Vegetarian 87-08
August 17, 1987

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I. NOTES OF INTEREST

A. Vegetable Crops Calendar.


B. Dr. Thomas Bewick Joins Vegetable Crops Department.

Dr. Thomas Bewick joined the Vegetable Crops faculty July 7, 1987. Tom is a recent graduate of the Horticulture Dept. at the University of Wisconsin where he worked extensively in the area of weed science in vegetable crops. He is a native of Chicago, Illinois, attended secondary school in Virginia and went on to earn his B.S. degree in Horticulture at U.C. Davis. Following that degree he spent about 6 years in California and Maryland in the private sector producing vegetables for fresh market and processing. Subsequently he enrolled in a M.S. program at the University of Wisconsin and after obtaining that degree continued working toward the Ph.D.

Tom's appointment is both teaching and research and will be responsible for teaching one of the undergraduate vegetable production courses as well as the World Vegetables course. He will continue his research interests in weed science and has particular interest in biological control methods.

(Kostewicz, Veg. 87-08)

II. COMMERCIAL VEGETABLES

A. Field Testing Micronutrient Fertilizer Rates For Potatoes Predicted By Mehlich-I Extractant.

Present interpretations of Mehlich-I extractable copper, manganese, and zinc are tentative. Interpretation depends on soil pH; the critical levels increase with pH and the extractant is not recommended for alkaline soils. To develop more data with which to better calibrate this soil test, we conducted a micronutrient test with potatoes near Live Oak in Suwannee county.

Preplant soil test micronutrient values indicated that little to no response would be expected from addition of Cu, Mn, or Zn to this soil with a pH of about 6.2, (Table 1). Zinc even appears to be very high. The field used for the study had been in field corn for several years to which routine additions of zinc were made.

Micronutrient fertilizer amounts tested were factorial combinations of zero and 3 lb/A Cu, zero and 5 lb/A Mn, and zero and 3 lb/A Zn.

<table>
<thead>
<tr>
<th>Critical Element</th>
<th>Avg.</th>
<th>Range</th>
<th>Critical range</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>6.2</td>
<td>6.0-6.8</td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td>3.0</td>
<td>2.1-9.2</td>
<td>0.5-1.0</td>
</tr>
<tr>
<td>Copper</td>
<td>0.4</td>
<td>0.2-2.3</td>
<td>0.3-0.5</td>
</tr>
<tr>
<td>Manganese</td>
<td>5.9</td>
<td>4.0-9.2</td>
<td>5.0-7.0</td>
</tr>
</tbody>
</table>

Micronutrient mixtures were formulated from nitrate forms and applied in a liquid band to both sides of the seed piece about 3 inches from the seed piece. Micronutrients were applied on February 17, 1987 four days after
'La Rouge' potatoes had been planted. Nitrogen, phosphorus, and potassium was added to equal the grower practice. Remaining cultural practices were those of the grower.

Potatoes were harvested and graded on June 10, 1987 2 weeks after vine killing. Potatoes were graded into size categories of "A", "B", and "small" according to USDA standards. Analysis of variance showed that the main effects of copper and manganese were not significant for marketable yield, or for any grade category. Zinc did not affect large or small potato yields but did increase the "B" size yield. No interactions were significant except for the Cu x Zn on grade A. Here, the best response was from no addition of Cu or Zn (Table 2).

Table 2. Yield of size "A" potatoes. Means (8 observations) for Cu x Zn interaction.

<table>
<thead>
<tr>
<th>Cu rate (cwt/A)</th>
<th>Zn rate (cwt/A)</th>
<th>0</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>131.0</td>
<td>106.9</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>108.8</td>
<td>117.3</td>
</tr>
</tbody>
</table>

The results of this study show that no additions of fertilizer micronutrients were needed on this soil, and that additions of certain micronutrients and combinations of micronutrients (especially copper and zinc) actually depressed yield. In addition this research provides data that supports the present critical values for interpretation of Mehlich-I extractable Cu, Mn, and Zn. In fact, the soil test predicted potential problems from toxicity if additions of zinc were made because the soil test values were well above the critical values. The results from the analysis of "A" Potato yield indicate a toxicity may have occurred.

(Hochmuth and Hanlon Veg. 87-08)

B. Calabaza Production.

Calabaza (Cucurbita moschata (Duchesne) Poir.) is a subtropical/tropical pumpkin frequently called Cuban pumpkin. 'La Primera', an improved cultivar, was introduced in 1979 by Dr. Ray Volin formerly of the IFAS Tropical Research and Education Center in Homestead. Unfortunately, commercial seed have not been available to growers who continue to use their own seed saved from season to season. Recently, however, two seed suppliers indicated that they will have 'La Primera' seed available in the near future.

Meanwhile, increases from seed obtained from Florida Foundation Seed Producers have been made at Leesburg AREC and the Gulf Coast Research and Education Center. Seed is available to county agents who wish to establish trials or who have growers interested in trial plantings.

Performance of 'La Primera' in the spring 1987 seed increase block at the Gulf Coast Research and Education Center was evaluated. Beds on 9 ft centers were prepared on February 18 including incorporation of 500 lb 0-20-0, fumigation with 50 lb Vorlex, and application of two surface bands of 1000 lb 18-0-25 per acre on the bed shoulders, and application of black polyethylene mulch. The crop was established by direct-seeding on March 5 using a 4 ft in-row spacing. The stand was adjusted by thinning to about 1200 plants per acre. The crop was seep-irrigated. Approved fungicides were applied for control of downy mildew and gummy stem blight.

The pumpkins were harvested on June 25 as the vines were starting to go down, and the most mature pumpkins were yellow-orange colored. Each fruit was weighed and counted; the yields expanded to a 4840 linear
Table 1. Calabaza yield per acre and average fruit weight. GCREC, Spring 1987.

<table>
<thead>
<tr>
<th>Fruit Number</th>
<th>Weight (ton)</th>
<th>Average Fruit Weight (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,574</td>
<td>27.5</td>
<td>21.4</td>
</tr>
</tbody>
</table>

Yields at GCREC were much higher than the approximately 13 tons per acre reported in Homestead mostly because of higher average fruit weight, 21.4 lb in Bradenton versus 16.2 lb in Homestead. Most fruit ranged between 10 and 25 lb, however, 27% of the fruit were larger than 25 lb whereas only 3% of the fruit were less than 10 lb (Table 2). The largest fruit weighed 53.2 lb.

Table 2. Calabaza fruit weight distribution. GCREC, Spring 1987.

<table>
<thead>
<tr>
<th>Fruit Weight (lb)</th>
<th>Distribution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 10</td>
<td>3</td>
</tr>
<tr>
<td>10-15</td>
<td>18</td>
</tr>
<tr>
<td>15-20</td>
<td>29</td>
</tr>
<tr>
<td>20-25</td>
<td>23</td>
</tr>
<tr>
<td>25-30</td>
<td>14</td>
</tr>
<tr>
<td>30-35</td>
<td>8</td>
</tr>
<tr>
<td>35-40</td>
<td>3</td>
</tr>
<tr>
<td>&gt; 40</td>
<td>2</td>
</tr>
</tbody>
</table>

Calabaza is a high quality, tropical-type pumpkin widely used by Hispanics. Although it is virtually unknown to other segments of the population, there is reason to believe that it would be accepted for culinary use in anyway that butternut or similar type squash is now used, including pie filling. Large fruit size might discourage some consumers, but retailers could consider selling halves or quarters like watermelon. Another option would be to sell peeled and cubed calabaza in preweighed polyethylene bags as a convenience vegetable.  
(Maynard, Veg. 87-08)

III. PESTICIDE UPDATE

A. Allelopathy: Chemical Warfare Between Plants.

It is obvious that weeds can exert harmful interference on crop growth, yield and quality. Much of the interference is due to competition of the weeds with the crop for resources such as water, nutrients and light. A question that is not clearly defined is how much interference is due to competition and how much is due to chemical toxins released by the weeds.

The term allelopathy refers to the deleterious effect that one higher plant has on another through the production of chemicals that escape into the environment.

Allelopaths are released into the environment by 5 main means: 1) root exudates, 2) direct tissue contact, 3) leachates from various tissues, 4) volatilization and 5) through decay.

The classic case of allelopathy is the wilting of tomato plants in close proximity to black walnut trees. It was noted that tomato and potato plants grown near black walnut trees would wilt and die. The substance juglone, which could be extracted from the roots and hulls of the walnut was identified as a powerful toxin to these and several other plants.

Chemicals with allelopathic potential have been isolated from virtually all tissues of a plant, including leaves, stems, roots, rhizomes, flowers, fruits and seeds. Al Putnam at Michigan State has found that phytotoxins produced on the trichomes (hairs) of the stems and petioles of velvetleaf, a common weed in the midwest, can be leached or removed by misting water.

Many other plants have been implicated as producing allelopathic compounds. Whether compounds are released into the environment in
Plant growth reducing allelopaths have been indicated for problem weeds such as nightshades, parthenium, yellow and purple nutsedge and several mustard weeds among others.

Another allelopathic phenomena is the production by some plants of seed germination inhibitors. These inhibitors, many times volatiles, will inhibit the germination of seeds of its own species and sometimes will stop germination of many species. Plant succession in various ecosystems can be attributed to allelopaths from the dominant plant community.

Joan Dusky at the EREC, Belle Glade, working in muck soils has found celery, when disked under and rotting will form allelopathic compounds which will inhibit or reduce lettuce seed germination and also inhibit the germination of several weed seeds. Various Cruciferae, cultivated and weed species have potent germination inhibitors. Work in Texas at a USDA Laboratory has shown that stands of carrot and beets are reduced when planted into soil that has decomposing cabbage residue in it.

The study of allelopathy is a relatively new field. The importance of the study of these phenomena is important in an applied sense. As more is known on the toxicity arising from plant residues, recommendations will be made in the production of these crops to reduce the effect on subsequent crops in the same field.

In another sense, residues, if managed may have influence only on emergence and growth of weeds. Recent work on cover crops and surface stubble residues in conservative-tillage systems have reduced germination and growth of several annual weed species.

As more is learned about the germination inhibition effect of allelopathic compounds, these natural compounds may be used in biocontrol programs. Conversely compounds to reverse the process of inhibition may be developed to cause large numbers of the weed seeds to germinate at one time so they may be destroyed in a fallow situation.

The study of allelopathy is an exciting field that will have far reaching effects on crop production. Several books and monographs are published on the subject. The knowledge is also expanding rapidly. If any agent observes phenomena in the field that possibly could be attributed to allelopathic effects, it would be appreciated if they would bring it to our attention for possible investigation.

(Stall, Veg. 87-08)

IV. HOME GARDENING

A. Master Gardener Coordinator Position Changes Departments.

With the departure of Kathleen Delate back in December, much of the daily attention to program details slowed down considerably. I have attempted to provide information, answer questions, and send out supplies as requested. Bob Black has been working on arrangements for the Continued Training Session scheduled for August 20-21. Dan Cantliffe has maintained open lines with administration and the rest of us concerning the direction of the program.

Probably all of you know of the decision made to hire a replacement for Kathleen Delate, but with a revised job description and position classification. We are in the process of filling that position now from the group of excellent candidates applying. Bob Black is chairman of the search and screen committee for this position.
Another important decision was made to move the position from the Vegetable Crops Department, where it was centered from the program's beginning in 1979, to the Ornamental Horticulture Department. The initial phase of this transfer has been made, with all of the records, materials, and supplies having been moved to the O.H. Dept. in July.

With the transfer to the O.H. Department, inquiries about supplies and program materials should be directed to Bob Black in that department. But please keep in mind that this is a transitory period during which supplies may not be readily available. When the new person gets on board, one of the first jobs will be to unpack everything (including supplies), inventory them, and handle all back orders. Hopefully, the switchover will go smoothly. Since most training courses will not begin until the fall, there is still time to receive supplies after the new person is hired to handle the orders.

The Florida Master Gardener program seems to be in high gear in most all of the thirty five counties. Hopefully, there will be little or no slow-down in the pace due to this transitory period.

(Stephens, Veg. 87-08)

B. 4-H Plant Science Demonstrations-1987 Results.

Horticulture demonstrations have long been a part of the scene at State 4-H Congress. However, this year the horticulture category was expanded to include other plant groups, particularly agronomic crops, and is now called Plant Science Demonstrations.

Fourteen demonstrations were given in this event, held on the second day of 4-H Congress. Actually, most all were about horticultural crops. The one exception was on the subject of fescue grass for horse pasture.

The following table gives the results of the event. Winners were announced during the awards ceremony held in the University of Florida Auditorium. The top team will represent Florida in Indianapolis during the National Junior Horticultural Association Convention in October. The trip is sponsored by the Florida Fruit and Vegetable Association, The Florida Department of Agriculture and Consumer Services, and the Florida 4-H Foundation.
Results
State 4-H Plant Science Demonstrations
Room 1304 Fifield Hall
J. M. Stephens, Coordinator
July 28, 1987

<table>
<thead>
<tr>
<th>Placing</th>
<th>Score</th>
<th>Name</th>
<th>County</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>95.67</td>
<td>Karen Brown and Karen Doughtery</td>
<td>Marion</td>
<td>Growing Ferns</td>
</tr>
<tr>
<td>Second</td>
<td>95.33</td>
<td>Tycee Betts</td>
<td>Manatee</td>
<td>Cold Protection of Fruit Trees</td>
</tr>
<tr>
<td>Third</td>
<td>94.33</td>
<td>Chris Tompkins</td>
<td>Hillsborough</td>
<td>Strawberry Marketing</td>
</tr>
<tr>
<td>Fourth</td>
<td>93.67</td>
<td>Leanne Barco and Edwin Rooks</td>
<td>Citrus</td>
<td>Grafting the Rose</td>
</tr>
<tr>
<td>Fifth</td>
<td>92.33</td>
<td>Belinda McQuillen</td>
<td>Highlands</td>
<td>Caladiums</td>
</tr>
<tr>
<td>Sixth</td>
<td>91.00</td>
<td>Kevin Crowell</td>
<td>Polk</td>
<td>Fertilizing Your Florida Lawn</td>
</tr>
<tr>
<td>Seventh</td>
<td>90.67</td>
<td>Sarah Ahmed and Rhonda Roberts</td>
<td>Levy</td>
<td>Roses in Competition</td>
</tr>
<tr>
<td>Eighth</td>
<td>90.00</td>
<td>Heather Anderson</td>
<td>Pinellas</td>
<td>Bonsai</td>
</tr>
<tr>
<td>Ninth</td>
<td>88.67</td>
<td>Jamie Hostetter</td>
<td>Gadsden</td>
<td>Propagation</td>
</tr>
<tr>
<td>Tenth</td>
<td>88.33</td>
<td>Mark Fooshee</td>
<td>Duval</td>
<td>Plant Propagation</td>
</tr>
<tr>
<td>Eleventh</td>
<td>85.00</td>
<td>Jonathan Hill</td>
<td>Volusia</td>
<td>Orchids</td>
</tr>
<tr>
<td>Twelfth</td>
<td>84.67</td>
<td>Melody Duncan and Vicky Rose</td>
<td>Gilchrist</td>
<td>Fertilizers and Rate of Growth</td>
</tr>
<tr>
<td>Thirteenth</td>
<td>80.33</td>
<td>Scott Parker</td>
<td>Escambia</td>
<td>Can Fescue Be To Blame</td>
</tr>
<tr>
<td>Fourteenth</td>
<td>79.67</td>
<td>Travis Evans</td>
<td>Suwannee</td>
<td>Seeds to Flowers</td>
</tr>
</tbody>
</table>

(Stephens 87-08)

Prepared by Extension Vegetable Crops Specialists

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