Vegetarian 88-11  
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I. NOTES OF INTEREST

A. Calendar


February 3, 1989. State Master Gardener Advisory Committee Meeting, 1308 Fifield, University of Florida. (Contact Kathleen Ruppert).


June 19-23, 1989. 4-H Horticulture Institute. 4-H Camp Ocala (Contact Jim Stephens).

II. COMMERCIAL VEGETABLES

A. Production of Seedless Watermelons: Part 3.

Refer to the September Vegetarian for information on development of seedless watermelon hybrids, the need for and arrangement of pollenizer rows, and the importance of adequate bee population for production of symmetrically-shaped fruit; and to the October Vegetarian for seed characteristics and crop establishment.

This section will focus on results of a seedless watermelon variety trial conducted at the Gulf Coast Research & Education Center in the spring of 1988. Seeds of 16 seedless watermelon varieties or experimental lines were seeded in a peat-lite growing mix in No. 150 Todd planter flats on January 26, 1988. After thorough watering, the flats were covered with polyethylene and placed in a greenhouse maintained at 80°F. At the first sign of emergence the polyethylene was removed, and the temperature was lowered to 70°F night and 80°F day.

The EauGallie fine sand was prepared in January 1988 by incorporation of starter fertilizer. Beds were formed, fumigated, and banded fertilizer was applied in shallow grooves on the bed shoulders after the beds were pressed and before the polyethylene mulch was applied. The final beds were 28 inc. wide and 6 in. high, and spaced on 9 ft. centers with seepage irrigation/drainage ditches on 4.5 ft. centers, or every 4 beds. The watermelon transplants were set in holes punched in the polyethylene at 4 ft. in-row spacing on February 29. Icebox watermelons planted on each side of two seedless watermelon beds served as pollenizers.

Watermelons were harvested three times beginning June 1 and ending June 23. Marketable melons were separated from culls and counted and weighed individually. Soluble solids determinations were made with a hand-held refractometer on at least 12 fruit from each entry over two harvests.

Early yields based on the first of three harvests, ranged from 85 cwt/A for CFREC (Central Florida Research and Education Center - Leesburg) 88-4 to 333 cwt/A for 'Jack of Hearts'. 'Quality' also produced high early yields. Early average fruit weight ranged from 13.0 lb for CFREC 88-8 to 16.2 lb for 'Jack of Hearts'.

Total yields ranged from 424 cwt/A for ACX 87m103 t 755 cwt/A for CFREC 88-7. Other high yielding varieties were CFREC 88-8, CFREC 88-2, 'Jack of Hearts', 'Queen of Hearts', CFREC 88-4, and 'Quality'. Average fruit weight for three harvests ranged from 11.7 lb for
'Fengshan No. 1' to 17.0 lb for CFREC 88-4. There was little difference within varieties in early average fruit weight or for the entire season.

Soluble solids were uniformly high, ranging from a low of 11.5% for 'Fengshan No. 1' to a high of 12.8% for 'Queen of Hearts'.

Based on this trial, 'Jack of Hearts', 'Queen of Hearts', and 'King of Hearts' appear to be the best available varieties for commercial production in Florida at the present time. For more information on this trial, request GCREC Research Report 1988-18 from the author.

There is considerable interest in the trade in production and marketing of seedless watermelons. Growers should be aware of some of the difficulties in seedless watermelon production and precautions necessary for successful production as outlined in this series of articles.

(Maynard, Vegetarian 88-11)

B. Collard Variety Trials.

A rather extensive collard variety trial has been conducted at the North Florida Research and Education Center in Quincy. Trials were conducted from 1983-1987 with 13 different planting dates. All trials were replicated 4 times with 25 feet per plot. In-row spacing was 12 inches and between row spacing was 36 inches except in 13 Feb. 1987 planting where a double row 14 inches apart was planted on black plastic mulch. Total fertilization was 190-100-220 lb/A (N-P2O5-K2O). Dacthal 75W was applied over top at 10 lb/A for weed control. Irrigation was supplied as needed by overhead sprinklers. Transplanting dates were 31 March 1983; 7 Sept. 1983; 25 Jan. 1984; 5 March 1984; 29 Aug. 1984; Oct. 1984; 4 March 1985; 19 Sept. 1985; 2 Jan. 1986; 20 Feb. 1986; 12 Sept. 1986; 13 Feb. 1987, and 8 Sept. 1987.

The results averaged over all planting dates are presented in the following Table:


<table>
<thead>
<tr>
<th>Variety</th>
<th>Source</th>
<th>Number of different planting dates</th>
<th>Yield² cwt/A</th>
<th>crates/A</th>
<th>Number of times ranked first</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue Max²</td>
<td>Abbott &amp; Cobb</td>
<td>13</td>
<td>352.7</td>
<td>1411</td>
<td>6</td>
</tr>
<tr>
<td>HiCrop²</td>
<td>Parks Seed</td>
<td>13</td>
<td>349.0</td>
<td>1396</td>
<td>5</td>
</tr>
<tr>
<td>Heavi-Crop²</td>
<td>Abbott &amp; Cobb</td>
<td>13</td>
<td>293.4</td>
<td>1174</td>
<td>0</td>
</tr>
<tr>
<td>Morris Heading</td>
<td>Northrup King</td>
<td>13</td>
<td>288.8</td>
<td>1155</td>
<td>0</td>
</tr>
<tr>
<td>Vates</td>
<td>Northrup King</td>
<td>13</td>
<td>279.6</td>
<td>1118</td>
<td>0</td>
</tr>
<tr>
<td>Georgia</td>
<td>Northrup King</td>
<td>13</td>
<td>276.5</td>
<td>1106</td>
<td>2</td>
</tr>
<tr>
<td>America</td>
<td>Northrup King</td>
<td>10</td>
<td>265.8</td>
<td>1063</td>
<td>0</td>
</tr>
<tr>
<td>Champion</td>
<td>Harris Moran</td>
<td>13</td>
<td>262.6</td>
<td>1050</td>
<td>0</td>
</tr>
<tr>
<td>Carolina</td>
<td>Northrup King</td>
<td>12</td>
<td>220.3</td>
<td>881</td>
<td>0</td>
</tr>
</tbody>
</table>

²Averaged yield over number of different planting dates.
³F₁ hybrids.
The top 3 varieties are hybrids from Japan. 'Blue Max' was top yielder with 'Hi Crop' very close behind. There is very little difference in yield between these 2 varieties and of the 13 trials they ranked first 11 times. After these 2, there was a drop in yield of about 5000 lb/ha before the next variety and the remaining varieties were fairly clumped except for 'Carolina'. 'Carolina' placed last in 8 out of the 12 trials that were planted. 'Georgia' ranked first in 2 of the trials but its overall yield was reduced because of severe bolting in 2 of the planting dates where it ranked last. On 25 Jan. 1984 and 2 Jan. 1986 planting dates, 100 and 85 percent, respectively, of the plants bolted and were not marketable. 'Champion', an improved 'Vates', had higher yields in only 3 of the 13 trials but were never significantly higher.

As can be seen from the yield results, much higher yields can be realized by the hybrids 'Blue Max' and 'Hi Crop', but one of the drawbacks is the much higher seed costs of the hybrids.

(Olson, Vegetarian 88-11)


Greenhouse vegetable production in Florida has been increasing over the last few years. We produce enough vegetables in greenhouses to rank Florida near the top in the nation. Florida has a wide range of producers ranging from a very large operation (about 20 acres) to small producers of 3,000 to 4,000 square feet. Most of the production is tomato and cucumber, but there are significant amounts of other crops such as lettuce, pepper, and herbs. Recently, a group of Extension specialists and county agents went on a study tour to many northern production areas in the U.S. and Canada. Our attempt has been to better prepare ourselves to better help our industry. Presently, we are authoring a comprehensive handbook for greenhouse vegetable production in Florida. The handbook will be divided into 4 volumes. Volume I will deal with the decision-making process and will be a small booklet to hand to someone who is investigating greenhouse production potential for himself. Volume II will deal with the broad topic of getting started and building the right kind of operation from the engineering and equipping point of view. Volume III will contain information on the nuts and bolts of production such as cultivars, fertilizer, water, pollinating, principles of pest control, and harvesting and handling. Volume IV will contain the specific labeled products for pest control (will be a short volume!).

The authoring is being done by a large and varied team. Armed with a little bit of experience and lots of literature, we hope to assemble a solid and helpful handbook. To help us in meeting everyone's needs, please take the time to fill out those greenhouse questionnaires the counties have received. Answers to the questions will help us provide the needed information in our handbook.

(Hochmuth, Vegetarian 88-11)

D. Precooling Cost-Efficiency.

Perishable vegetables should be precooled soon after harvest to preserve quality; rapid precooling is desired for the more perishable vegetables, or those that need to be shipped quickly. However, rapid precooling systems require greater refrigeration capacity and electricity demand. For those products that
do not require rapid precooling, a system should be devised that would be more cost-efficient. Forced-air cooling is one example of a method to precool certain vegetables and is a good example of cost-efficiency, reported from California (Davis). Increasing the cooling time should reduce electricity bills by (a) reducing electricity demand, (b) decreasing fan energy use and the refrigeration needed to remove heat produced by the fans, and (c) allowing the refrigeration system to operate more during the cooler night hours when it is more efficient.

In the comparison California used, they forced-air cooled a product in 6 or 15 hours which resulted in the cooler being used for 13 hours in the fast cooling system and 22 hours for the slow cooling option. Slow cooling reduced the peak refrigeration demand from 160 to 110 tons. This reduced the electricity bill by $540 per month based just on demand charges. They did not estimate the savings caused by less fan energy use or by increased refrigeration efficiency. Slow cooling saved 50 tons of refrigeration capacity. At today's prices (CA) this could cost from $60,000 to $100,000.

When planning new forced-air coolers for commodities that are not highly perishable (peppers, cucumbers, squash), consider slow cooling; it will allow you to install less refrigeration equipment. For existing systems that have extra cooling capacity, there will be little or no cost to use slow cooling. It can be done by just adding more product to a cooling location or by using fewer fans. Some axial flow fans may have their output reduced by blade pitch adjustment.

(Gull, Vegetarian 88-11)

III. PESTICIDE UPDATE

A. Dodder on Pepper in Florida

Dodder (Cuscuta sp.) is a true parasitic plant that is a serious problem in some areas of the East Coast. It has also been found sporadically in other pepper production areas of the state.

There are 170 Cuscuta species that are without exception parasites which depend on suitable host plants for their growth. The individual species mostly prefer a few particular host plants on which they can achieve optimal growth, but they can also parasitize numerous other plants. Dodder reproduces by seed. Germination takes place on or just below the soil surface. Through circular searching movements, the leafless seedling must come into contact with a host plant. Once it reaches a host plant, it twines around it and penetrates it with a haustorium.

In Palm Beach County it was previously believed that the dodder seed blew into the pepper plant holes, after the pepper was transplanted. We have now confirmed that this is not the case. Fumigation will control any dodder seed that is in the bed. Seed that is between the beds is not affected, however. In fields with a history of dodder infestation, we identified a large number of just germinated dodder seedlings during the middle of September, 1988. Where the middles were clean of weeds, these seedlings would grow for a short time, and when no host plant could be found, would die.

Unfortunately, where incomplete control of eclipta or nightshade was found, or where weed control was lacking, the dodder attached to these
weeds, infected them, and then grew to neighboring plants, also infecting them. The weeds not controlled in the middles then were an effective bridge for the dodder to finally reach the pepper.

If the dodder reached the pepper plants before the weeds in the middles were controlled, the dodder would survive the subsequent control of these weeds. The bridging of dodder from the row middles to the pepper takes less than a week. With the large numbers of dodder seedlings emerging in the row middles, it does not take many escaped weeds to allow subsequent pepper infection.

Control

Unfortunately, there is no herbicide at the present time that will selectively control the dodder and not harm the pepper, after the pepper is infected. The only recourse then is to control the dodder prior to infection of the crop.

Pre-emergence. One strategy is to control the germinating dodder seed in the row middles.

Dacthal has a label on peppers and although it does not have a dodder label in pepper, it has dodder labels in other crops.

Dacthal, at high rates, will inhibit dodder germination and will disrupt its growth and infecting ability. For Dacthal to be effective, however, it must be applied just prior to dodder germination. Extremely close scouting of fields must be done. When any dodder is seen to be germinating, the herbicide should be applied.

Future work is planned to characterize the conditions for dodder germination in Florida.

Predictive models are already available for swamp dodder in the North. These do not, however, correspond to the field dodder in Florida. We do know that dodder germinates by the middle of September, the exact date in the fall and the spring dates is not known. Predicting germination would greatly increase the probability of controlling dodder in the middles.

Antor and Dual, which have the potential for row middle labels in the future on pepper also have shown efficacy for controlling germinating dodder seed. Postemergence trials with these two herbicides so far have been negative.

Postemergence. Controlling weeds in the row middles is extremely important. Many materials that will burn down the weeds in the middles will also control dodder. Paraquat will control emerged dodder plants.

Bioherbicides. Dr. T. A. Bewick, Vegetable Crops Dept. - Gainesville has isolated a fungus (Alternaria sp.) from swamp dodder in Wisconsin. He has also isolated similar fungi from field dodder in Florida. The fungus spores, when sprayed on in great enough quantity will infect dodder and cause a disease of the plant great enough to reduce its potential as a weed. A patent for this process has been applied for.

Future work to commercialize the bioherbicide is in progress.

(Stall, Vegetarian 88-11)
IV. VEGETABLE GARDENING

A. Survey - Vegetable Gardening in Containers.

Throughout Florida and other states, many gardeners grow vegetables in a wide assortment of containers, ranging from small clay or plastic pots up to constructed boxes and beds. To determine how frequently this type of gardening is done, and gather some information about it, Palm Beach agent Gene Joyner conducted a mail survey with 120 gardeners who had attended his spring garden meeting. Here are the results of the 36 returns.

Ques. 1. How many times have you raised vegetables in containers in the last five years? never 14; 1 year 6; 2-4 years 6; every year 6

Ques. 2. How many containers? 1-2 7; 3-5 7; 6-10 2; 10 or more 2

Ques. 3. What type of containers do you prefer for growing vegetables? plastic 11; wooden 2; cement/clay 8; glass 0; metal 0

Ques. 4. Vegetables you grow in containers. 1. tomato; 2. pepper; 3. herbs; 4. cucumber; 5. radish; 6. chives; 7. rosemary; 8. eggplant; 9. parsley

Ques. 5. How are vegetables started? purchased transplants 18; plants from seed 10

Ques. 6. Which materials do you use? purchased soil mixes 15; animal manures 9; peat or sphagnum 6; perlite or vermiculite 5; sawdust of wood shavings 2

Ques. 7. Which fertilizer do you normally use? liquid/soluble 14; slow release 2; dry (granular) 6

Ques. 8. How often do you water your container vegetables? every day 4; 4-5 times/week 7; 2-3 times/week 8; once/week 2

Ques. 9. Which pest control methods do you prefer? chemical sprays 7; mechanical removal 4; combination of both 11

Ques. 10. Which insecticides do you used most often? Malathion 5; Kelthane 0

Ques. 11. Which fungicides do you normally use? Orthocide (Captan) 0; Maneb 2; Dithane 0; Copper 4; Benlate (Benomyl) 3; premixed combination sprays 5

Ques. 12. List the four most aggravating problems. 1. watering schedules; 2. low yield; 3. insects and diseases; 4. weeds.

Ques. 13. Give your best estimate of how much total money was spent this year on each plant in your container garden. ($4.97 average)

Ques. 14. What was the approximate total amount of money spent in your entire container vegetable garden (including all costs of pots, soil mixes, plants, fertilizers, chemicals, etc.). $40.39 average

Ques. 15. Were you satisfied with the amount of vegetables produced? Yes 12; No 6

Ques. 16. Would a ground type garden be higher yielding? Yes 14; No 6

(Stephens, Vegetarian 88-10)