc |
| Shortage | 4 | 5 | 6 |
| Below norm. | 3 | 4 | 5 |
| Normal | 1 1/2 | 3 | 4 |
| Above norm. | 1/2 | 1 | 1 1/2 |

[1]N rate based on 70 trees/A.

These suggested N rates are for clean cultivation. *Where sod is used,* N rates should be increased by about 40 lbs/A.

Past experience is often the best guide to adjustment in the rate of N application.

For *mature orchards* with over 150 trees/A use the same fertilizer per acre as for standard orchards and adjust according to growth and leaf analysis.

Apply N in a 2 foot band under drip line or increase 20-30% for a broadcast application.

N applications should be made during the period between leaf fall in the autumn and at least a month before bloom.

Do not apply N until after all leaves have fallen. Early fall application could increase danger of winter freeze damage, especially in Hood River County.

Most N fertilizers, especially ammonium sulfate, increase soil acidity.

Pear trees over 15 years old should make 8-10 inches of new growth each year.

### PHOSPHORUS (P) AND SULFUR (S)

Deficiencies of P and S have not been observed in Oregon pear orchards.

### POTASSIUM (K)

Leaf analysis guide for K application

| % leaf K in August | Apply this amount (lbs/tree) $K_2O$ | K |
|---|---|---|
| Under 0.7 | (shortage) 10-15 | 8-12 |
| Over 0.7 | (optimum) none | |

The K content of fertilizer is expressed as the oxide ($K_2O$) on fertilizer labels. Multiply $K_2O$ by 0.83 to convert to K.

Place K in concentrated band on soil surface.

Submit soil sample from 0-6 inch depth for lime requirement test and lime to pH 5.6 in band where K is applied.

If pH is above 5.6, band gypsum instead of lime.

Use only $K_2SO_4$ in low rainfall areas - KCl can give chloride toxicity.

### MAGNESIUM (Mg)

Leaf analysis guide for Mg application

| % leaf Mg in August | |
|---|---|
| Under 0.18 | shortage |
| 0.18- 0.24 | below normal |
| Over 0.24 | normal |



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Where Mg is needed, broadcast 1 T/A of dolomite. Dolomite equals ground limestone in reducing soil acidity.

## BORON (B)

Leaf analysis guide for B applications

| ppm B in leaves | | Apply this amount B (lb/tree) |
|---|---|---|
| Under 20 | shortage | 0.2 - 0.3 |
| 20-30 | below normal | 0.2 |
| 30-80 | normal | 0.2* |
| Over 80 | above normal | none |

*Maintenance application every 3 years.

Do not apply B to non-bearing trees. Reduce rates per tree by one-half or more for young bearing trees since *trees are easily injured by excessive B applications. B should be broadcast when applied to soil.*

If B deficiency has occurred, spray application may give more rapid recovery than soil application. One preventive spray per year has been as effective as periodic soil applications.

Spray at rate of 8 lb sodium pentaborate/A using 2 lb sodium pentaborate/100 gal of water. Spray twice if deficiency has occurred; fall application (before leaves drop) plus prebloom application (3-4 days before blossoms open); or prebloom application plus first cover spray.

## ZINC (Zn)

Deficiency symptoms are the most reliable indication of need for Zn. If several elements are deficient, symptoms may not be clearly recognized. Symptoms occur early in top of trees primarily. Shoots have a tuft or rosette of comparatively larger leaves at the tip with smaller, narrow, sometimes chlorotic leaves below.

If leaf Zn levels in August are below 17 ppm, a deficiency is suspected. *Soil applications will not correct Zn deficiency.*

### Application of Zn

*Dormant sprays:* Apply Zn sulfate at rate of 15 lb Zn (45 lb of 32% Zn sulfate crystals or 13 gal liquid Zn sulfate)/A. The dormant application should be made as late as possible in dormant season before any visible green appears. (Caution: Be sure all crystals have dissolved before spraying.)

*After harvest sprays:* Apply Zn sulfate spray, using approximately 1/2 lb Zn (1 1/2 lb 32% crystals or 1/2 gal liquid)/100 gal of spray to non-bearing trees as soon as deficiency is recognized. Foliage should be thoroughly wetted.

A spray of Zn chelate at 2-3 lbs/100 gal 10-14 days following petal fall may be substituted for dormant Zn sulfate spray. In severe cases, a second spray may be required.

## OTHER MICRONUTRIENTS

Deficiencies of other micronutrients have not been observed in Oregon pear orchards.

## NEW ORCHARDS

Soil sampling and testing of fields to be planted to orchards is recommended. Application and incorporation into soil of certain nutrient elements such as K and Mg and lime can best done prior to planting.

## POTASSIUM (K)

K should be broadcast and plowed under during preparation of land for planting.

| If the OSU soil test for K reads (ppm) | Apply this amount (lb/A) $K_2O$ | K |
|---|---|---|
| 0 to 75 | 300-400 | 250-330 |
| 75 to 150 | 200-300 | 165-250 |
| over 150 | none | none |

## MAGNESIUM (Mg)

If the OSU soil test for Mg is less than 0.5 me/100g of soil, apply 1.5 T/A of dolomite.

Dolomite equals ground limestone in the correction of soil acidity. Apply dolomite in a similar manner to lime.

## LIME

Liming of orchard soils is most effective where the lime is mixed into the soil to as great a depth as feasible during the preparation of the land for planting. Use lime requirement test to lime to pH 5.6.

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K, Mg, and lime recommendations for new orchards are based on soil test values from the Soil Testing Laboratory, OSU, Corvallis, Oregon.

These recommendations are based on research findings in many states and observations of responses in commercial orchards in Oregon, including leaf analysis.

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