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Prepared by Extension Vegetable Crops Specialist

J. F. Kelly
Chairman

R. D. William
Assistant Professor

J. M. Stephens
Associate Professor

G. A. Marlowe, Jr.
Professor

M. E. Marvel
Professor

James Montelaro
Professor

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

FROM: J. M. Stephens, Associate Professor and Extension Vegetable Specialist

VEGETARIAN NEWSLETTER 78-1

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I. NOTES OF INTEREST

A. New Vegetable Fact Sheets Available

The following fact sheets developed by vegetable crops staff have just been released and may be ordered from Publication Distribution Center, IFAS Receiving, Building 664, University of Florida.

1. VC 9-77, "Strawberries in the Florida Home Garden."
2. VC 10-77, "Grow Your Own Vegetables Without Soil."
3. VC 11-77, "Cucumbers in the Florida Garden."
4. VC 12-77, "Nutsedge Suppression in Commercial Vegetables."

(Stephens)

II. COMMERCIAL VEGETABLE PRODUCTION

A. Field Sanitation – A Must in Vegetable Production

Commercial vegetable production in Florida is a high-risk business subject to the hazards of frost, freeze, rain, market gluts, etc. Why then should growers gamble unnecessarily on potential hazards which can be avoided with little effort and cost? The most common problem noted year in and year out is the one created by abandoned crops. Last season, a tomato grower failed to destroy his spring crop until two weeks before planting a fall crop. A multi-purpose soil fumigant costing about $200.00 per acre failed to control nematodes. The crop was for all practical purposes a total failure. Similar situations occur every season.

Many of the problems created by old, abandoned crops are not quite so obvious as in the case with failure to control nematodes. Nevertheless, the potential is there and in all probability they contribute significantly to outbreaks of certain insects and diseases. Research and field observations point to many more problems in vegetable production which can be associated in some way with poor sanitation practices on the farm. These include: (1) virus diseases in lettuce, watermelon, squash, etc., (2) pinworm on tomatoes, (3) bacterial basal ear-rot on sweet corn, and (4) blackrot in cabbage.

Good sanitation not only includes prompt destruction of abandoned crops, but destruction of pest-harboring weeds, packinghouse wastes and volunteer plants around greenhouses, border areas and ditchbanks. Fields of tomatoes and eggplants left abandoned with nightshade weeds growing unabated in them and the surrounding area are certain to cause disease problems for subsequent crops grown in the vicinity. Field sanitation is important, therefore, even on leased land which may not be cropped by the same grower the following season.

The common practices discussed above are not expensive to carry out. Properly done they can return many times their cost from savings in pest control and increased yields in subsequent crops. With all production costs rising rapidly growers no longer can afford to disregard the simple and inexpensive practices of field sanitation in production of vegetable crops.

(Montelaro)
B. Producing and Marketing Quality Vegetables from Small Farms Production

Small farmers (and some growers with large acreages) are seeking information about growing and marketing vegetables in North Florida. Often, the first question is; "Where can I sell my produce?" Previous issues of the Vegetarian Newsletter (75-8, 77-9) have described imaginative marketing options used by some growers for specialty crop production. However, an often overlooked fact is that a national market already exists for many vegetables that enter the market in large volume. Therefore, new growers or growing areas must successfully compete in the national market, usually by taking the production away from another production area. Successful competition in the national market may include: (1) producing and selling at a lower per unit production cost, (2) producing superior quality produce, or (3) having a marketing advantage such as proximity to population centers or being able to fill mixed truckload orders, and others.

In early December, a vegetable production and marketing meeting was organized at the Thomasville Farmer's Market in cooperation with the Georgia Department of Agriculture Marketing Division and the Georgia and Florida Cooperative Extension Services. In this and future issues of the Newsletter, key production and marketing points resulting from that meeting will be summarized.

This issue's summarization involves a "Guide for Growers" prepared by James Barber, Georgia Extension Horticulturist at Tifton, and Ray William, IFAS. Perhaps county agents will want to duplicate it for use by growers.

Future articles will summarize cost of production; market competition and volume; price variability and trends; seasonal patterns and consumption patterns. In addition, a list of vegetables sold at the Thomasville Market will be included.

A Grower Guide to Producing Quality Vegetables

1. Quality vegetable production begins with planning. Consider:
   a. Land or field selection.
   b. Previous crop rotation.
   c. Correct timing of cultural practices, etc.

2. Prepare land by:
   a. Plowing early to cover up crop or weed trash and to loosen soil.
   b. Avoiding a compacted subsoil in North Florida soils. Repeated harrowing or discing and a mold-board plow will create a hard pan. You can break the hard pan by plowing just below the hard pan every year.

3. Test soil to determine fertilizer and lime requirements.
   a. Lime soil to:
      1. Raise pH value to 6.0 to 6.5 for most vegetables.
   b. Fertilize soil according to recommendations in Extension Production Guides for each crop. Consider fertilizer placement, sources and rates.
c. Add micronutrients to new land or to supplement old fields.

4. Control nematodes by:
   a. Rotating susceptible crops.
   b. Plowing under plant debris several weeks before nematicide application to allow for complete decay of roots so that nematodes are exposed to the chemical nematicide.
   c. Correct timing and application of nematicide including covering or sealing to retain proper concentration in soil. Aerate before planting crop.
   d. Selecting resistant varieties.

5. Plant good seed or transplants.
   a. Select a variety that:
      1. Produces high yields,
      2. Buyer or market prefers. Don't substitute another variety unless you know that the buyers want it.
   b. Buy quality seed or certified, pest-free transplants.
   c. Follow recommended plant spacings, densities, etc. for the variety that you choose.

6. Control plant pests by:
   a. Planning entire weed control program including:
      1. Timing of cultivations and type of equipment.
      2. Proper timing and application of an herbicide.
   b. Identifying insects or diseases before application of pesticide.
   c. Determine proper control measure for pest. Apply control measure carefully to cover the crop foliage completely.

7. Irrigate crops when needed, rather than gambling on rainfall percentages. Most vegetables prefer a uniform supply of water. Drain excess rainfall as rapidly as possible.

8. Sidedress fertilizer according to the recommended practices in the Vegetable Production Guides. Following periods of cool weather or excessive rainfall, sidedress nitrate nitrogen.

9. Pollinate cucurbit crops with one hive of honey bees per 1 or 2 acres of crop. Apply pesticides carefully to avoid killing bees.

10. Harvest crops at correct maturity for each crop. Discard all culls and grade according to market standards. Handle the vegetables carefully.

11. Pack clean vegetables in clean crates or hampers of the correct size and shape for that vegetable. Ask the market manager or buyer about details. REMEMBER, ATTRACTIVE AND APPEALING PRODUCE ALWAYS SELLS BETTER THAN BRUISED OR POOR QUALITY PRODUCE.
12. Move the vegetables to market soon after harvesting. Keep vegetables in the shade. To reduce postharvest losses caused by excess heat or decay, avoid large piles or leaving vegetables packed tightly.

(William)

C. Some Symptoms of Seedling Plant Disorders

Spring-planted vegetables grown from seedlings set into the field are being planned for, or will be started within the next few weeks. Transplant production is a challenging, rewarding, and important responsibility. Much of the success of the crop depends on the vigor, health, and condition of transplant used.

Most of the technology of seedling plant production is based on daily watchfulness, common sense action, and tender loving care. In spite of the best intentions of the plant grower, however, things do go wrong! Some of these problems are due to plant diseases, nematodes, or insects, but a great many other problems are related to non-pest causes.

During the past twenty years the writer has made a collection of symptoms related to physiological, cultural, and environment-related disorders of seedlings. This brief listing may be of help to plant growers, extension agents, and field men who may be faced with diagnostic situations in seedling problems. This list does not cover pest (organism) induced problems. The reader may also find some omissions; if so, let us know so we may add them to this list. We hope that this list will at least serve as a starting point in the problem-solving process.

1. Problems related to entire seedling:

   a. Poor germination
      Excess heat or cold temperature
      Excess or inadequate soil moisture
      Excess soluble salts
      Damaged seed (age, poor storage, injury)
      Fumigant injury
      Herbicide injury

   b. Uneven growth of seedlings
      Excess of deficit of soil moisture
      Excess fertilizer salts
      Early, severe nutrient deficiencies
      Dry areas in flat or bed
      Poor mixing of media and fertilizer
      Uneven fertilizer application

   c. Slow growth of seedlings
      Low temperature
      Inadequate nutrition, N & P low
      Low soil moisture
      Poor root aeration

   d. Stunted, erratic growth
      Deficiency of N, P, Mg, or calcium
      Excess ammonium fertilizer
      Poor root system, rot or damage
      Excess light
      Low soil moisture
      Herbicide or air pollution injury
e. Wilting of seedlings
Inadequate moisture supply
Excess temperature
When media wet, possible soluble salt injury
Root injury

f. Tall spindly growth
High temperature plus low light
High nitrogen nutrition
Excess moisture

g. Unfavorable root to top ratio
Excess soil moisture: larger tops, smaller root growth
Root growth increases with decreases in soil moisture (above wilting)

2. Problems related primarily to leaves:

a. Premature cotyledon drop
Low light or shading
Excess water
Poor root aeration
Deficiency of phosphorus
Excess nitrogen

b. Premature leaf fall
Overwatering
Poor aeration
Air pollution

c. Reduced leaf size
Low light plus high temperature
Poor aeration, tight soil mix
Excess of potassium fertilizer

d. Yellowning of leaves
Low nitrogen
Excess soluble salts
Poor root aeration
Excess or deficient moisture
Root injury
Media pH (too low or too high)
Low temperature
Chemical injury (fumes or herbicides)

e. Dark green leaf color
Excess N or K fertilizer

f. Speckling of leaves
Pesticide damage (sprays or dusts)
Air pollution injury

g. Purpling of leaves
Low temperature
Deficiency of phosphorus

h. Marginal leaf tip burn
Excess fertilizer salts
Erratic moisture supply
Air pollution

i. Marginal cupping of leaves
Downward curling: Def. of calcium
Excess boron fertilizer
Gas combustion toxicants

3. Problems related primarily to stems:

a. Hard, brittle stems
Excess K fertilizer
High temperature plus high light
Deficiency of Ca or Mg

b. Lesions on stem
Excess ammonium nitrogen
Excess soluble salts (soil line)

4. Problems related primarily to roots:

a. Roots discolored
Root decay due to chilling
Calcium deficiency
Light brown and thin, low P

b. Root growth retarded, not discolored
Phosphorus deficiency
Short, many branches, calcium deficiency
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b. Root growth retarded, not discolored
(con't)

Low temperature (below 57°F)
Poor soil aeration
Short, stubby, magnesium deficiency
Low nitrogen

c. Root symptoms associated with nutrient
excesses

Roots white and stubby, excess Mg, water shading
Roots dark brown, excess K
Excessively long, few branches, excess Ca
Roots light brown, thin, excess N

5. Brief overview of nutrient deficiency symptoms

a. Whole plant or older leaves

1. Whole plant

Stunted, slender, yellow, leaves hold.....N
Stunted, purpling, dark, leaves drop.....P

2. Older leaves

Leaf tip, margins necrotic, leaves fall.....K
Leaf margins pucker, between veins necrotic.....Mg

b. New growth

1. Terminal alive

Chlorosis between veins, veins green.....Fe
Necrotic checkering, veins green.....Mn
Leaves light green, spotting veins pale.....S
Leaf tip withers, without chlorosis.....Cu

2. Terminal dies

Tip necrosis, leaves hooked, root brown.....Ca
Leaf base dies, leaves brittle, roots brown.....B

Diagnosis of plant problems is often more art than science. A careful look at the total field or greenhouse operation should come first. What general trends are present? Is the problem restricted to certain areas? Moving from the general to the specific (or the specific to the overall situation) in a methodical way prevents overlooking valuable clues. The above list would be most helpful after the decision is made that the problem is most likely not pest related.

Problems are seldom simple. Many times symptoms are expressed from several interacting causes, at which time one realizes that the situation doesn't fit any of the nice little words in a written description.

(Marlowe)
III. VEGETABLE GARDENING

A. Waxing Garden Produce

Most everyone knows that the best way to keep vegetables fresh is to keep them cool. But where does the home gardener ever find enough refrigerator space for an abundant harvest? Other techniques for improving storage life have to be sought out. Waxing of certain vegetables is one possibility.

Waxing of fruits and vegetables has been done on a commercial basis for a long time. In fact, the Chinese experimented with molten wax dips for oranges and lemons way back in the 12th and 13th centuries. Even today, it is rare to find a rutabaga in the food market that is not heavily waxed.

Horticultural crops are waxed for a variety of reasons, but mostly to prevent wilting, shriveling and general shrinkage due to water loss. Some produce is waxed to improve appearance, giving it a shiny, natural look. Others are coated in an attempt to reduce decay, sprouting, or other aging processes. For still other fruits and vegetables, a wax coating may serve as a lubricant to reduce scarring and chaffing during marketing. A coloring agent is sometimes included in the waxing process.

Not all vegetables are suitable for waxing. Those most commonly waxed include tomato, pepper, cantaloupe, cucumber, rutabaga, and parsnips. Sometimes waxed to a lesser extent are turnip, carrot, eggplant, summer squash, winter squash, potato and sweet potato.

Several methods of applying wax have been used, all with varying degrees of success, since products vary so much in surface texture. Methods include dipping products into cold wax emulsions, dipping into hot wax emulsions, spraying wax, and using brushes to coat wet or solid wax onto the product.

In commercial practice, several types of waxes have been used, either alone or in mixtures such as water and wax. Commonly used waxes are paraffin, beeswax, and carnauba wax. Carnuba is a hard vegetable wax obtained from the surface of a Brazilian palm tree. Paraffin wax is commonly used in the manufacture of candles.

Home gardeners wishing to try home waxing a few vegetables for longer lasting effects should start out with paraffin wax. It is available in most local grocery and general merchandise stores. Other forms of wax are more difficult to find.

With pure refined paraffin wax, about 2 to 5 percent mineral oil, vaseline, or beeswax should be added to keep the mixture from drying too brittle. Also, add a pinch (1 to 2%) of rosin to make the wax sticky. When melted, paraffin provides a fairly thick film coating of wax.

The product, say for example rutabaga roots, should be washed and dried thoroughly. Melt the wax mixture as described, then dip each root into the wax for one second. About one pound (450 grams) of paraffin is needed per bushel of rutabaga roots. This sort of waxing will result in a dull finish, but should reduce shrinkage.

(Stephens and Marvel)
B. Substituting for Nemagon

Now that DBCP (Nemagon & Fumazone) is no longer available, home vegetable gardeners will be looking for other materials to control nematodes. Fortunately, there are other chemicals available which will do a good job of ridding the soil of these troublesome pests. Most of the ones to be found in Florida garden supply stores are listed in the following table:

<table>
<thead>
<tr>
<th>Fumigant</th>
<th>Trade Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene dibromide (EDB)</td>
<td>Dowfume W-85 and Soilbrom</td>
</tr>
<tr>
<td>Dichloropropanes—Dichloropropanes</td>
<td>D-D, Vidden D, and Telone</td>
</tr>
<tr>
<td>Sodium N-methyl dithiocarbamate (SMDC)</td>
<td>Vapam, VPM, and Fume V</td>
</tr>
<tr>
<td>Chlorinated hydrocarbons + methyl isothiocyanate</td>
<td>Vorlex</td>
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All of these materials may be applied to the soil in much the same manner. Briefly, here's how.

First, prepare the soil so that it is in seed-bed condition. Then, open a furrow 6 inches deep down each row center, or at 12-inch intervals. A quart jar with two holes in the lid is a simple device for applying the liquid chemicals. Pour into the jar the amount of chemical required to treat 100 feet of row. Read the label to determine how much to apply. Walking at a steady pace, dribble the liquid into the furrow; cover and tamp with a rake; then sprinkle the soil surface with a garden hose. Note: When using Vorlex or Vapam, covering the treated area with a 2-foot wide strip of plastic will greatly increase the effectiveness of these all-purpose fumigants. Allow two weeks for aeration after removal of the plastic before planting.

(Stephens)

C. Know Your Vegetables — Purslane

Purslane (Portulaca oleracea L.) is another of the commonly found weed plants in Florida that are eaten occasionally as a vegetable, although it is not grown in gardens or collected as frequently as pokeweed and amaranthus pigweed. Its name derives from the Latin portulaca through the old French pourcelaine. It should not be confused with a different common weed Florida purslane or Florida pusley (Richardia scabra). However, purslane is often called by other names such as pusley, pussly, kitchen purslane, garden purslane, and fatweed.
Indeed, fatweed may be the best name for the vegetable weed, since the leaves and stems are so fleshy and succulent. Common purslane is a summer annual with smooth purplish red prostrate stems arising from a single tap root. The small oval juicy leaves are clustered at the ends of the branches. Small yellow leaves are formed in the leaf axils. Cultivated forms are more upright and vigorous than those growing in the wild.

Whole young plants, and especially young leaves and tender stem tips can be used as a pot-herb, or raw in salads. The taste is similar to watercress or spinach. Protein content is 2 to 2.5%. Seeds have been eaten also, either raw or ground and made into bread.

Purslane is a native of Persia where it was used over 2000 years ago. It was introduced into the U.S. from Southern Europe. Now it is most abundant in the Eastern States, including Florida, and least commonly in the Pacific Northwest.

Purslane reproduces from seeds and stem fragments. The tiny seeds are nearly oval, wrinkled, and black with a whitish scar at one end. When planted in the spring, the plant flowers and fruits about May and June. It is a tender plant susceptible to frost injury. Whereas wild forms are plentiful throughout Florida, seeds of cultivated varieties of purslane are seldom listed in most vegetable seed catalogs. French seed houses are reported to list purslane varieties.

(Stephens)