Tables of optimal concentrations

Although the specific nutrient requirements for all container plants are not known, ranges are given in the table for plants grown outdoors or under shade, such as woody plants. Optimal ranges are presented and these should result in desirable growth for most plants; however, plant nutrient requirements can vary according to genera and other environmental factors so some judgment based on experience is best.

TABLE 1: Container substrate nutrition for woody ornamentals grown outdoors or under shade.

ANALYSES	RATING CATEGORY				
	Low	**Acceptable**	**Optimum**	**High**	**Very High**
pH	< 5.0	5.0 to 5.5	5.5 to 5.8	5.8 to 6.5	> 6.5
Electrical conductivity, dS/m	< 0.7	0.7 to 1.0	1.0 to 1.5	1.5 to 3.0	> 3.0
Nitrate-N, mg/L (ppm)	< 40	40 to 80	80 to 100	100 to 200	> 200
Phosphorus, mg/L	< 3	3 to 8	8 to 12	l2 to 18	> 18
Potassium, mg/L	< 10	10 to 20	20 to 40	40 to 80	> 80
Calcium, mg/L	< 10	10 to 20	20 to 40	40 to 100	> 100
Magnesium, mg/L	< 10	10 to 15	15 to 20	20 to 60	>60

Plants of the Ericaceae (eg., azaleas) and salt-sensitive plants may tolerate only one half the electrical conductivity and may require only one half the levels of nutrients (nitrate nitrogen, phosphorus, potassium, calcium, and magnesium) shown in this table.

1 dS/m = 1 mmhos/cm

TABLE 2: Container substrate nutrition for bedding and interior plants grown in a greenhouse.

ANALYSES	RATING CATEGORY				
	Low	**Acceptable**	**Optimum**	**High**	**Very High**
pH	< 5.3	5.3 to 5.6	5.6 to 5.8	5.8 to 6.5	> 6.5
Electrical conductivity, dS/m	< 0.8	0.8 to 2.0	2.0 to 3.5	3.5 to 5.0	>5.00
Nitrate-N, mg/L (ppm)	< 40	40 to 100	100 to 200	200 to 300	>300
Phosphorus, mg/L	< 5	5 to 9	9 to 12	12 to 18	>18
Potassium, mg/L	< 60	60 to 150	150 to 225	225 to 300	>300
Calcium, mg/L	< 30	30 to 100	100+		
Magnesium, mg/L	< 30	30 to 70	70+		

Adapted from Michigan State Univ. Ag. Facts, Warncke, D. and D. Krauskopf. 1983. Extension Bul. E1736.

Table for compliance monitoring

Florida container plant producers participating in the nitrate nitrogen interim measure program will monitor electrical conductivity (EC) or nitrate nitrogen at least once per month for plants or a group of plants representing at least 50% of plant production. Monitoring is done to ensure nutrient concentrations in containers are not excessive. Optimal EC and nitrate nitrogen concentrations are given in the table. Maintaining these levels should result in desirable plant growth for most plants; however, plant nutrient requirements can vary according to genera and other environmental factors so some judgment based on experience is best.

TABLE 3: Container substrate electrical conductivities (EC) and nitrate nitrogen (NO_3-N) concentrations for compliance with Interim Measure for Florida Producers of Container-grown Plants.

Analysis	Woody plants[z]	Bedding and interior plants[y]
Electrical conductivity, dS/m (mmhos/cm)	0.8 to 1.5	1.5 to 2.8
Nitrate-N, mg/L (ppm)	50 to 100	100 to 200

Plants with low nutritional requirements may grow adequately with lower levels.
[z]Adapted from Best Management Practices, Guide for Producing Container-Grown Plants (Yeager, et al. 1997). [y]Adapted from Michigan State Univ. Ag. Facts, Warncke, D. and D. Krauskopf. 1983. Extension Bul. E1736.

Table for water pour-through.

Table 4: Approximate volume of water to apply to obtain 50 ml (2.0 oz) of leachate.

	WATER TO APPLY	
Container size	**milliliters**	**Ounces**
4-6 inch	75	2.5
6 ½ inch azalea	100	3.5
1 quart	75	2.5
1 gallon	150	5.0
3 gallon	350	12.0
5 gallon	550	18.5
Trays (amount per cell)	50	2.0

Containers should be at container capacity for about 30 minutes (for cavities or cells in flats and small containers) to 2 hours (for larger containers) before applying water.

The volumes of water are estimates; so actual amount may vary depending on crop, substrate, or environmental conditions. Adapted from 1, 2, 3's of PourThru, NC State University, Whipker et al. 2001).