# 2010
# Maine Orchard Nutrient Recommendation Guidelines

## Ground Applications

### NITROGEN

Sandy loam textured soils in the Northeast supply 40 - 60 pounds of nitrogen per acre per year from the normal turnover of organic matter. Given this background supply of nitrogen, the recommended base rate of nitrogen fertilizer addition is determined by tree size:

Seedling rootstock (< 100 trees/A) – 30 lb N/A

Large semi-dwarf apple and all peaches (100 – 200 trees/A) – 25 lb N/A

Small semi-dwarf apple and all pears, plums and cherries (200 – 300 trees/A) - 20 lb N/A

Full dwarf trees (300 – 600 trees/A) – 15 lb N/A

Young, non-bearing trees (all sizes) – 50 lb N/A

Add 5 to 10 lbs. to the rates listed above for sandy soils. Subtract 5 to 10 lbs. for loamy soils.

<u>Adjustments to base application rates</u>

1) Red Delicious (heavy crop load), all Young non-bearing trees

foliar N < 2.4 %: Increase N application rate 10% over base rate for each 0.1 % below 2.4%.

foliar N = 2.4 - 2.6 %: Maintain same N application rate as last year, not to exceed base rate.

foliar N > 2.6 %: Apply no N next year.

2) Red Delicious (normal crop load), all other bearing trees (heavy crop load)

foliar N < 2.2 %: Increase N application rate 10% over base rate for each 0.1 % below 2.2%.

foliar N = 2.2 - 2.4 %: Maintain same N application rate as last year, not to exceed base rate.

foliar N > 2.4 %: Apply no N next year.

3) Red Delicious (light crop load), all other bearing trees (normal crop load)

foliar N < 2.0 %: Increase N application rate 10% over base rate for each 0.1 % below 2.0%.

foliar N = 2.0 - 2.2 %: Maintain same N application rate as last year, not to exceed base rate.

foliar N > 2.2 %: Apply no N next year.

4) All bearing trees except Red Delicious (light crop load)

foliar N < 1.9 %: Increase N application rate 10% over base rate for each 0.1 % below 1.9%.

foliar N = 1.9 - 2.1 %: Maintain same N application rate as last year, not to exceed base rate.

foliar N > 2.1 %: Apply no N next year.

5) Peaches

foliar N < 3.0 %: Increase N application rate 10% over base rate for each 0.1 % below 3.0%.

foliar N = 3.0 – 4.0 %: Maintain same N application rate as last year, not to exceed base rate.

foliar N > 4.0 %: Apply no N next year.

Additional adjustments

1) If there was poor fruit color this year, apply no nitrogen next year.

2) For all bearing trees: if shoot growth > 18 in., apply no N next year.

3) If foliar N < 1.8 % ("deficient"), then disregard adjustments 1 & 2.

4) Maximum N application rates:
- 2 pounds N/tree
- 120 pounds N/acre for sod or mulch ground cover
- 100 pounds N/acre for herbicide cover

Note: all ground applied N application rates are presented on a per acre basis.

# CALCIUM

## Basic Recommendation

1) If topsoil pH is below 5.9: Apply **lime** to raise soil pH to 6.0. Lime rate is calculated from soil pH and lime index (a lime response test). Topsoil and subsoil lime requirements are averaged where both were sampled.

2) If average topsoil pH is 5.9 or higher, but soil Ca < 60 % saturation: Apply **gypsum** to raise average soil Ca level to "optimum" (75 % saturation) without raising soil pH.

## Suggested Liming Material

1) If Mg is to be ground applied (see magnesium section below): Use a magnesium lime.

2) If no Mg is to be ground applied: Use a calcitic lime.

Notes: Lime or gypsum recommendations are made on a per acre basis, rounded to the nearest 500 pounds/acre. Maximum recommended lime application in any one year is 4000 pounds/acre. If soil samples were not sent, no calcium recommendation will be made.

# POTASSIUM

## Basic Recommendation

1) If soil samples were supplied: Calculate potash application rate to raise average soil level to the optimum range (3.5 % saturation) and add 100 pounds $K_2O$/acre to cover average crop removal.

2) If no soil samples were supplied, calculate potash application rate based on foliar K level only:

| foliar K | $K_2O$ recommended* |
|---|---|
| 1.0 % | 1.3 pounds/tree |
| 1.1 % | 1.0 pounds/tree |
| 1.2 % | 0.7 pounds/tree |
| 1.3 % | 0.5 pounds/tree |
| 1.4 % | 0.2 pounds/tree |
| 1.5 % or greater | none recommended |

*Multiply lb $K_2O$ /tree x trees/acre to convert to lb $K_2O$/acre.

## Adjustments

1) If average soil K level > 5 % saturation **and** > 250 pounds K/acre, apply no potash next year.

2) If foliar K level is "optimum", but foliar N/K ratio is "low", apply no potash next year.

3) Apply no potash next year if foliar K level exceeds the following:

For young non-bearing trees (all varieties) with foliar K > 2.0 %

For Red Delicious or Golden Delicious
- If crop load was light and foliar K > 1.7 %
- If crop load was normal and foliar K > 1.6 %
- If crop load was heavy and foliar K > 1.5 %

For all other bearing trees
- If crop load was light and foliar K > 1.9 %
- If crop load was normal and foliar K > 1.8 %
- If crop load was heavy and foliar K > 1.7 %

4) If none of the above limits 1 - 3 applies or if average soil K < 250 pounds/acre, minimum application rate is 100 pounds $K_2O$/acre.

5) Maximum K application rates:
- 2.4 pounds $K_2O$/tree .
- 200 pounds $K_2O$/acre .

Note: Recommendations are presented in terms of pounds potash ($K_2O$)/acre.

## MAGNESIUM

Basic Recommendation

Calculate magnesium application rate to raise average soil level to "optimum" (20 % saturation).

Adjustments

1) Maximum application of 400 pounds Mg/acre.

2) If calculated application rate < 25 pounds Mg/acre, apply no magnesium to the ground next year.

3) If average soil Ca/Mg ratio < 5 (using % saturation values) and Mg saturation > 15 %, apply no magnesium to the ground next year.

Note: Recommendations are presented in pounds actual Mg/acre. If no soil samples were sent, no recommendation for ground-applied Mg will be made.

## BORON

Basic Recommendation

1) If foliar boron < 30 ppm ("deficient"), apply up to 3 pounds actual B/acre in fertilizer blend.

2) If foliar boron < 35 ppm ("low"), apply up to 2 pounds actual B/acre in fertilizer blend.

Note: Total boron application (ground and foliar applied) is not to exceed 6 pounds actual B/acre. Heavier application may result in boron toxicity.

# Maine Orchard Nutrient Recommendation Guidelines

## Foliar Applications

### NITROGEN

For all ages and varieties, with foliar N < 1.8 % ("deficient")

Apply two sprays of urea: at pink and at petal fall. Application rate is 10 pounds urea/acre at both covers.

### CALCIUM

For ALL bearing trees with Ca < 1.3 % (low) and for all trees with foliar Ca < 0.75 % ("deficient")

Apply calcium chloride sprays at second and later covers. Application rate is 6 pounds calcium chloride/acre at each cover for a total of about 40 pounds for the year.

An alternative and/or supplement to foliar calcium sprays is to dip fruit in a calcium chloride solution at harvest.

### MAGNESIUM

For all ages and varieties, with foliar Mg < 0.25 % ("deficient")

Apply three sprays of epsom salt: at petal fall, first, and second covers. Application rate is 45 pounds epsom salt/acre at each cover.

### BORON

For all ages and varieties, with foliar B < 30 ppm ("deficient")

Apply two sprays of Solubor: at pink, first cover, or third cover. Application rate is 3 pounds Solubor/acre at each cover.

CAUTION: Total boron application (ground and foliar applied) should not exceed 6 pounds actual B/acre. Heavier application may result in boron toxicity.

## COPPER

For all ages and varieties, with foliar Cu < 3.5 ppm ("deficient")

Apply fixed copper (COCS) or tribasic copper sulfate at or before green-tip. Application rate is 6 pounds COCS or copper sulfate/acre.

CAUTION: later application will cause foliar toxicity.

## MANGANESE

For all ages and varieties: If a manganese fungicide WAS used and foliar Mn < 35 ppm ("deficient") **or** if manganese fungicide was NOT used and foliar Mn < 25 ppm ("deficient")

Use a manganese-containing fungicide at the label-recommended rate **OR** apply one spray of manganese sulfate at first cover only. Application rate is 12 pounds manganese sulfate/acre.

## ZINC

For all ages and varieties: If foliar Zn < 15 ppm **or** if zinc WAS sprayed this year and foliar P/Zn ratio > 100 **or** if zinc was NOT sprayed this year and foliar P/Zn ratio > 150 (all labeled as "deficient" zinc)

Apply three sprays of zinc chelate: at tight cluster, first cover, and third cover. Application rate is 3 pounds zinc chelate/acre.