VEGETARIAN NEWSLETTER 75-10

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I. NOTES OF INTEREST

A. Vegetable Section Program for FSHS Meetings - Last Call

The program for the Vegetable Section of the Florida State Horticultural Society Meetings to be held November 4-7, 1975 will feature 30 excellent papers. The subject covers many phases of production and marketing of a number of vegetable crops. This program is a must for growers, industry representatives and all others serving Florida vegetable industry one way or another. We hope to see a record turnout for this year's program.


(Montelaro)

II. COMMERCIAL VEGETABLE PRODUCTION

A. Water Control Under Full-Bed Mulch Culture

Vegetables growing under full-bed mulch culture developed poorly in many cases during the dry spring seasons of 1974-75. On close observation, it was noted that the surface of the soil was quite dry ranging in depth from 0.5 to 1.5 inches. Most of the available fertilizer is found at soil surface under full-bed mulch culture. It is no wonder, therefore, that crops grow poorly when moisture is less than optimum in that area of the bed.

Dr. Paul Everett, Soils Chemist, ARC, Immokalee, has observed this problem very closely over the years. He discussed it in detail in a talk given in September at the Annual Tomato Institute. Dr. Everett pointed out that once the top layer of soil is allowed to dry out and the fertilizer salts are allowed to crystallize, it is hard to reestablish the necessary moisture level in that area. According to Dr. Everett, the best way to control the problem of drying out of the top layer of soil is to avoid it.

The following suggestions were given as means of avoiding the problem:

1. Level the land to facilitate uniform distribution of irrigation water.
2. Shape and press beds uniformly to a height of 8 to 10 inches.
3. Start irrigation as soon as plastic mulch is laid to bring soil moisture up to optimum for planting.
4. Maintain a water table of about 15 inches. Do not let it drop much below this level as the soil surface may dry out.

Some growers, in trying to double-crop mulched fields purposely let the water table drop because they felt it made it easy to destroy old crop residues and to replant the new crop. In a few cases, growers were not able to reestablish adequate soil moisture at the soil surface in spite of continued seepage irrigation. If this happens, somewhat drastic measures may have to be taken to correct the problem. In one instance, the grower was advised to punch holes in the plastic and to overhead irrigate. The measure was successful as a good crop was produced. However, it would have been best to avoid the problem.

(Montelaro)

B. Effects of pH on Soil Biology

Over the years, this newsletter has carried numerous articles on the effects of change in soil pH on the availability of fertilizer nutrients. One area that has not been discussed adequately is pH effects on biological activities in the soil.
The most common example is the effect of pH on scab in potatoes in some areas of Florida. Where scab is a problem year after year, growers should maintain pH of the soil below 5.5. We recognize, however, that potatoes grow better at a higher pH than 5.5 and is recommended if scab is not a problem.

Recent research showing a degree of suppression in Fusarium wilt of tomatoes by increasing soil pH to about 7.0 has aroused considerable interest among growers. A higher pH might not just help to control Fusarium wilt, but also to improve fruit quality through better calcium nutrition. In practice, the idea did not prove to be overly advantageous. The culprit was Verticillium wilt. In fact, "Vert" wilt, long a serious problem at Homestead, is now considered to be an important disease in some of the other tomato producing areas as well.

Soil pH affects root knot nematodes, also. In a paper presented at the Annual Tomato Institute in September, Mrs. Overman, AREC, Bradenton, discussed her observations on this subject. She noted a significant increase in actual number of nematodes as soil pH increased. However, the increase in overall plant growth may have outweighed any disadvantages from the increase in the root knot galls.

There are many other biological activities which are affected significantly by soil pH. Except in special situations, the most economical soil pH for vegetables is 6.0 to 6.5. A grower wanting to raise pH above 6.5 for a special purpose should weigh both advantages and disadvantages that may result from the change. The main disadvantage, probably, would be reduction in the availability of nutrients, especially micro-nutrients and phosphorus. The development of other soil pest problems should be taken into consideration as pointed out in this article.

(Montelaro)

C. Recent Herbicide Residue Problems

Several instances of herbicide residue problems have come to our attention this fall. In some areas of the state, it is the usual practice for growers to produce both agronomic and vegetable crops during the same season in a rotation. This practice is particularly widespread in the northern part of the state where late spring and summer crops may be followed with a fast growing, fall vegetable "cash" crop. In most cases, the vegetable will be a legume such as green beans, southern peas, or a cucurbit such as cucumbers or squash. Both the legume and cucurbit families tend to have a greater sensitivity to herbicides than other groups of vegetables.

Because of various factors, there is a broader range of herbicide materials registered for use on agronomic crops than on vegetables. A few of these materials are relatively persistent making them more attractive as herbicides. This can be a disadvantage if it is desirable to multiple-crop the same land in a single season. Normally between seasons, the effects of rainfall, temperature, microbial activity and other degradation factors result in breakdown and dissipation of the materials so that there is little carryover to the next season. However, where one crop immediately follows another, the herbicide program used in the first crop must be considered.

One recent example involved atrazine applied to a corn crop. The application was made as a late post-emergence spray to control weeds needed to facilitate harvest. Following the corn, green beans were planted and upon emergence, they began to exhibit abnormal symptoms. With a little help, the grower was able to pin down what had happened. While not immediately popular with the grower, it was soon recognized that this usage in terms of the subsequent crop was not in accordance with the label.
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This example emphasizes the fact that growers should make themselves fully aware of label instructions for use and also of precautions stated on the label. These are placed on the label for the purpose of informing the grower of potential problems that can occur if not used properly. In the example given, atrazine labels clearly state that land treated should not be planted to any crop but corn until the following season or injury may occur. A few minutes spent reading the label carefully and thoroughly can help prevent problems.

(Kostewicz)

D. pH Control for Tomatoes Under Full-Bed Mulch

Tomato growers on the West Coast of Florida have made dramatic changes in cultural practices during the past five years. The "full-bed mulch system" has become a standard method for approximately 90% of the growers in the area. The system involves a minimal stress environment for the plant by careful adjustment of soil nutrition and soil moisture. Larger plants and higher yields are obtained, therefore, even greater care must be exerted to maintain this soil-plant-water balance.

New land is becoming more difficult to obtain and expensive to prepare. Growers are learning to accommodate to this change by using more of the technology that makes old land production more effective. Old land "technology" includes land leveling, fumigation, well-planned sanitation practices, long-term maintenance of a slightly acid pH, precise moisture control, and careful attention to fertilizer application.

For the past 20 years, horticulturists have considered a pH range of 5.5 to 6.5 as desirable for most vegetable production soils. More recent observations at the Bradenton AREC point to the possibility that under full-bed mulch on the sandy, acid flatwood soils of the West Coast of Florida a higher pH, in the range of 6.5 to 7.0 may be more productive for tomatoes for the following reasons:

(1) At this higher pH, the calcium level is most likely to be greater, thus offsetting the greater demand for this element for the larger plant and fruit load. Blossom-end rot is less likely to occur.

(2) At this higher pH, the nitrifying bacteria, which convert ammonia to available nitrates, are most likely to recover more quickly after fumigation. During fumigation, nitrifying and ammonifying bacteria are severely suppressed along with the pathogenic organisms. It is desirable to create as favorable a recovery environment as possible for the nitrifying bacteria.

(3) At this higher pH, Fusarium wilt disease activity is noticeably decreased. Evidence by Professors Woltz, Jones and Overman at AREC Bradenton indicates that the Fusarium fungus is less able to absorb iron, manganese, zinc, magnesium and phosphorus at this pH. At this higher pH, Verticillium wilt thrives, however, and careful attention must be given to fumigation and use of Verticillium wilt resistant varieties such as 'Tropic' and 'Floradade'.

(4) At this higher pH, growers must be aware of the need for careful attention to a well-planned fertilizer program for major, secondary and trace elements. Generally, the basic fertilizer program provides for an almost luxury level of major and secondary nutrients. Trace elements in fritted chelated or simple chemical (oxides, sulphates) forms are usually added in one of the fertilizer applications prior to mulching. Growers should be alert for early signs of copper, manganese, zinc, boron and iron deficiency. These trace elements are less available to the plant at this higher pH and must be supplied in the soil (or by foliar treatment in an emergency).
Soil reaction control should be considered a year-round practice. If fallow fields to be planted to tomatoes are allowed to degrade to a low pH, many of the trace elements may be lost by leaching. Fields should be tested 4-5 months prior to planting, to determine corrective lime needs. The lime should be applied broadcast and thoroughly incorporated at least 3-4 months before field-setting tomatoes.

Dolomitic limestone, 35% magnesium carbonate and 50% calcium carbonate (by Florida minimum grade standards) and agricultural limestone (90% calcium carbonate) are both good sources for amendment. Soil test recommendations should be followed carefully. Correction at planting time is poor planning. Growers who try to modify a pH at planting time usually must contend with nutritional problems in the current crop.

(Marlowe)

III. HARVESTING AND HANDLING

A. Vegetable Qualities Associated with Consumer Satisfaction

Changes in growing, harvesting, preparation for market, merchandising and consumer preferences for vegetables make a periodic appraisal of all these factors desirable. In comparison with other countries, the production and marketing system in the U.S. is considered remarkably efficient in distributing an immense quantity of vegetables. However, the marketing bill for fruits and vegetables in the U.S. increased 11 percent during 1974 and consumers, looking for both lower prices and better eating quality, are blaming growers and retailers for their dissatisfaction.

Since vegetables are biological in nature and subjected to many environmental variables during growth, it is not possible to obtain 100 percent of the yield in perfect quality. Varying proportions of the crop will deviate from perfection in terms of shape, size, defects, color, flavor and texture. During the harvesting and preparation for market, decisions have to be made as to how much detraction from perfection can be tolerated before the product must be discarded or downgraded from top quality. Even more important is the consumer decision of the level at which a vegetable passes from acceptability to rejection.

Defects may be caused by insects, diseases, weather, poor nutrition, improper maturity at harvest and damage from improper handling. The importance of defects in determining the acceptance of a vegetable should be emphasized because one defect can cause consumer rejection of a lot that rates highly for all other aspects of quality. Supermarket sales records indicate that consumers will regularly purchase only those fruits and vegetables which please them in general appearance, size and overall quality.

In a recent series of articles, The Packer has attempted to show that marketing orders are under increasingly heavy attack from consumer groups who claim that they should have a choice of low-quality produce at a cheaper price along with high-quality items. They condemn the quality standards, particularly visual standards, as the growers method of controlling how much produce gets shipped to market and the consumer price. It is true that the nicest looking produce is not necessarily the best tasting or highest quality by objective quality measurements. However, it should be understood that if the item does not appeal to the consumer, it will not be purchased. Consumers who encounter inconsistent eating quality in a particular produce item will tend to lose confidence in it and purchase something else. One of the biggest problems in retailing produce is too much low quality. Retailers claim that consumers, even in low income areas, will not buy poor produce.
The supply and demand system further confuses customers when such factors as adverse weather brings about a short, low-quality crop and high prices. The bad quality is often more expensive than the good quality available from an oversupply. It should also be stressed that produce is very perishable, and when vegetables with slight decay or mechanical damage are shipped because of short supply, high prices, or other factors, there is a good chance of losing the vegetables plus the containers and other marketing costs.

When specific crops are considered, California growers of peaches, plums, pears and nectarines claim many benefits from their marketing orders such as better consumer quality and increased sales. The maturity standards applicable to fresh fruits under the California Tree Fruit Agreement aim to prevent the harvest of fruit which will not satisfactorily complete the ripening process. The following statements from their 1974 annual report could be applied to certain vegetables shipped from Florida. "The buying trade and shippers are not prepared to protect consumers from immature fruit. They share a deathly fear of ripe fruit because it must be sold rapidly and often with considerable waste. The arrival of a pear car showing slight color in the New York Fruit Auction, ideal for consumers if they could get it, is inevitably a price disaster and this is true of all other fruits which arrive showing evidence of softening."

"On the other hand, an immature pear will bring the market price although its long range effect upon the market may be deleterious and consumers who purchase the fruit receive no value at all."

In a nationwide study conducted by the USDA in March, 1974, to measure consumer opinions of food products sold in stores, tomatoes got the highest dissatisfaction rating of 31 individual items included in the survey. Since consumers criticized price, ripeness and taste most severely, it should be obvious that riper, better-tasting tomatoes are needed for increased consumer satisfaction.

The superiority of homegrown tomatoes (even though many of the popular varieties do not have as good a flavor as many commercial varieties grown under the same conditions) or those purchased from local growers after red-ripe harvest has been generally accepted. Is it possible that ripe tomatoes do not fit easily or economically into the Florida large volume marketing system? Past experience indicates that customers apply somewhat different standards of quality in buying from local growers than when they go to the supermarket. Customers tend to be less demanding in terms of shape, size and surface defects for locally-grown produce if they have found through previous purchases that eating quality is superior. Mature-green tomatoes can be harvested and ripened into high-quality fruit. However, pickers have difficulty in judging readiness for harvest when the fruit are green in color, and mechanical equipment is not available that will separate immature from mature-green tomatoes.

In looking at the reasons why we are less successful in meeting foodstore customer satisfaction for quality of tomatoes in comparison with other vegetables, attention is focused on maturity at harvest. Many vegetables grown in Florida can be harvested over a time period greater than that for tomatoes without so much effect on eating quality. For example, sweet peppers, carrots, radishes, cabbage, potatoes, and greens can be harvested when they are 1/2, 3/4 and full size with relatively little change in flavor and texture in comparison with tomatoes or watermelons. Consequently, the interaction of maturation and quality changes should be included in development of all production and marketing systems.

(Showalter)
A. Timely Gardening Topics

These questions and answers are suggested for agents' use in developing periodic (weekly) radio or newspaper briefs. They are based on letters of inquiry from Florida gardeners.

(1) Timely Topic for week of October 12-18.

Question

I am having difficulty obtaining strawberry plants for my home garden this fall. Would it be okay to use some plants left over from my spring garden?

Reply

Normally, in Florida it is best to grow strawberries as an annual, starting each fall with good healthy certified plants from a nursery or plant dealer. Lacking the availability of such plants (and they are in short supply this fall), your own plants might be better than none, especially if they are a common Florida variety such as 'Tioga' or 'Florida 90'. The fact that they have been growing throughout the long hot, humid summer without special care makes them particularly prone to have foliage disease and root-nematode injury. Be sure to select the very best plants you have, discarding those severely infected with leaf spots and knobby, stunted or darkened roots. Keep in mind that many northern nurseries in states such as Tennessee grow varieties adapted to Florida. It is quite important to plant only those varieties proven to be adapted to Florida's climate, such as 'Florida 90', 'Tioga', 'Sequoia', and 'Florida Belle'.

(2) Timely Topic for week of October 19-25.

Question

I am digging sweet potatoes from my garden and would like to know how to prepare them for storing.

Reply

First of all, try to avoid injuring the roots while digging. Then the roots are "cured" in order to heal the wounds of those that are nicked or injured. Wounds are healed when they have formed a corky, suberized skin over the wound. To accomplish this "curing" or healing, place the roots where the temperatures can be kept warm (80-90°F) and the humidity high (80-90% RH). A small batch may be cured in the following manner: (1) place roots in a crate or ventilated box, (2) wash or moisten the roots, (3) wrap the crate in plastic, which has small holes punched at random for ventilation, (4) set crate in shed, garage or other warm place, but not in full hot sun, (5) let cure for one week, (6) remove cover, sort out decayed roots, store others in cool, moist place 60°F and 80-85% RH.

(3) Timely Topic for week of October 26-November 1.

Question

I am growing my vegetables in containers and need to know how to fertilize. Can you help me?
Reply

You did not say what sort of soil or growing medium you are using, which will make a difference in how you fertilize. In general, the more porous growth media, such as sand and gravel, closely approximate hydroponic culture and, as such, dry out fast and do not hold nutrients very long. Therefore, frequent plant feedings are necessary. Normally, the nutrient solution must be added and drained in the containers once or twice each day. On hot, dry days, as many as five nutrient drenchings are needed. A well-balanced nutrient solution, either pre-mixed or prepared from soluble commercial fertilizer, should be used here. Soil substitute mixes that contain organic materials and fertilizer, also will need additional fertilizer from time to time, but less frequently than for the sand or gravel. Once every week or two may be sufficient. Use either a soluble fertilizer or a dry complete mix on the surface and water in.

(4) Timely Topic for week of November 2-8.

Question

What vegetables might I include in my garden for both ornamental as well as food purposes?

Reply

Commercial seed company catalogs have many dual-purpose items included. Many of these offerings are more novel than useful. Briefly, here are examples of some items available. Ornamental, dwarf eggplants have lavender blossoms and small white egg-size fruits which turn yellow. Flowering cabbage has contrasting leaf colors from red, rose, white or pink against emerald green. Flowering kale is similar to the cabbage, but has more frilly leaves. Ornamental lettuce ranges from the curled bright green leaves of 'Salad Bowl' to 'Ruby', a bright ruby red leaf lettuce. 'Bellboy Hybrid' pepper turns red early, while golden varieties turn yellow. 'Banana' pepper is long, yellow and very attractive. There are many shapes, sizes and color represented in the ornamental (but hot) peppers. 'Rhubarb' swiss chard is excellent as a border plant, being green-leaved with red stems. Many tomato varieties are decorative, either trellised or in pot plantings, such as 'Small Fry', 'Yellow Plum', and 'Yellow Pear'. Red okra has a red bush, with red pods which turn brownish black. Of course, the savory herbs are both useful and decorative.

(5) Timely Topic for week of November 9-15.

Question

How can I protect my vegetable garden from frost in the event one is likely?

Reply

There are several preparations which one might take to reduce chances of losses from frost. Of course, there are many areas of south Florida where a killing frost is highly unlikely. First, plant cool-season hardy crops during frost-likely periods of the winter. Then, know something of the nature of frosts. It usually comes on cold, clear nights preceded by a day or two of clear skies. The idea is to conserve just a small fraction of the previous day's heat reaching the soil from the sun, and transferring it to the area of the plant at just the coldest time. One way is to keep the soil compact when there is danger of frost. Compact soil allows heat absorbed by the soil to move upward to heat the plant. Do not cultivate when frost is likely.
Loose soil acts as a barrier to heat moving up from the soil beneath. A mulch, such as pine straw or hay also keeps heat in the soil, leaving the air around the plant cold and subjecting the plant to frost injury. If you use straw or mulch, place it over the top of the plant to hold heat around the plant. A hotcap may be placed over the plant to hold heat around the plant. Also cloth may be placed over the plants in the night to hold back the heat. Keep the soil moist. Moisture not only adds heat to the soil, but to the air around the plant at the crucial time of lowest temperatures. Watering also helps compact the soil and adds heat holding capacity to the soil. It has been estimated that adding 10% moisture to the top six inches of soil increases the heat holding capacity by 50%. Finally, for just a few rows of plants still small enough, the gardener can cover with soil, being sure to scratch out the plants as soon as danger of frost has passed. There are commercial foams available which work as well as soil, but these are not in widespread usage at present.

(Stephens)

B. Know Your Vegetables - Comfrey

Cultivated comfrey (Symphytum peregrinum) is also called Russian comfrey, healing herb, blackwort, bruisewort, wallwort and gum plant. It is a hardy, herbaceous, perennial which grows four to five feet high. Leaves are five inches wide by twelve inches long, covered on the top surface by many short hairy bristles (mustard-like). The leaves appear to be stacked one upon the other, being larger at the base of the plant than near the top to form sort of a large clump. Comfrey has an oblong, fleshy, perennial root, black on the outside and whitish within, containing a clammy, tasteless juice. Drooping bell-flowers are white, purple or pale yellow.

Comfrey does well in Florida gardens, growing year round and tolerating cold weather. Since it is a perennial, it should be cut back yearly (January or February) to reduce the thatch and encourage new succulent leaf growth. Start comfrey any time of the year, although spring is best, using root or crown cuttings which are two to six inches long. Place them two to four inches deep in furrows spaced three feet apart. Comfrey may be eaten as a cooking green, used as an herb, or planted as an ornamental. Many medical remedies have been proclaimed for this plant.

(Stephens)