VEGETABLE CROPS DEPARTMENT

The VEGETARIAN Newsletter

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TO: COUNTY EXTENSION DIRECTORS AND AGENTS (VEGETABLES AND HORTICULTURE)
AND OTHERS INTERESTED IN VEGETABLE CROPS IN FLORIDA

FROM: James Montelaro, Vegetable Crops Specialist

VEGETARIAN NEWSLETTER 74-2

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I. COMMERCIAL VEGETABLE PRODUCTION

A. Soil Testing - A Tool for Conserving Fertilizer

Vegetable growers in Florida are now expressing grave concern over the problems of shortages and increase in the price of fertilizer. Upon analysis, the problem may not be so serious as it is thought to be. The reasoning behind this statement is that vegetable growers generally used more fertilizer than was necessary to produce their crops in the past. Secondly, excessive use of fertilizer often resulted in reduction in yield and/or quality. It is felt, therefore, that lower cost from use of less fertilizer would tend to offset the increase in per unit cost of fertilizer. In other words, by using the limited supply of fertilizer available now, growers might produce good yields of vegetables at a per unit cost for fertilizer which may be comparable or only slightly higher than that of recent years.

This article, the third in a series, deals with soil testing and how growers may use it to help them cope with the problems created by increased cost and fertilizer shortages. A soil test taken before planting is a very valuable tool for determining: (1) need for lime, and (2) residual fertilizer nutrients. The analysis should show pH, levels of calcium, magnesium, phosphorus, potassium, nitrate-nitrogen and possibly the presence of undesirable or toxic ions.

The pH test not only determines the need for lime, but also what type of lime that might be needed. If magnesium level is found to be low, dolomitic limestone would be recommended. Otherwise, high calcic limestone would be used. A general guideline to use in determining type of lime is the calcium to magnesium (Ca/Mg) ratio. A Ca/Mg ratio ranging from 4 to 1 through 8 to 1 is satisfactory for vegetable crops.

In old soil phosphorus accumulates to high levels from applications of fertilizer over a period of years. Potassium, on the other hand, is leachable but may be found to be present in significant amounts depending on rainfall patterns, soil type, rates of prior applications, etc. A general rule of thumb to follow for vegetable crops is to establish ranges of low, medium and high (depending on soil test method used) for phosphorus and potassium. For example, when levels of phosphorus are found to be:

(1) High - Use only one-third of the amount of P<sub>2</sub>O<sub>5</sub> recommended for the crop.
(2) Medium - Use two-thirds of the amount recommended for the crop.
(3) Low - Use the full amount recommended.

The same rule can be applied to potassium (K<sub>2</sub>O) levels, also.

Soil tests do not tell much about nitrogen levels in a soil. Most sandy soils can be considered to be low in nitrogen unless the test shows a high nitrate-nitrogen level or a heavy cover crop was turned under in the recent past. The muck soils contain large amounts of organic nitrogen and, therefore, do not need additional nitrogen except during periods of cold weather when nitrification is retarded. Supplemental nitrogen should always be from a readily available source—never in an organic form.
Intensity and Balance Soil Test - During the growing period, one of the best soil tests available is the "Intensity and Balance" soil test. Briefly, it is a test where the extracted soil solution is used to determine total amount of soil soluble salts by electrical conductivity (Intensity) and plant nutrients by chemical methods (Balance). The Intensity test is simple, easy to perform and relatively inexpensive. It can be made by any soils lab or even by the grower. The test can be used to determine if supplemental fertilizer might be needed during the growth of the crop. It practically eliminates guesswork and prevents application of supplemental fertilizer when it is not needed.

The Balance test can be a valuable test, also. By showing actual levels of potassium, nitrate-nitrogen, calcium, magnesium and undesirable elements in the soil solution, the grower is able to make adjustments in supplemental applications more accurately and possibly with less fertilizer than otherwise. The addition of supplemental fertilizer when it is not needed is not only costly, but can actually injure the crop resulting in reduced yields and quality. NOTE: Anyone interested in Intensity and Balance method of soil testing can write this office for a manuscript describing the technique.

(Montelaro)

B. Control of Foliar Diseases of Watermelons

In his discussion on the control of foliar diseases of watermelons recently at a meeting of the Florida Watermelon Growers and Distributors Association, Dr. D. L. Hopkins (Assistant Professor, Agricultural Research Center, Leesburg, Florida) brought out some interesting facts which should be valuable to all growers of this crop. In a way of introduction, he pointed out that "Fungicide sprays may be applied by various high-volume or low-volume ground sprayers and by airplane sprayers. Regardless of the method of application, complete coverage of the foliage is most important for good disease control. Inadequate coverage results in poor disease control. The number and timing of spray applications depend primarily on weather conditions. More sprays are required generally in southern Florida than in central and northern Florida. In southern Florida, fungicide sprays are necessary from seedling emergence; whereas, in northern Florida regular fungicide sprays usually are not necessary until vining or fruit-set stages."

Dr. Hopkins described gummy stem blight and downy mildew as the two most prevalent and damaging foliar fungus diseases in watermelons currently. Gummy stem blight causes leafspots, stem cankers and fruit rot. Fortunately, all of the recommended fungicides give control but under severe conditions. Difolatan was the most effective against this disease in his tests at Leesburg.

Downy mildew, or "wildfire" as it is commonly called by growers, was extremely destructive on watermelons two years ago. Once it starts, it can devastate a field in a matter of days. Like gummy stem blight, there are some fungicides which are better than others for control of this disease except when conditions are right for rapid spread of the downy mildew fungus. These are: Dithane M-45, Manzate 200 and Bravo. Benlate affords no control and Difolatan only fair control of downy mildew.

The other fungus diseases of watermelons are anthracnose, Cercospora and Alternaria. All of these diseases can be controlled by the recommended fungicides.
Bacterial leafspot is a disease which is associated with cool, wet weather. It usually disappears with the onset of warm, dry weather, but if it becomes severe, it can be controlled with fungicidal copper sprays (3 lbs. of 53% copper per acre).

Dr. Hopkins stressed the differences in degree of control offered by the approved and recommended fungicides for the major diseases of watermelons. He stressed the advantages of good disease identification for the effective control of diseases on this crop. In the absence of positive identifications, it is advisable to alternate the recommended fungicides to insure good control. Data on the recommended fungicides and a summary of the research results discussed by Dr. Hopkins are presented in Table I and Table II, respectively.

Table I. Recommended fungicides for the control of foliar diseases of watermelons.

<table>
<thead>
<tr>
<th>Fungicide</th>
<th>Rate (amt./acre)</th>
<th>Min. Days to harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maneb 80%</td>
<td>1 1/2 lbs.</td>
<td>5</td>
</tr>
<tr>
<td>Dithane M-45 80%</td>
<td>1 1/2 lbs.</td>
<td>5</td>
</tr>
<tr>
<td>Manzate 200 80%</td>
<td>1 1/2 lbs.</td>
<td>5</td>
</tr>
<tr>
<td>Difolatan 4 flowable</td>
<td>2 1/2 pts.</td>
<td>NTL</td>
</tr>
<tr>
<td>Bravo 75% or 6F</td>
<td>1 1/2-2 1/2 lbs. or 2 1/2 pts.</td>
<td>NTL</td>
</tr>
<tr>
<td>Benlate 50%</td>
<td>1/2-1 lb.</td>
<td>NTL</td>
</tr>
</tbody>
</table>

1This is the minimum number of days allowed between the last foliar application and harvest. NTL = No time limit.

2Benlate does not control downy mildew or Alternaria leafspot.

Table II. Fungicidal control of downy mildew (DM) and gummy stem blight (GSB) of watermelon at Leesburg, Florida.

<table>
<thead>
<tr>
<th>Fungicide</th>
<th>Rate (Amt./100 gal. per acre)</th>
<th>GSB (1970)</th>
<th>DM (1971)</th>
<th>1971 yield (tons/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dithane M-45</td>
<td>1 1/2 lbs.</td>
<td>39</td>
<td>18</td>
<td>26</td>
</tr>
<tr>
<td>Manzate 200</td>
<td>1 1/2 lbs.</td>
<td>--</td>
<td>27</td>
<td>24</td>
</tr>
<tr>
<td>Bravo</td>
<td>1 1/2 lbs.</td>
<td>45</td>
<td>35</td>
<td>25</td>
</tr>
<tr>
<td>Difolatan</td>
<td>2 1/2 pts.</td>
<td>22</td>
<td>53</td>
<td>26</td>
</tr>
<tr>
<td>Benlate +</td>
<td>1 1/2 lb.</td>
<td>42</td>
<td>35</td>
<td>24</td>
</tr>
<tr>
<td>Manzate 200</td>
<td>1 lb.</td>
<td>--</td>
<td>89</td>
<td>97</td>
</tr>
<tr>
<td>Unsprayed</td>
<td>--</td>
<td>89</td>
<td>97</td>
<td>18</td>
</tr>
</tbody>
</table>

1Ratings were made the third week of June in both years.

(Montelaro)
C. Problem Weed Infestations in Vegetable Fields

Past issues of this newsletter have pointed out problems deriving from weed infested non-crop areas and have emphasized that control programs for these areas can lessen weed pressures on adjoining crop land on the long-term basis. In many instances, crop land contains areas where certain hard-to-control weeds dominate. Crops planted in such areas can suffer reduction in growth and yield. The recommended herbicides for use in the crop often does not control the weed, and the problem area becomes worse and spreads in size the following year. What are some alternatives a grower can consider to combat such a situation?

1) Spot Treatment - This area can be removed from production and treated by mechanical means (mowing, flaming, discing, etc.), or chemical means (non-selective, non-crop herbicide) periodically to reduce the population. The control measure should be used frequently enough to prevent any of the weeds in the area from reaching maturity. In this way, neither will seed be produced nor will the vegetatively reproducing stages be favored. Thus, the method tends to reduce the weed population through starvation and normal attrition of the existing population and prevents reproduction and potential for new generations.

2) Alternate Crop - The weed species may not be controlled by herbicides labeled for the desired crop, but may be effectively controlled by labeled materials for another crop. Growing that crop with the effective herbicide would then reduce the weed population pressure. The desired crop could then be grown again. This method would be excellent, but there are very few situations where this can be done.

Frequently, alternating crop species can help eliminate some weed problems. Alternating a tall-growing crop with a low-growing crop, or a dense-canoped crop with a more open-habit crop can often be helpful.

For example, sweet potatoes produce a dense canopy of foliage for a long growing season. The shade produced by this canopy effectively inhibits, or suppresses, the growth of weed seedlings which emerge after the canopy has formed. Thus, the number of weed seeds in the soil is reduced and no new seeds are added.

For growers with established marketing habits, the first set of alternatives would be the most attractive. Carefully and methodically done, specific problem areas can be checked or contained in size initially and within several years reduced to a manageable level so that the area can be placed back in production.

(Kostewicz)

D. New Celery Bulletin Available

Florida Agricultural Experiment Stations Bulletin 757, entitled "Celery Production on Organic Soils of South Florida" is available for distribution. This is a non-technical report of research and information about celery production from seeding through harvesting prepared by eleven researchers located at the Agricultural Research and Education Center, Belle Glade, and the Vegetable Crops Department, Gainesville. All authors are recognized authorities in the particular phase of research on which they have reported.

Celery ranks third in value (over 31 million dollars in the 1972-73 season) among vegetables grown in Florida, and this State produces about 50% of the U. S.
supply during the winter and spring months. The purpose of this bulletin is to provide current information on cultural requirements, varieties, nutrition, harvesting, precooking, packing and control of diseases, weeds, nematodes and insects. The bulletin is particularly well illustrated with pictures, including some in color to aid in describing physiological disorders; nutritional deficiencies and diseases. Bulletin 757 is an excellent reference for commercial celery growers, shippers, county extension agents, packinghouse operators, buyers, inspectors, seedsmen and other commercial fieldmen dealing with celery growers and shippers. It can be obtained from County Extension Offices or the Vegetable Crops Department in Gainesville.

II. HARVESTING AND HANDLING

A. Postharvest Handling of Strawberries

Strawberries are among the many items in produce departments of large supermarkets, and one of the least popular with produce managers. This commodity is very perishable and requires constant culling to eliminate over-ripe and decaying berries. The high loss rates of berries during retailing also contribute to their unpopularity. There are two primary reasons for strawberries being highly perishable. First, they have a relatively rapid respiration rate which means that they "live fast" and will quickly become old and over ripe. Second, they are very susceptible to decay. There are a number of things that can be done during harvesting and handling of strawberries that can reduce the loss between the grower and the consumer.

Harvesting - Proper supervision of pickers is extremely important. Strawberries should be dry when picked and care should be taken to pick at the proper stage of maturity. Immature berries will not ripen properly and over-ripe berries will soon break down and provide a good medium for decay which spreads rapidly through the entire basket. Bruised berries will react much like over-ripe ones, so care should be taken in both picking and packing. Containers should not be over-filled since this too will cause bruising when the flats are stacked. As much grading as possible should be done during harvesting to eliminate handling the berries again.

Handling - Strawberries should never be left exposed to the sun after harvest, they should be precooled immediately after packing, and all subsequent operations should be carried out as near to 32°F (0°C) as possible. The best method of precooking strawberries is by forced air. This means that instead of cold air surrounding the crates (as in the case of room cooling), the cold air is forced directly through the container and comes into contact with each berry to remove the heat. This method cools the berries 5 to 10 times faster than just placing them in a cold room where cold air is around the container and much of the cooling is done by convection. Since moving air takes the path of least resistance, it is apparent that just big fans will not do the job unless the air has no way to move except through the containers. It is also evident that the containers must be designed to allow adequate air to pass through. Precooling strawberries can greatly aid the maintenance of quality throughout the marketing chain. Forced air is the best method of precooing this particular commodity.

(Showalter)

(Hicks)
A. Timely Topics

With this issue of the "Vegetarian" begins a new format for the Home Gardening section. Five timely topics (in question and answer form) will be timed for each week beginning with the middle of the month continuing through each successive week thereafter, with one bonus question thrown in (good for any time).

The purpose of the "Timely Topics" is to supply agents with material for newspapers and radio shorts on a regular basis.

(1) Timely Topic for week of February 14-20.

**Question**

I would like to plant a vegetable garden to help reduce the high cost of food. Can I grow vegetables cheaper than I can buy them in the store?

**Reply**

Much depends upon the success of your venture and the methods you use to cut production costs. You must keep in mind that when you become the producer, you bear the risk, whereas, when you purchase the produce, the risk has been assumed by the farmer. Obviously, a partial or total crop loss means your gardening endeavor cost rather than saved you money.

In order to cut production costs, thus widening the profit margin, you must buy the minimum materials necessary to do the job. For example, if your soil does not need liming, don't buy lime to put on it. And, don't buy an assortment of sprays and dusts of the wrong kind. Find out beforehand what will do the job, purchase and apply that material only.

One further point, your time and labor are the main free ingredients you have to invest in your garden. Do what you can yourself. Expensive garden machinery pays off in the long run, but not in the short run, unless you have a very large garden.

(2) Timely Topic for week of February 21-27.

**Question**

I am new to Florida and would like to know what variety of tomato I should plant in my garden.

**Reply**

One of the pleasures of gardening is to try new and different things. Although you might experiment if you have the space and time, your best bet is to grow the proven varieties. The State's leading commercial variety for staking is Floradel, and the leading ground variety is Walter. Both produce a large globe-shaped fruit of the type most people prefer. They are resistant to many of the plant diseases so prevalent in Florida. Another proven variety just arriving on the scene is the Florida MH-1. It should prove to be very acceptable for home
gardens as well as farmers due to its wide range of disease resistance and firm long-lasting fruits. Other varieties known to give satisfactory results are Manalucie, Homestead, Indian River and Manapal.

(3) Timely Topic for week of February 28-March 6.

Question

I am preparing my soil for a spring vegetable garden. How should I fertilize it?

Reply

The kind, amount and method for fertilizing your vegetable garden all depend on such things as soil type and present fertility level. Certainly, when making a recommendation for an anonymous garden, one has to make a few general assumptions. First, since there may be several kinds and varieties of vegetables growing in the plot at one time, a general garden fertilizer would be required. Second, unless you have had the soil tested and know to the contrary, we must consider the soil low in most of the required plant nutrients. On sand, marl, rock or clay soils, apply a general garden fertilizer such as 6-8-8 just before planting, in this manner:

(1) Broadcast two pounds per 100 square feet over the entire garden plot and mix into the soil.

(2) Apply an additional two pounds in a narrow furrow (band) 2 to 3 inches to the side of and slightly below the level of the seed or planting row.

On organic soil where nitrogen is likely to be present, use low nitrogen fertilizer, broadcasting one pound and banding another pound per 100 square feet.

(4) Timely Topic for March 7-13.

Question

What vegetables should I be planting at this time of year in my garden?

Reply

Throughout most of Florida, most of the cold weather is behind us. This is fine for the warm-season crops, but bad news for many of the cool-season crops. Therefore, concentrate on such warm-season crops as the following: tomatoes, peppers, eggplants, winter squash (acorn, etc.), summer squash (crookneck, etc.), cucumber, cantaloupes, watermelons, beans (lima, pole, bush, snap), Southern peas, okra, sweet corn, potatoes and sweet potatoes.

Some of the cool-season crops that may yet do well are: green onions, beets, collards, endive, leaf lettuce, bibb lettuce, romaine, mustard, turnips and radish.

(5) Timely Topic (Bonus - good any time).

Question

I want to grow vegetables for my own use, but I do not have enough space for a garden. What can I do?
Reply

Consider growing vegetables in containers (minigardening), or check to see if there is a Community Gardening Project in which you might participate in your area. Contact the local county Cooperative Extension office for details.

(Stephens)

B. Know Your Vegetables - Pigeon Pea

Pigeon pea (Cajanus cajan (L.) Millsp.) is also called Congo pea, No-eye pea, Red gram, Arhur, Urhur, Grandul, Dhal, Toor, Gunds pea, Porto Rico pea, and alverja.

This pea-like legume is much propagated in the tropics for the edible seeds and pods. Although an important food plant in the West Indies, they are not grown commercially to any great extent in the U.S., or for that matter, even in home gardens. Back in 1950, there were 10,000 acres of pigeon peas in Hawaii.

It is an erect annual or short-lived perennial reaching a height of 3 to 10 feet. The coarse bush is deep rooted, thus has wide adaptability and grows well on semi-arid land. It has trifoliate leaves and either yellow or yellow and red flowers.

Where grown, pigeon pea is sown 8 to 10 lbs. seed per acre in rows 3 to 4 feet apart and thinned to 12-18 inches between plants. Some types are killed by frost, while certain selections appear to be hardy. Yields have been obtained in other areas of the world as high as 35 tons of green matter per acre and 30 bushels of seed per acre.

Some of its uses are as human food, fodder, browse plants, green manure, and a grain cash crop.

(Stephens)