

Citrus

The level of nitrogen fertility has more influence on the growth, yield and quality of citrus than any other single plant nutrient because it is the nutrient most often deficient in Arizona soils. Observations of annual shoot growth and size and color of leaves and fruit are helpful in determining the nitrogen needs of citrus trees. Leaf tissue analysis from mature trees can also be used to monitor the nitrogen status of an orchard. Soil analysis before orchard establishment can be useful in determining the suitability of a particular site for citrus production, as well as indicate the need for nitrogen during the first years after planting (Table 33).

• Young trees

Adequate supplies of nitrogen are needed to promote rapid growth and development of young nonbearing trees. Supplying the N needs of new orchards should be based on a soil test for NO₃-N and subsequent tree vigor.

• Mature orchards

The following are typical ranges of application for established citrus orchards over five years old:

- 1 to 2 lbs. N per mature tree
- 2 to 3 lbs. N per mature tree on very sandy soils

Use lower rates for grapefruit and the higher rates for high vigor varieties such as lemons.

Excessive applications of N can have several adverse effects, including increased rind thickness and toughness, a decreased solids:acid ratio and an increased susceptibility of new foliage to winter injury. In addition excessive foliar applied N can cause leaf burn.

Use August leaf samples to guide N applications on mature trees (over five years old). Sample 5- to

7-month-old, bloom-cycle leaves from non-fruiting terminals on healthy trees (Figure 37). Use Table 34 to guide N applications to mature citrus trees.

Table 34.
Suggested nitrogen application rates for mature citrus trees based on August leaf N concentrations.

Total N in Leaves	Apply this amount of N per tree*
%	lbs.
<2.2	3 - 4
2.2 - 2.3	2 - 3
2.4 - 2.6	1 - 2
2.7 - 2.8	1/2 - 1
>2.8	0 - 1/2

*use the higher rates for lemon trees

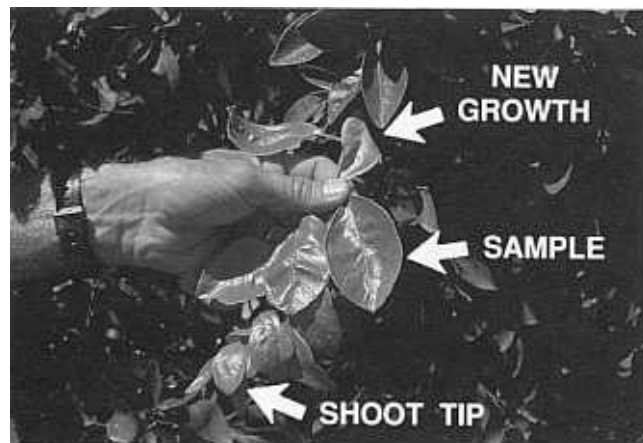


Figure 37.
Collect leaf tissue samples in August for nutrient analysis. Sample 5- to 7-month old, bloom-cycle leaves from the middle of non-fruiting terminals as shown above.

Table 33.
Suggested nitrogen fertilizer rates for citrus trees during their first five years based on preplant soil nitrate-nitrogen levels.

NO ₃ -N Soil Test	Apply This Amount of N (lbs./tree)		
	1st yr.	2nd - 3rd yr.	4th - 5th yr.
ppm			
0 - 10*	0 - 0.5	0.75	1.0
10 - 20	0.25	0 - 0.5	0.5 - 0.75
above 20	0	0.25	0.25 - 0.5

*Rates up to 1/2 lb. N on trees before the fourth year and 1 1/2 lbs. N on trees in the fourth and fifth years may be required on very sandy soils such as on the Yuma Mesa.

- **Timing of N applications**

Apply 1/2 of the required N in late winter with the remainder applied in 3 to 6 applications through mid-summer. Continue applications through August for lemons and other early maturing varieties. More frequent, lighter applications are recommended on sandy soils such as the Superstition sand, which is found on the Yuma Mesa.

- **Importance of forms of N**

Ammonium (NH_4) forms of N such as anhydrous and aqua ammonia and ammonium sulfate will become available for plant uptake with the second irrigation following application. Nitrate (NO_3) and urea forms of N are available after the first irrigation. Caution should be used when applying an-

hydrous and aqua ammonia to avoid plant injury from ammonia toxicity, especially on very sandy soils.

- **Methods of application**

Inject N into irrigation water or place dry N fertilizers in the basin around each tree and follow immediately with irrigation. The uniformity of N applied with irrigation water will only be as good as the uniformity of water application.

For foliar applications use 10 lbs. low biuret (<2%) urea per 100 gallons. Allow one month between foliar applications.

- **Nutrient removal**

A harvest of 10 to 15 tons of citrus per acre will contain about 35 to 60 lbs. N.