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Prepared by Extension Vegetable Crops Specialists
J. F. Kelly
Chairman
James Montelaro
Professor
J. M. Stephens
Associate Professor
S. R. Kostewicz
Assistant Professor
J. R. Hicks
Assistant Professor
R. K. Showalter
Professor

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

FROM: James Montelaro, Extension Vegetable Specialist

VEGETARIAN NEWSLETTER 75-3

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NOTE: Anyone is free to use the information in this newsletter. Whenever possible, please give credit to the authors.
I. NOTES OF INTEREST

A. Circular 196 Revised

The "Chemical Weed Control Guide for Vegetables" was revised recently and released for distribution. Shortage of printing funds limited us to 4,000 copies. Presently, about one-fourth of these remain for future use. We are asking County Agents to conserve their supply of this publication through careful distribution. Do not give it to anyone but those who are involved in some way in commercial vegetable production. Additional copies can be obtained from the limited reserve supply by letter explaining need.

(Montelaro)

B. Five Vegetable Field Days Planned

Center Directors at five branch stations have set dates for the Vegetable Field Days. They are as follows:

(1) ARC, Hastings - April 10, 1975
(2) AREC, Belle Glade - May 8, 1975
(3) AREC, Bradenton - May 21, 1975
(4) Main Station, Gainesville - June 3, 1975
(5) ARC, Leesburg - June 4, 1975

Those interested in attending Vegetable Field Days should place these dates on their calendar now. Announcements and press releases with more details will be sent our prior to each field day.

(Montelaro)

II. COMMERCIAL VEGETABLE PRODUCTION

A. "Mouse-ear" - A Disorder of Unknown Origin in Potatoes

A disorder referred to as "mouse-ear" is of rather common occurrence on potatoes growing in the Hastings area this season. This disorder is not new. It was seen by growers occasionally a decade or so ago. However, the disorder seems to be appearing more frequently and with more alarming symptoms with each passing year.

The research staff at the Hastings ARC has kept a close surveillance of the disorder. Presently, they are of the opinion that the condition has not reduced yields of potatoes in the area. However, some growers, especially those whose crops are most severely affected, feel that they may suffer yield losses this season.

The term mouse-ear describes the general appearance of leaves perfectly. Developing leaves in the bud of affected stems are much smaller than normal. In addition, affected leaves may show a browning or darkening of the margins. Affected buds exhibit an overall appearance which may be described as "rosetting." Bud leaves do not develop normally. They may develop a downward cropping and never attain full size.
Researchers at the Hastings ARC having checked and eliminated numerous leads are now looking into the possibility that mouse-ear may be caused by a nutritional unbalance. Presently, there is little cause for growers to become alarmed when mouse-ear is found in their potato crops. IFAS Research and Extension personnel will continue studying this problem in an attempt to determine (1) if the condition is a potentially serious problem which could reduce potato yields, (2) the nature and cause of the disorder, and (3) methods of preventing and/or correcting the problem.

(Montelaro)

B. Phosphorus Use Update

Faced with fertilizer shortages and high prices for two seasons, some vegetable growers have made adjustments which are helping them to keep costs down somewhat. The most important of these is the reduction in the total amount of phosphorus applied for vegetable crops. This is especially true on the sandy soils and some mucks heavily fertilized with phosphate materials in past years. Such soils, when analyzed, may show levels of 600 to 800 lbs. total phosphorus. Available phosphorus, by most methods used, is usually also in the high to very high range.

In our travels throughout Florida over the past two seasons, we checked with vegetable growers, county extension agents and fertilizer salesmen in an attempt to evaluate changes in fertilizer use. We were surprised to find many growers actually using soil test data to determine phosphorus needs for their crops. No grower reported poor plant response or yield loss from elimination or reduction in use of phosphorus.

Extension specialists are satisfied that the trend toward reduction in use of phosphorus will continue to expand. Growers, however, must not proceed recklessly. They must continue to monitor residual phosphorus in their soils, check the rate of drop in phosphate levels from year to year and to add it when it becomes necessary to do so. One other point of caution to growers is the possibility of temporary, but damaging, phosphorus deficiency in seedlings during cool periods even in soils showing high levels of available phosphates. Any crop, direct-seeded in late fall, winter and early spring, should receive a small amount of readily available phosphorus in the seed drill. One hundred pounds of plain superphosphate is more than ample provided it is placed in close proximity to the seed or transplant roots.

Growers should look at high levels of phosphorus accumulated in their soils as they would a bank savings account. Properly managed, it can last for years with only minimal outlays for phosphorus to compensate for temporary deficiencies which might develop in cold seasons.

(Montelaro)

C. Weed Control in Florida Watermelons

According to the Florida Crop and Livestock Reporting Service during the 1972-73 season, 54,700 acres were planted and in 1973-74 about 50,000 acres were planted, making it the second vegetable, by acreage, in the state. Watermelons are the most geographically widespread commercial vegetable crop in Florida. Production areas range from the early season melons of the Immokalee-South Florida area to the later marketed melons grown in the panhandle section of the state.
Weeds can be a serious problem in this crop with differences in the problem weeds varying widely by location. Many growers look to herbicides with the feeling that using one of these materials will totally eliminate weed problems. This is far from reality. Herbicides are only a single tool which can be used with others in the overall weed control program.

Nationally, six different materials are labeled for use on watermelons. However, an examination of the materials recommended in Florida (Extension Circular 196D) reveals only two materials. Why so few? There are several IFAS researchers that evaluate herbicides for watermelons in Florida and our recommendations are based on their research. They have shown that the other materials have exhibited crop damage when certain conditions common for Florida occur. While indeed the recommended materials can be crop toxic under certain conditions, they exhibit a greater margin of safety to the crop than some of the others. In addition, the weed control with these materials, while not perfect, is adequate. Some of the others have been poor.

The recommended materials are naptalam (Alanap, NPA) and bensulide (Prefar).

**Herbicides**

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Application</th>
<th>Rate</th>
<th>Incorporation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bensulide (Prefar)</td>
<td>Preplanting</td>
<td>5 to 6**</td>
<td>Incorporate 1 to 1 1/2 inches deep in moist soil. Plant immediately. The irrigation or rainfall method of incorporation with this material has not given adequate weed control.</td>
</tr>
<tr>
<td>Naptalam (Alanap, NPA)</td>
<td>Preemergence</td>
<td>3 to 4**</td>
<td>Incorporate of this material has given crop damage under conditions of leaching rainfall.</td>
</tr>
</tbody>
</table>

*The common name of the herbicide is followed by the trade name in parenthesis.

**NOTE:** The use of product trade names does not constitute a guarantee or warranty of the products named and does not signify approval to the exclusion of similar products.

**Rates are given on a broadcast basis. For band treatments, the rate will be reduced proportionately.

We suggest a banded, over-the-row application of either of these materials and use of cultivation to control weeds between the bands. Once the plants have established a good root system and begin to develop a canopy of foliage to shade out weeds, they are able to compete successfully with weeds that may be present thereafter. (Kostewicz)

D. Strawberry Nurseries in Florida

Strawberry acreage in Florida has dwindled over the years to the present fairly stable acreage. A number of factors have contributed to this decline. One of these problems is the need for source of high-quality plants to set in the fruiting field.

Historically, growers have produced their own plants in spring and summer nurseries. Because of production problems, more and more growers are purchasing their
plants from local and out-of-state specialized strawberry nurseries. During recent years, the number of Florida plant growers has decreased because of production and labor problems. Currently, only a few of these commercial strawberry plant nurseries remain.

The production problems seriously limiting strawberry plant production are probably disease susceptibility and poor runner production by those varieties currently recommended. Control of diseases, especially anthracnose, during the hot, rainy and humid weather during the summer is difficult with most fungicides. Development of strawberry varieties for Florida to overcome the disease problem has been underway for several years. Recently, the variety 'Florida Belle' was released from this program. This variety has shown the ability to produce abundant plants in spring and summer nurseries with a minimum of disease problems. We feel that commercial producers should grow this variety on a trial basis to determine if they can successfully produce their own plants. The supply of plants will be limited for a while until enough of them are produced to satisfy demands.

For growers who would like to attempt a small nursery, a limited supply of the plants can be obtained from the Florida Foundation Seed Producers, 213 Rolfs Hall, University of Florida, Gainesville, Florida, 32611. The following production guidelines should be followed:

(1) Select a clean well-drained site for the nursery.

(2) Treat the area with the recommended rate of a multi-purpose soil fumigant. These are discussed in Extension Circular 193, "Commercial Vegetable Insect, Disease and Nematode Control Guide."

(3) Following the proper waiting or aeration period for the fumigant, plant the beds. The beds must be unmulched so that the runner plants can establish root systems. Generally, a 5 to 6 foot bed can be used with one row per bed and an in-the-row plant spacing of 12 inches.

(4) Prepare the site and fertilize the beds at the rate of 500 to 600 pounds of 6-8-8 per acre. Sidedressing will be needed during the season especially after heavy rainfall. The sidedressing fertilizer applications should be in the range of about 15 lbs. of N and 15 lbs. of K2O per acre.

(5) Some provision should be made for controlling weeds in the beds. None of the currently recommended herbicides provide season-long control. However, a combination of herbicide plus mechanical weeding could be used. Herbicide recommendations are given in the "Strawberry Production Guide," Extension Circular 142. The need for control and the severity of the weed problem will depend upon the effectiveness of the multi-purpose fumigant (if used).

(6) An effective disease and insect control program is a requirement to produce clean plants. Using the recommended materials listed in Extension Circular 193 is a must even with the new 'Florida Belle' variety developed for Florida conditions.

For maximum production of plants from an initial supply, a spring and summer nursery is involved. Initially, the plants are set in the spring nursery about February to March. New runner plants are then reset in the summer nursery in June or July for production of plants for fruiting field. Using both a spring and summer nursery, 200 to 400 fold increase can be obtained.
A. Cooling Vegetables Before and During Shipment

Transit vehicle refrigeration units do not have the capacity for a quick cool down—which is imperative if quality is to be maintained at a high level. Practically all the vegetables produced in Florida that require temperatures around 32°F are precooled to remove field heat. On the other hand, vegetables which are sensitive to chilling very seldom receive any type of precooling and quite often are held at ambient temperatures until shipped. The thermostat on the trailer (or rail car) is then set for the desired temperature and the vehicle's refrigeration unit is expected to remove the accumulated heat. Even if the desired commodity temperature is reached before arrival at destination (quite often it is not), there are a number of problems which may be intensified by the very slow cooling rate resulting from such an operating procedure.

1) Respiration: Although it is a very complex process, postharvest respiration of vegetables can be described very simply as aging. Higher temperature means faster aging and more rapid deterioration of quality. In addition, the closer a commodity is to senescence (death) the more subject it is to decay and other disorders. There is also a possibility of rapid respiration at high temperature resulting in a depletion of oxygen and a buildup of carbon dioxide if ventilation is not adequate and/or the load is too tight.

2) Desiccation: Most vegetables are over 90% water. The rate at which a particular commodity will lose water depends on temperature, humidity, and rate of air movement. There is a direct relationship between temperature and water-holding capacity of the air. At the same relative humidity and air movement, vegetables stored at 80°F and 90% relative humidity will lose 2 to 3 times more water than if stored at 60°F. Refrigeration also has a drying effect on the atmosphere, particularly if the refrigeration unit is overloaded. Ideal conditions would prevail if there existed no more than 2°F difference between the temperature of the air coming from the refrigeration coils and the product temperature. While this is ideal, it would be extremely impractical to have that type of refrigeration capacity in a vehicle. Furthermore, if the commodity is at the proper temperature when loaded, the difference between air temperature and commodity temperature will be minimized. The real problems arise when there is a 30 to 40°F difference between the temperature of the vegetables and the thermostat setting. With the increased heat from respiration at higher temperatures, the problem of temperature reduction by an overloaded refrigeration unit is compounded. Air movement within the storage or vehicle is important. After the proper temperature is reached, the rate of air movement is not as critical, but it should be sufficient to remove the heat of respiration and circulate air to all parts of the load.

3) Decay: This is one sign of quality loss which everyone recognizes and about which there is no question. Temperature control will not substitute for packinghouse sanitation, but it does have tremendous influence on the growth of decay organisms. For example, the optimum temperature for bacterial soft rot development in peppers is 75°-85°F. This disorder is not completely stopped at temperatures of 45° to 50°F, but the rate of development is greatly curtailed.

Rapid cooling of vegetables is an important part of maintaining quality and preventing losses during marketing. This is true for commodities which are subject to chilling and those which are not. Transit vehicles are not precoolers. These
vehicles are built to maintain a temperature from shipping point to destination and this is all they should be expected to do. Shipping temperature (not thermostat setting) is a big factor in arrival condition.

(Hicks)

IV. VEGETABLE GARDENING

A. Timely Gardening Topics

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

(1) Timely Topic for week of March 16-22.

Question

I plan to use dry, bagged fertilizer mixture for my vegetable garden. How should I apply this for best results?

Reply

A satisfactory garden may result using any of several techniques for applying fertilizer. One technique is to scatter the fertilizer over the entire plot and work it into the soil by spading, chopping, raking, rototilling or plowing. This is the broadcast method; while effective, it is somewhat wasteful since some fertilizer ends up out of the root zone. Another technique is to broadcast the fertilizer in a swath about 2 feet wide down each row center, and then working the fertilizer into the soil. A third technique is to place the fertilizer in bands or furrows located on either side of the seed furrow.

Perhaps the best technique is a combination of broadcasting a portion and banding the rest at planting time. Either of the two broadcast methods may be used.

As the garden grows, additional fertilizer needs to be applied at approximately two-week intervals. Such applications are called sidedressings since the fertilizer is placed to the side of the plants and at the edge of the root zone.

(2) Timely Topic for week of March 23-29.

Question

One of my neighbors suggested I pile hay around the base of my potato plants to make harvesting easier. Will this work?

Reply

When hay is placed around the base of a potato plant, tubers are formed not only in the soil below the hay, but along the stem in the hay. Thus, tubers located in the hay would tend to be cleaner, somewhat more free from soil-borne disease blemishes, and a bit easier to dig. Keep in mind that a potato is not a root, but is a swollen portion of the stem called a tuber. Such tubers, although smaller, will arise on any part of the stem covered with hay, soil or other similar materials. Those exposed to light will be green.
(3) Timely Topic for week of March 30-April 5.

Question

How long can I expect the garden seeds I have stored in a sealed jar to remain good?

Reply

The life span of seeds varies from a few weeks to several hundred years, depending upon the kind of plant and how they are stored. Most vegetable seeds will last from three to fifteen years if properly stored. Seeds stored in a cool, dry place will live the longest. Getting seeds wet and warm brings about some changes in them. They germinate, which means they have started to grow. This growth requires the use of energy. Likewise, moisture and warmth cause stored seeds to use up their energy, and they become weak and even die. Vegetable seeds, in general, will last longest if stored at about 50°F and fairly dry (50 to 70 percent relative humidity). Seeds of some vegetables tend to live longer than seeds of other vegetables. The following groupings can generally be made.

<table>
<thead>
<tr>
<th>Group A (Short-lived)</th>
<th>Group B (Medium-lived)</th>
<th>Group C (Long-lived)</th>
</tr>
</thead>
<tbody>
<tr>
<td>onion</td>
<td>beans</td>
<td>cucumbers</td>
</tr>
<tr>
<td>corn</td>
<td>carrots</td>
<td>turnips</td>
</tr>
<tr>
<td>okra</td>
<td>peas</td>
<td>watermelon</td>
</tr>
<tr>
<td>parsnip</td>
<td>tomato</td>
<td>eggplant</td>
</tr>
</tbody>
</table>

(4) Timely Topic for week of April 6-12.

Question

What could be causing the leaves on many of my garden vegetable plants to turn brown along the edges?

Reply

Such leaf symptoms usually indicate some form of root injury, quite often caused by too heavy amounts of fertilizer applied in or near the root zone. This injury usually results in browning and die-back of the ends and margins of the leaves. Other possible causes of leaf margin browning are root injury due to nematodes, insects, overwatering, or diseases, physical injury to roots due to cultivation, severe potash deficiency, physical leaf burn due to toxic substances on leaves, and an unusual leaf spotting disease pattern.

(5) Timely Topic for week of April 13-19.

Question

I intend to have a small hydroponic unit for my science fair. How do I insure the plants are getting enough air for good growth?

Reply

Leave about one inch of air space between the planting litter and the solution for young plants. As plants grow, allow 2 or 3 inches below the litter. Oxygen
supply may be further insured by pumping air through the solution with a pump (an aquarium pump works well for several containers), compressed air, or other equipment. Bubbles should be spaced 1/2 to 1 inch apart as they rise through the solution.

(Stephens)

B. Know Your Vegetables - Globe Artichokes

The globe artichoke (Cynara scolymus) is also known as French artichoke and green artichoke. It should not be confused with the Jerusalem artichoke.

Globe artichokes are perennial, thistle-like plants whose flower buds are the edible parts. The silvery green plants are 4 to 5 feet tall and spread outward 5 to 6 feet. The flower buds arise on the terminal portion of the main stem and on lateral stems. Each unopened flower bud resembles a pine cone, being deep green in color, three to four inches in diameter, round, but slightly elongated. Several pointed, leathery green bracts fold around a purple-blue flower. The base of each bract is fleshy, and is the edible portion, along with the young flower and the fleshy center of the artichoke on which the flower and bracts are borne. Buds that are left on the plant open to a 6-inch purple blue flower. Sometimes these are dried and used in floral arrangements.

Almost all of the nation's globe artichokes are grown in a narrow coastal area in California because of the especially favorable climate. It is not well adapted to Florida's climate as it does best in a frost-free area with cool, foggy summers. It will not grow in areas having deep ground freeze. Hot weather causes the buds to open quickly and destroys the tenderness of the edible parts. However, some gardeners try their hand at producing them here just for the fun of it.

A variety called 'Green Globe' is usually grown. It is not grown from seed, as it does not grow true from seed and resembles more a thistle plant. Instead, portions of old plants are planted, usually from either the rootstalk or root shoots. Early in the spring, the sprouts, or root parts, are set 6 to 8 inches deep, 6 feet apart in rows 8 feet wide. Fertilize, irrigate and cultivate them first as you would the other vegetables in your garden.

Finding suitable planting material is one of the reasons Florida gardeners are unable to try this crop. Again, since it is not well adapted here, not much success should be expected.

(Stephens)