The VEGETARIAN Newsletter

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

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VEGETARIAN NEWSLETTER 72-12

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I. COMMERCIAL VEGETABLE PRODUCTION

A. "Good Seed" - A Partial Solution to Blackeye Cowpea Mosaic Virus Control in Florida

A major problem in the production of southern peas (cowpeas) in Florida is seed-borne viruses—-one of the most serious of which is blackeye cowpea mosaic virus (CV). Plants from blackeye cowpea mosaic virus-infected seed may show symptoms of the disease quite early in their development. The disease can be spread readily by insect vectors to the entire planting which often results in total crop failure.

In a recent paper presented to the Florida State Horticultural Society, Dr. F. W. Zettler and Dr. I. R. Evans reported results of studies that offer excellent promise for the control of this disease. They found that incidence of blackeye cowpea mosaic virus in seed was directly related to seed source. Of four test lots of seed produced in Florida and Georgia, 13 to 30 percent of the seed were infected by blackeye cowpea mosaic virus. On the other hand, two seed lots from Oklahoma and one lot from Texas were free of the virus. All seven lots were of the "Knuckle Purple Hull" variety. Seed of several other varieties grown in Oklahoma, Texas and California were also found to be free of blackeye cowpea mosaic virus.

The authors point out that western-grown seed has been reported in the past to contain blackeye cowpea mosaic virus. Likewise, seed grown in the southeast can be virus free on occasions. However, if growers purchase western-grown, certified southern pea seed for planting, they reduce the risk of serious outbreaks from this disease considerably. Growers may not be able to obtain this type of seed for all varieties, but when available it should be planted.

(Montelaro)

B. Internal Discoloration and Breakdown in Tissue of Eggplant Fruits

For the past three years, extension vegetable specialists and county extension agents have been studying the problem of internal breakdown and discoloration in eggplants. It was first observed in Madison County, but was later found to be a serious problem in some plantings in Hillsborough and Collier Counties. Dr. R. S. Mullin, Extension Plant Pathologist, has examined tissue and has been unable to isolate pathogens. Based on this information and other preliminary investigations, we feel that the condition is a "disorder" related to the physiology of the plant.

The disorder is characterized by slight depressions of various sizes on the surface of the fruit. In the early stages, the skin of the fruit may not be broken. When the fruit is cut crosswise or lengthwise, discolored tissue may be found internally in other isolated areas of the fruit. Fruit of this type is not marketable.

From our preliminary observations, we feel that it may be associated with a calcium-boron unbalance in the plant. An affected planting of eggplants was sprayed with calcium and boron. The grower and county agent involved reported a significant improvement in the fruits harvested subsequently. This observation is not conclusive as there were no unsprayed checks for comparison. This lead is now being investigated in our laboratories at Gainesville.
There appear to be differences among varieties in susceptibility to the disorder. This aspect and others need to be studied more closely. We are asking our county agents to be on the lookout for this problem and to report to us if they suspect it to be present in their county.

Anyone interested in internal discoloration of eggplants is referred to the August 5, 1971 issue of the Vegetarian Newsletter for an article entitled "Production of Quality Eggplants." In this article, we outlined suggestions which should be followed in order to try to avoid the problem discussed here. To the suggestions made in the article, we might add special emphasis on (1) liming and calcium levels, and (2) minor elements to be certain of our adequate supply of boron.

(Montelaro)

C. Weed Control in Sweet Potatoes

The sweet potato is a crop requiring a long warm growing season. It is native to the tropics, but is grown in the southeastern part of the United States with a great deal of success. As a rule of thumb, 120 to 150 warm days and nights are required to mature a crop once it has been transplanted to the production field. This length of time will vary according to the influence of many factors such as variety, season and production problems.

Weeds compete with crops for soil moisture and nutrients and in this manner can hinder optimum growth of the crop if weed populations are allowed to go unchecked. In addition to the competitive effects, many species of weeds in a long season regime can complete their reproductive cycle and produce an enormous quantity of seeds. Thus, over a period of years, the weed problem can be self-compounding to the extent that the seriousness increases with time.

The sweet potato by nature of its growth habit tends to help alleviate weed pressures to a certain degree. The sweet potato produces a dense luxuriant canopy of foliage as the plants develop. In this manner, the foliage of the crop is able to "shade out" many of the newly germinating, young or low growing weeds that occur during that time. However, many older, taller or more vigorously growing weeds may not be greatly affected and may continue to be competitive. There are also weeds which generally do not appear until late in the season and can be a serious problem when and where they occur.

A "critical" period of weed control is the time between transplanting of the crop to the field and when the vines meet in the middles and a vigorous canopy of foliage is developed. Weed competition is especially undesirable when the transplants are becoming established in the field. Mechanical cultivation and herbicides are valuable tools in the grower's arsenal to combat weeds. The most desirable herbicide would, of course, be one in which a simple preplant or post-transplant application would give complete season long weed control under a wide range of conditions and locations. This level of sophistication has not yet been achieved.

The listing of herbicides below gives those which are currently suggested for use in sweet potatoes. The materials and rates are suggested for trial on a limited basis by interested growers. Research with herbicides in many areas has
shown varying degrees of success with the variations in climate, soil, and application procedures exerting effects on a year-to-year basis. Only through a limited scale trial evaluation can the grower obtain the experience and confidence with the various materials, usage and application techniques, weed specificity, timing, combination of techniques, etc., that will enable him to develop a good weed control program for his operation.

Suggested Herbicides for Sweet Potatoes for Use on a Trial Basis by Florida Growers

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Time of Application to Crop</th>
<th>Lbs./Acre (Active Ingredient)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCPA (Dacthal)</td>
<td>Pretransplant</td>
<td>10.5</td>
<td>Broadcast soil application at time of transplanting.</td>
</tr>
<tr>
<td>vernolate (Vernam)</td>
<td>Pretransplant</td>
<td>1.5 to 2</td>
<td>Needs to be soil incorporated. Rate depends on type of bed preparation. (Consult label.)</td>
</tr>
<tr>
<td>diphenamid (Dymid) (Enide)</td>
<td>Post-transplant</td>
<td>4</td>
<td>Apply overtop immediately after transplanting. Do not plant treated areas to crops not on the label within 6 months after treatments.</td>
</tr>
<tr>
<td>DCPA (Dacthal)</td>
<td>Post-transplant</td>
<td>10.5</td>
<td>Broadcast soil application at time of last cultivation (lay-by, up to 6 weeks after transplanting.)</td>
</tr>
</tbody>
</table>

D. Greenhouse Tomato Production for Florida - Some Points for Consideration

The art and/or science of cultivating plants under modified conditions in specialized growing structures to overcome undesirable climatic conditions has been in existence for many years. A century or two ago, European market gardeners used individual plant covers to protect plants set out very early from frosts and cold weather. From this commercial application of a protective principle, cold frames, hot beds, and eventually greenhouses appeared in commercial production of fresh vegetables for market.

Much of the success with greenhouse production can be attributed to the production of commodities for an early market, or at times when they are not readily available from other sources or areas. In earlier years in the United States, greenhouse production of tomatoes was for the most part the only source of fresh tomatoes during the winter months in the northern areas of the country. As transportation facilities and production practices improved, tomatoes from southern areas of the United States, and more recently imports have made inroads into the northern markets during the winter months. While the competition picture has changed for northern greenhouse growers from what it had been in
earlier years, efficient greenhouse growers remain well established in their areas and will remain so as long as high quality and low cost of production can be maintained.

Some interest has been expressed in northern areas of Florida for production of tomatoes in glass or plastic covered greenhouses. Let us briefly look at some important points to consider when analyzing this type of culture.

A. Initial Investment

1. Glass - Well in excess of $100,000 per acre for the physical facilities alone. This size investment not practical if it is to be used only a few months of the year.

2. Plastic Covered Houses - Considerably less expensive than glass depending upon what materials the grower already has. Plastic materials need replacing every 1-4 years depending on type of material.

B. Production Costs

Many greenhouse production areas operate in the range of 30 to 40 thousand dollars per acre for production costs (20 to 25¢ per pound). Even if cut in half, we are still speaking of a great deal of operating capital. Perhaps the largest contributor to this expense is labor.

C. Aspects involved which require high-labor inputs.

1. Transplant production - seeding, transplanting to pots, setting in ground beds. A great many of the steps can be mechanized, but this calls for additional investment outlay.

2. Tying plants to vertical support strings. Done periodically as the plant grows in height.

3. Pruning. Removal of laterals to keep plants to a single stem. This practice is done several times a week.

4. Pollination. Tomatoes are normally self-pollinated. Under field conditions, the wind "shakes" the flower clusters with sufficient force to effect pollen release and transfer resulting in normal pollination. Thus, mechanical vibration of each flower cluster must be done to help achieve pollination. This practice is done every day.

5. Harvesting. Fruit are removed by cutting the fruit stem. This puts less physical strain on the plant than pulling fruit off, i.e. less potential for plant breakage. Greenhouse tomatoes traditionally have been marketed with the calyx and small portion of stem attached to the fruit.

Many cultural practices such as fertilization, soil preparation, and disease and insect control are similar to outdoor production. However, under the modified or optimum conditions that exist, diseases and insects can be more serious and rapid spreading problems than encountered in the field.
Under Florida conditions of high temperatures during the late spring, summer and early fall, greenhouse production of tomatoes is out of the picture. A method of cooling the houses during the high temperature periods would be a necessity to insure fruit set (see Vegetarian 72-10 "Fruit Set in Tomatoes"). The cost of doing this would be prohibitive. Production in the northern areas of Florida during the winter months is a possibility from the standpoint of being able to supply heat to protect the plants from the cold weather at a reasonable cost.

Management is a key to the success of many enterprises, and in greenhouse production it is even more critical. An important consideration is, of course, maintaining costs as low as possible, but the day-to-day cultural aspects related to the actual growing of the crop are of equal importance. Light is the only production factor related to plant growth over which the greenhouse operator has little, if any, control. The others such as temperature, moisture, humidity and air movement can be manipulated. The operator must know why they are important, how they are interrelated, and how they should be coordinated. Thus, in a sense he must be part scientist, part artist, and part technician in addition to being a businessman.

Thus, while it is correct to say that there are similarities between "indoor" and outdoor production of tomatoes, it is the extent and importance of the differences that must be considered also. In addition to the production considerations, one must evaluate the marketing situation as well. Once the tomatoes are produced, can they be sold at a profit? Is there a need and what is the competition?

Detailed information in the form of extension bulletins and circulars is available from many of the northern states that have significant greenhouse tomato industries. A good starting source of information for persons interested in such operations is a publication available from the USDA--"Commercial Production of Greenhouse Tomatoes," Agriculture Handbook No. 382, available for 30¢ from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.

(Kostewicz)
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II. VEGETABLE GARDENING

A. Seeds and Plants - A 4-H Special Interest Project

Most of us should be aware that Florida is trying to boost 4-H enrollment and reach an expanding urban audience through what have been labeled Special Interest projects. These projects are designed to be taught in the school classroom by the teacher. One such project which has met with limited success in at least one county is Seeds and Plants. Between 2,500 and 3,000 fifth graders enrolled in the project in one county alone.

The Seeds and Plants project consists of 8 exercises, each of which may be conducted in a 45-minute session and observed in a later session. The 8 exercises offer 6 hours of instruction over a period of about 7 to 8 weeks.

Each exercise is written up as a teaching guide (a member piece for each exercise is planned but not yet in print). Each teaching guide gives (a) the purpose, (b) background information, (c) how to proceed, (d) materials needed, (e) time considerations, and (f) how to evaluate.

Here is a brief outline of the 8 exercises. (Note: The page numbered SI 20.0 is a table of contents page outlining the exercises).

<table>
<thead>
<tr>
<th>Exercise No.</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI 20.1</td>
<td>&quot;Introducing a Seed&quot;</td>
<td>Soak a bean seed, examine its structure.</td>
</tr>
<tr>
<td>SI 20.2</td>
<td>&quot;Watching Seed Sprout&quot;</td>
<td>Place seeds between side of clear cup and wet towel and observe germination.</td>
</tr>
<tr>
<td>SI 20.3</td>
<td>&quot;Testing Seed Germination&quot;</td>
<td>Place a given number of seeds in a paper towel (rag doll) and count the percentage germination.</td>
</tr>
<tr>
<td>SI 20.4</td>
<td>&quot;How Age Affects Seeds&quot;</td>
<td>Test old seeds and new seeds in a rag doll.</td>
</tr>
<tr>
<td>SI 20.5</td>
<td>&quot;Planting a Seed in a Peat Pellet&quot;</td>
<td>Enlarge a peat pellet, plant a tomato seed.</td>
</tr>
<tr>
<td>SI 20.6</td>
<td>&quot;Plants and Fertilizer&quot;</td>
<td>Plant seed in a fertilized sand and a non-fertilized sand.</td>
</tr>
<tr>
<td>SI 20.7</td>
<td>&quot;Depth of Seeding&quot;</td>
<td>Plant seed at different depths in cups of sand and observe.</td>
</tr>
<tr>
<td>SI 20.8</td>
<td>&quot;Light and Plants&quot;</td>
<td>Place the peat pellet plants in sunlight and in darkness—note plant response.</td>
</tr>
</tbody>
</table>
B. Know Your Vegetables - Rutabaga

Rutabagas are also referred to as swedes, Swedish turnips and turnip-rooted cabbage.

It, like turnips, is a member of the Cruciferae or cabbage family and belongs to the genus Brassica. Thus, rutabaga is related to turnip, cabbage, and cauliflower, but belongs to a different species; Brassica napobrassica.

Rutabaga resembles turnip in size of plant, in general size and shape of root, and in flesh colors. They differ chiefly in leaf characters and in minor details of root shape and structure. While turnip leaves are usually light green, thin, and hairy, those of rutabaga are bluish-green and smooth like cabbage. Turnip roots generally have little or no neck and a distinct taproot, while rutabagas often are slightly more elongated and have a thick leafy neck, with roots arising from underside as well as from the taproot.

Rutabaga is a cool-climate crop which requires that they be grown in the winter in Florida. For the most part, it is found primarily in home gardens in this State. Rutabaga will withstand frosts and mildly freezing temperatures.

They require a longer growing season (about 90 days) than do turnips. Culture is similar to that for beets in general. They are grown from seeds spaced 3 to 4 inches apart in 30-inch rows.

The main varieties are American Purple Top, Macomber, Purple Top Yellow, Long Island Improved, Sweet Russian, Laurentian, and Zwaan's Neckless Purple Top.

Rutabaga can be baked, diced, mashed, creamed, glazed, fried, added to casseroles, stews or soups, or served raw in salads.

(Stephens)