

CHECKLIST
FIELD NURSERIES—NUTRIENT MANAGEMENT

- ✓ Test soils each year (midsummer to fall) to determine fertilizer needs for fields the following year. Have soil tested to indicate if other soil nutrients are required as pre-plant adjustments.
- ✓ Incorporate nitrogen (N) fertilizer during field preparation based on soil test. Use soil test results to add other soil nutrients as required prior to planting.
- ✓ After the first year, surface application of N is based on an amount of N per plant rather than pounds of N per acre. Place fertilizer within the root zone as a side dress at the rate of 0.25 to 0.5 ounce of N per plant.
- ✓ If supplemental fertilizer is required the first year for fall-transplanted plants, each plant should receive 0.25 to 0.5 ounce of N before bud break. During the second year, each plant should receive 0.5 to 1.0 ounce distributed in split applications: the first two-thirds of the total amount should be applied before bud break, and the second application should be made by mid-June. During the third and following years, each plant should receive 1.0 to 2.0 ounces in split applications as described for the second year.
- ✓ Slower-growing cultivars or species should be fertilized at the lower application rates, whereas vigorous plants will have increased growth if the higher application rate is used.

FIELD NURSERIES

Nutrient Management

Best Management Practices (BMPs) for fertilizer applications focus on water quality and nutrient runoff as well as maximizing growth of nursery stock. Nutrient management should be a balance between optimizing plant growth and avoiding excess application of nutrients. Excess nutrients can be lost in the environment and become environmental pollutants. The two nutrient elements of most concern are phosphorus (P) and nitrogen (N). Phosphorus attaches to the cation exchange sites in the soil and can be moved off-site with eroded soil particles in runoff water and cause eutrophication and algae growth in surface water (rivers, lakes, and estuary). Nitrogen is very mobile and leaches through the soils into the ground water where it is considered a contaminant in drinking water.

Nutrient management and fertilizing decisions should be based on soil tests. Soil tests should be conducted prior to each crop cycle to evaluate pH (lime requirement), phosphorus (P), potassium (K) and micronutrients requirements. Fertilize application should be made according to the crop needs as recommended by the soil test.

Lime and phosphorus amendments should be incorporated well before the growing season and thoroughly mixed with the top 6 to 8 inches of soil during normal soil preparation practices. Potassium and micronutrients should be incorporated into the soil during cultivation before planting. Soil test results will indicate if other soil nutrients are required as pre-plant adjustments. In soils where phosphorus (P) and potash (potassium, K) tend to remain high once adequate levels are established, N may be the only required yearly addition. Currently, ammonium nitrate (33-0-0) and urea (46-0-0) are the most popular soluble fertilizers. Split nitrogen applications promote efficient use uptake of fertilizer and limits losses to the environment. Where yearly P application is also warranted, di-ammonium phosphate (18-46-0) has often been used as an N and P source. Although a combination or complete (N,P, K) fertilizer is less expensive than applying straight (nutrient specific) fertilizers, if one of nutrient element is not needed or is needed in less amounts, potential negative environmental impacts may be greater. Apply specific nutrient fertilizers such as triple super phosphate (0-46-0), muriate of potash (0-0-60), potassium sulfate (0-0-50) as recommended by a soil test.



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Certain recommended fertilizer practices for field nurseries have been adopted in other states to reduce runoff while meeting the fertility needs of plants. For example, during field preparation, the practice of incorporating fertilizer at 50 pounds of N per acre reduces runoff potential and usually meets the N requirements of new plants during the first year. Other nutrients as recommended by soil tests should be incorporated before planting. In

subsequent years, surface application of N is based on an amount of N per plant rather than pounds of N per acre. It is suggested that fertilizer be placed within the root zone as a side dress at the rate of 0.25 to 0.5 ounce of N per plant rather than applying previous recommendations of 100 to 200 pounds of N per acre. Doing so maximizes growth with a minimum amount of fertilizer. If supplemental fertilizer is required the first year for fall-transplanted plants, each plant should receive 0.25 to 0.5 ounce of N before bud break. During the second year, each plant should receive 0.5 to 1.0 ounce distributed in split applications: the first two-thirds of the total amount should be applied before bud break, and the second application should be made by mid-June. During the third and following years, each plant should receive 1.0 to 2.0 ounces in split applications as described for the second year. Slower-growing cultivars or species should be fertilized at the lower application rates, whereas vigorous plants will have increased growth if the higher application rate is used. Higher rates can contribute to nutrient runoff and water quality impacts. Recently, slow-release fertilizers developed specifically for field use have been introduced. Although these fertilizers are more expensive, one application may last the entire growing season. Fertilizer application can also be done through irrigation (fertigation). In fertigation, fertilizers are injected into the irrigation water. It can be a good method of applying fertilizer in the nursery since it allows plants to be provided with nutrients as needed throughout the season. It can also be used effectively to quickly address nutrient deficiencies. Fertigation minimizes losses of nutrients into the environment. However care must be taken to avoid runoff during fertigation.

Base timing of fertilization on plant growth habit. For plants that have a single flush of growth, fertilize in the fall and early spring before growth begins. For plants that have multiple flushes, split recommended applications among fall, spring, and when the first flush begins to slow down.

Fall fertilization (late August through September) is effective because roots continue to absorb nutrients until soil temperatures approach freezing. N that is absorbed in fall will be stored and converted to forms used to support the spring flush of growth.

Nutritionally balanced plants have the best chance of withstanding winter conditions.

Note: N generally stimulates growth, and when applied late in the growing season (late summer) to plants that have multiple flushes of growth, it can prevent growth cessation and thus reduce the potential for cold hardiness in a woody plant. Avoid fertilizing field stock in late fall or early winter; fertilizer can easily run off frozen ground.