Cantaloupe

The level of nitrogen fertility has more influence on the growth and yield of cantaloupe than any other single plant nutrient because it is the nutrient most often deficient in Arizona soils. With good management a total of about 70 to 150 lbs. N per acre is usually needed for optimum production.

Preplant soil analysis and leaf petiole analysis during the season can be useful in monitoring the nitrogen status of the crop. Deficiencies of nitrogen at any time of the season are to be avoided, as marketable yield, melon netting and general plant vigor and appearance will usually suffer. Deficiencies after fruits are 2 to 4 inches in diameter are especially serious, as nitrogen applications after this stage may not completely correct the problem.

Fertilizer recommendations in this guide apply to all cantaloupe varieties grown in Arizona and are based on a plant population of 5000 to 7000 plants per acre and a yield potential of 20 to 30 tons per acre. Rates may need to be adjusted for significantly different plant populations or yield goals.

- **Early season nitrogen**

Preplant applications of nitrogen are not often required since early season uptake of N prior to the early runner stage is very low. If the soil test value for NO_3-N taken before planting is below 10 ppm then apply 50 lbs. N per acre. Nitrogen should be broadcast on the soil surface just prior to listing and shaping of the melon beds.

- **Mid-season nitrogen**

At the 3- to 4-leaf stage of growth, collection of leaf petioles for nitrate analysis should begin. The petiole (leaf stem) from the youngest full-sized leaves should be sampled. This is normally the third or fourth leaf from the end of a vine (Figure 31). Do not sample petioles from diseased, damaged or unrepresentative leaves. About 25 to 50 petioles per sample are adequate for analysis. The number of samples tested from each field depends on the uniformity of the field. Samples should be collected from randomly selected plants within uniform areas representing portions of a field that can be fertilized separately. Samples should be placed in paper bags and dried at about 150° F (65°C) or refrigerated as soon as possible and submitted to a laboratory for NO_3-N analysis. Petioles should be collected at the 3- to 4-leaf, early runner, 2-inch melon and full-size melon stages.

- **Interpretation of petiole nitrate levels**

The petiole nitrate level is normally high (with adequate soil fertility) early in the season during vegetative growth and declines as the season progresses. The interpretation of petiole nitrate values and corresponding midseason fertilizer applications are shown in Table 31 and Figure 32.

Petiole nitrate concentrations should be maintained above 4000 ppm NO_3-N throughout the season. Visual symptoms of N deficiency such as pale green foliage or reduced vine growth appear when the petiole nitrate concentration falls below about 2000 ppm NO_3-N. This should be avoided as some reduction in yield will probably occur even if the deficiency is corrected. No losses of yield or quality have been observed when high rates of N fertilization have resulted in excessive levels of petiole NO_3-N.

Applications of N after melons have reached full size but before harvest will be of little or no help in correcting a nitrogen deficiency late in the season. This is because N uptake falls very rapidly once melons have reached their full size. In addition, ammonium forms of N applied at this time will be adsorbed on soil particles at the point of application and will remain positionally unavailable to plant roots.

If the nitrate-N level is below 4,000 ppm NO_3-N then application of a nitrate or urea source is recommended. These forms of N move readily in soil solution and are immediately available to the plant roots with the first irrigation after the fertilizer has been applied. This decreases the time necessary for recovery from a nitrogen deficiency. At higher levels of petiole N, the nitrogen source is of less importance because nitrification of ammonium (NH_4) sources can take place rapidly enough to permit the resulting NO_3 to be moved into the root zone to supply the needs of the plants. Caution should be used when applying ammonium sources of nitrogen such as anhydrous or aqua ammonia in order to avoid plant injury from ammonia toxicity, especially on very sandy soils.

Figure 31.
Begin collecting cantaloupe petioles at the 3- to 4-leaf stage, sampling the youngest full-sized leaf. Once runners begin to form, this is usually the third or fourth leaf from the end of the vine as shown above.

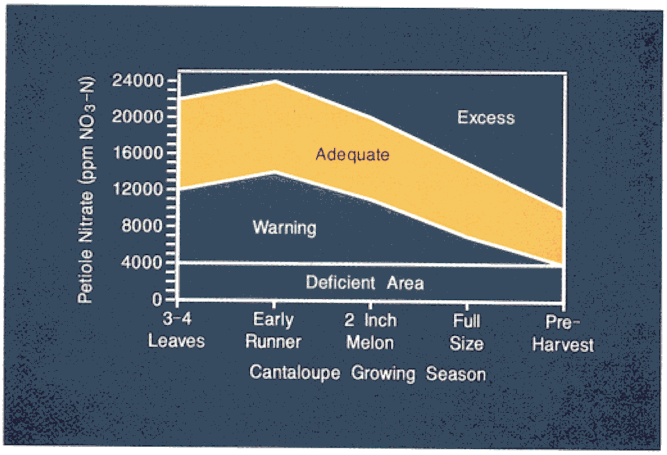

Figure 32.
Interpretation of nitrate-nitrogen in cantaloupe petioles at different stages of growth.

- **Nutrient removal**

A harvest of 20 tons of cantaloupes per acre contains about 50 to 60 lbs. N. The entire crop will contain about 90 lbs. N per acre.

- **Nitrogen uptake patterns**

Nitrogen uptake in cantaloupes is very slow prior to the early runner stage. Nitrogen flux increases rapidly as melons begin to form and reaches a maximum as fruits approach full-size. Very little N is taken up after this point.

Table 31.
Interpretation of NO_3-N levels in cantaloupe petioles and corresponding nitrogen fertilizer recommendations at various growth stages.

Stage of Cantaloupe Growth	Petiole NO_3-N Ranges	Apply this Amount of Fertilizer N
	ppm	lbs./acre
3- to 4-leaves	>12,000	none
	4,000 to 12,000	25 to 50
	<4,000	50 to 75
Early runner	>14,000	none
	4,000 to 14,000	25 to 50
	<4,000	50 to 75
2-inch melon	>9,000	none
	4,000 to 9,000	0 to 25
	<4,000	25 to 50
Full size	>6,000	none
	4,000 to 6,000	0 to 20
	<4,000	20 to 30

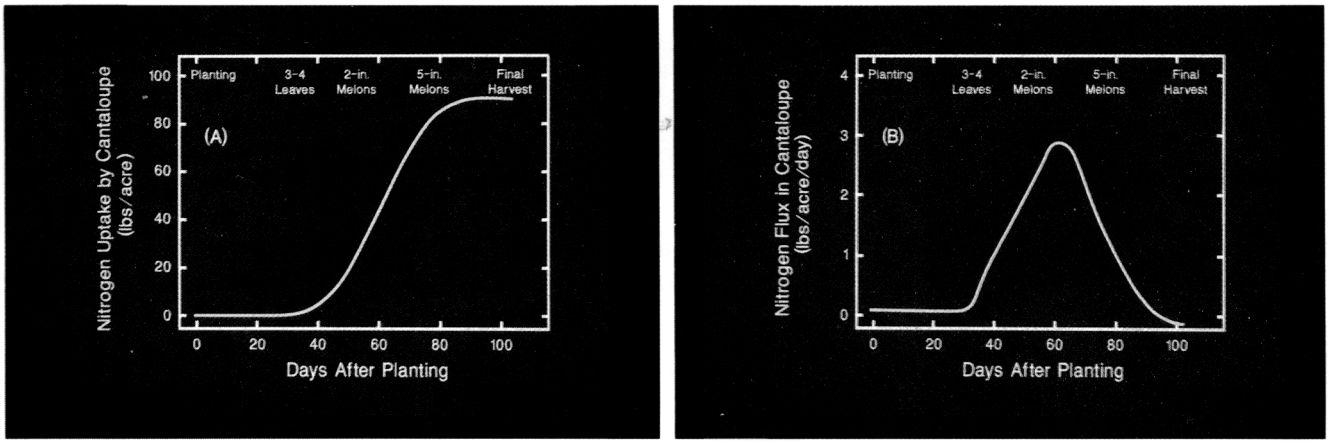

Figure 33.
Cumulative seasonal nitrogen uptake (A) and daily nitrogen flux (B) patterns for Laguna cantaloupe at a yield level of 20 tons per acre.