

# Introduction

The purpose of this circular is to present crop nutrient requirements for commercial vegetables in Florida. It is intended to be a supplement to Extension Circular 225-C, "Commercial Vegetable Fertilization Guide." Certain information included in 225-C is repeated here to increase the clarity of this presentation.

The first part of this publication contains discussions of several topics pertaining to fertilization of vegetable crops. The second part presents, in tabular form, the crop nutrient requirements of vegetables in Florida.

**Table 1.** Crop nutrient requirements for N, P, and K for vegetables grown on irrigated mineral soils.

Crop	Crop nutrient requirements <sup>1,2</sup>		Footnotes
	N-P <sub>2</sub> O <sub>5</sub> -K <sub>2</sub> O		
	Lb/A		
Beans, bush	60-80-80		3
Beans, pole	90-120-120		3
Beans, lima	90-120-120		3
Beets	90-120-120		3
Broccoli	110-150-150		3,4,5,10
Cabbage	120-160-160		3,4,5,10
Carrots	110-150-150		3
Cauliflower	110-150-150		3,4,5,10
Celery	200-300-300		3,10
Chinese cabbage	110-150-150		3,10
Collards	110-150-150		3
Corn, sweet	90-120-120		3
Cucumber	90-120-120		3,4,5
Eggplant	120-160-160		3,4,5,10
Lettuce	110-150-150		3,10,11
Muskmelon	120-160-160		3,4,5,10
Mustard	110-150-150		3
Okra	110-150-150		3
Onions	120-120-120		3
Peas, English	60-80-80		3
Peas, southern	60-80-80		3
Pepper	160-160-160		3,4,5,7,10
Potato, Irish	150-120-140		3
Potato, sweet	60-120-120		3
Radish	90-120-120		3,6,9
Spinach	90-120-120		3
Squash, summer	90-120-120		3,4,5
Squash, winter	90-120-120		3,4,5
Strawberry	120-160-160		5,7,8
Tomato	160-160-160		3,4,5,7,10
Turnip	110-150-150		3
Watermelon	120-160-120		3,4,5,10

**Footnotes:**

<sup>1</sup>These amounts should be applied as fertilizer only to soils testing "very low" in P and K. Use a soil test to determine precisely how much fertilizer is needed.

<sup>2</sup>Additional supplemental sidedress applications of 30 lb N and 20 lb K<sub>2</sub>O should be applied only after rainfall/irrigation amounts ex-

ceed 2- to 3-inches within a 3-day period or 4 inches within a 7-day period. Avoid mechanical damage to plants when applying sidedress fertilizers.

<sup>3</sup>Fertilizer should be applied in split applications in order to reduce leaching losses and to lessen danger of fertilizer burn. Broadcast in the bed or band all P<sub>2</sub>O<sub>5</sub> and micronutrients, if any, and 25% to 50% of the N and K<sub>2</sub>O at planting. Apply remaining N and K<sub>2</sub>O in sidedress bands during the early part of the growing season.

<sup>4</sup>For mulched, subsurface-irrigated crops, incorporate 10% to 20% of the N and K<sub>2</sub>O, plus all of the P<sub>2</sub>O<sub>5</sub> and micronutrients, if any, in the bed. Apply the remainder of the N and K<sub>2</sub>O one inch deep in bands about 6 to 10 inches from the plant row. For mulched, overhead-irrigated crops, incorporate all of the N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O, and micronutrients, if any, in the bed prior to installation of the mulch.

<sup>5</sup>For drip irrigation, incorporate 20% to 40% of the N and K<sub>2</sub>O and all of the P<sub>2</sub>O<sub>5</sub> and micronutrients, if any, in the bed. Apply the remainder of the N and K<sub>2</sub>O periodically through drip tubes according to the rate of crop growth and development. For management systems where both subsurface and drip irrigation are used, apply no more than 20% of the N and K<sub>2</sub>O in the bed before mulching.

<sup>6</sup>Apply all fertilizer prior to or at planting.

<sup>7</sup>From 25% to 30% of the N may be supplied from slow-release N sources, such as sulfur-coated urea or isobutylidene-diurea (IBDU). Due to higher N efficiency with slow-release N sources, it might be possible to reduce the overall N-fertilizer amount by about 15% to 20%.

<sup>8</sup>Apply all P<sub>2</sub>O<sub>5</sub> and micronutrients, if any, and 25% of the N and K<sub>2</sub>O, in the bed. Place the remaining N and K<sub>2</sub>O in a band 2- to 3-inches deep in the center of the bed.

<sup>9</sup>Usually adequate for 2 to 3 crops in succession.

<sup>10</sup>Transplants might benefit from application of starter-fertilizer solution, especially under cool soils.

<sup>11</sup>Includes head, leaf, and romaine lettuces, in addition to escarole and endive.

## Nutrient requirements

Plants require 16 elements (C, H, O, P, K, N, S, Ca, Mg, Fe, B, Mn, Cu, Zn, Mo, Cl) for normal growth and reproduction. The crop nutrient requirement (CNR) for a particular element is defined as the total amount in lb/A of that element needed by the crop to produce economic optimum yield. This concept of economic optimum yields is important for vegetables because a certain amount of nutrients might produce a moderate amount of biomass, but produce negligible marketable product due to small fruit size. Fruit size and quality must be considered in the crop nutrient requirement concept for vegetables.

The crop nutrient requirement can be satisfied from many sources, including soil, water, air, organic matter, or fertilizer. For example, the CNR of potassium (K) can be supplied from K-containing minerals in the soil, from K retained by soil organic matter, or from K fertilizers.