

The CNR for a crop is determined from field experiments that test the yield response to levels of added fertilizer. For example, a watermelon study involving K might be conducted on a soil which tests very low in extractable K. In this situation, the soil can be expected to contribute only a small amount of K for optimum watermelon growth and yield and K must be supplied largely from fertilizer. The researcher plots the relationship of crop yield to fertilizer rate. The CNR is equivalent to the fertilizer rate above which no significant increases in yield are expected. The CNR values derived from such experiments take into account factors such as fertilizer efficiencies of the soils. These efficiencies include fertilizer leaching or fertilizer nutrient fixing capability of the soil. If data are available from several experiments, then reliable estimates of CNR values can be made.

In Florida, CNR values vary according to the type of soil and vegetable crop and have been determined for many vegetable crops on several soils in Florida. For other situations, CNR values are those that have been published in previous Extension circulars dealing with fertilizer management for vegetables. Tables 1 through 4 present CNR values as we currently understand them for vegetable crops in Florida. Using the CNR concept when developing a fertilizer program will ensure optimum, economic yields while minimizing both pollution from overfertilization and loss of yield due to underfertilization.

## Soil testing

The CNR values listed in Tables 1 through 4 are those amounts of nutrients needed to produce optimum, economic yields from a fertilization standpoint. It is important to remember that these amounts of nutrients are supplied to the crop from both the soil and the fertilizer. The amounts listed in the tables are applied as fertilizers **only** when a properly calibrated soil test indicates very small extractable amounts of these nutrients to be present in the soil. Therefore, soil testing must be conducted to determine the exact contribution from the soil to the overall CNR. Based on such tests, the amount of fertilizer that is needed to supplement the nutrition component of the native soil can be calculated.

It is important that soil samples represent the field or management unit to be fertilized. A competent soil testing laboratory that uses calibrated methodologies should analyze the samples. Not all laboratories can provide accurate fertilizer recommendations for

Florida soils. Details on soil testing and how to make it work effectively can be found in Extension Circular 596, "Procedures Used by the IFAS Extension Soil Testing Laboratory, and Interpretations of Results."

**Table 2.** Crop nutrient requirements for N, P, and K for vegetables grown on irrigated organic soils.

Crop	Crop nutrient requirements <sup>1,2</sup>	
	N-P <sub>2</sub> O <sub>5</sub> -K <sub>2</sub> O	
	Lb/A	Footnotes
Beans, bush	0-60-120	3,5
Beans, pole	0-120-180	3,5
Beans, lima	0-120-180	3,5
Beets	0-120-180	3,5
Broccoli	0-120-180	3,5
Cabbage	0-120-180	3,5
Carrots	0-180-180	3,5
Cauliflower	0-120-180	3,5
Celery	0-200-360	3,5
Chinese cabbage	0-100-120	3,5
Collards	0-100-120	3,5
Corn, sweet	0-120-180	3,5
Cucumber	-	4
Eggplant	0-120-240	3,5,
Endive	0-100-180	3,5,6
Lettuce	0-120-240	3,5,7
Muskmelon	-	4
Mustard	0-100-180	3,5
Okra	0-80-120	3,5
Onions	0-120-180	3,5
Peas, English	0-120-200	3,5
Peas, southern	0-100-150	3,5
Pepper	0-160-240	3,5
Potato, Irish	0-160-240	3,5
Potato, sweet	-	4
Radish	0-160-240	3,5
Spinach	0-100-120	3,5
Squash, summer	0-100-120	3,5
Squash, winter	0-100-120	3,5
Strawberry	-	4
Tomato	-	4
Turnip	0-100-150	3,5
Watermelon	-	4

### 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>These CNR values are sufficient for normal conditions. Most crops will respond to supplemental applications of 30 to 40 lb of nitrate-N per acre during periods of cool weather or after a leaching rain.

<sup>3</sup>On new peat soils, make a broadcast application of 11 lb of Cu/A, 7 lb of Mn/A, and 1 lb of B/A before the crop is planted. Use a soil test to determine needs for further micronutrient applications.

<sup>4</sup>These crops not recommended for production on organic soils.

<sup>5</sup>Apply all fertilizer broadcast prior to planting.

<sup>6</sup>Includes escarole and chicory.

<sup>7</sup>Includes head, leaf, and romaine.