analyze soil samples, and therefore not all laboratories can provide the right fertilizer recommendations for all situations. Be sure to choose a laboratory that uses methods that were developed to handle your type of soil, a laboratory that can provide fertilizer recommendations based on field calibration research for your soil and production system. For more information on soil testing and laboratory selection, consult your extension office for publications on this topic.

Controlling pH

In general, the most suitable pH range for many vegetables is 6.0 to 6.5. However, some vegetable crops will tolerate slightly acidic soils (Table 1). Liming acid soils will avoid aluminum and manganese toxicities. It is in the aforementioned pH range, on mineral soils, that most fertilizer nutrients are in greatest availability. There are cases where crop production at less-than-optimum pH is unavoidable. An example is the use of acid soils for potato scab control. Another example is the alkaline Rockdale and marl soils of Dade County, where adjustments in rates and placement must be made for that portion of the fertilizer that is fixed by the soil.

Table 1. A general guideline to crop tolerance of mineral soil acidity.[1]

Slightly tolerant (pH 6.8-6.0)	Moderately tolerant (6.8-5.5)	Very tolerant (6.8-5.0)
Beet	Bean, snap	Endive
Broccoli	Bean, lima	Potato
Cabbage	Brussels sprout	Shallot
Cauliflower	Carrot	Sweet potato
Celery	Collard	Watermelon
Chard	Corn	
Leek	Cucumber	
Lettuce	Eggplant	
Muskmelon	Kale	
Okra	Mustard	
Onion	Pea	
Spinach	Pepper	
	Pumpkin	
	Radish	
	Squash	
	Tomato	
	Turnip	

[1]From Knott's Handbook For Vegetable Growers, 2nd ed.

Table 2. Effect of some fertilizer materials on the soil pH.

Fertilizer material	Approximate calcium carbonate equivalent (lbs)[1]
Ammonium nitrate	– 1200
Ammonium sulfate	– 2200
Anhydrous ammonia	– 3000
Diammonium phosphate	– 1250 to – 1550
Potassium chloride	0
Sodium-potassium nitrate	+ 550
Nitrogen solutions	– 750 to – 1800
Normal (ordinary) superphosphate	0
Potassium nitrate	+ 520
Potassium sulfate	0
Potassium-magnesium sulfate	0
Triple (concentrated) superphosphate	0
Urea	– 1700

[1]A minus sign indicates the number of pounds of calcium carbonate needed to neutralize the acid formed when one ton of fertilizer material is added to the soil.

Liming. On some newly cleared land, soil tests have indicated that lime is required to achieve a suitable pH. Raising the pH to 6.0 to 6.5 increases the availability of most fertilizer nutrients on these soils and also increases the activity of soil microorganisms such as the nitrifying bacteria. Only small amounts of lime are required to change the pH of sandy soil. Therefore, use of a soil test will guide the grower to correct liming and will reduce the possibility of overliming.

Avoid overliming. This can be a problem in Florida where routine limestone applications are made without reference to soil testing and/or where alkaline irrigation water is applied. Overliming can lead to nutrient deficiencies, especially with micronutrients, and it can reduce the accuracy of soil testing programs and resulting fertilizer recommendations.

Many fertilizer materials lower the soil pH when added to the soil. The effect of some fertilizer materials on the soil pH is shown in Table 2. The approximate calcium carbonate equivalent is a measure of the acid-producing potential of the fertilizer. Fertilizer applications should therefore be considered in all good liming programs.

When adding lime, it is critical that it be thoroughly incorporated in the soil throughout the plow zone.