Vegetarian 88-09

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September 13, 1988

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I. NOTES OF INTEREST

A. Calendar


B. New Publications


A 4-5 day tour of commercial horticultural operations will cover current technological procedures used in the harvesting and handling of vegetable, fruits, and ornamentals in Florida. This will be offered as a one credit course, HOS 5330, and will provide an excellent opportunity for county agents to visit a wide range of operations.

Please contact Steve Sargent, (Suncom 622-7911), Vegetable Crops Department for further details.

D. Florida Pepper Institute.

The 1988 Florida Pepper Institute will be held Thursday, October 27, 1988 at the Southwest Florida Research and Education Center, Immokalee. A preliminary program follows:
1988 Florida Pepper Institute
Thursday, October 27, 1988
Southwest Florida Research & Education Center
Immokalee, Florida

R.L. Brown - Moderator

a.m.
9:30 Registration. Coffee and doughnuts courtesy of Johnny Johnson Greenhouses and Nurseries.
10:00 Welcome. C.E. Arnold, director, SWFREC, Immokalee.
10:20 Results of Pepper N & K Fertilizer Demonstration. G.J. Hochmuth, Vegetable Crops Dept., Gainesville; P.R. Gilreath, Manatee County Cooperative Extension, Palmetto; and K.D. Shuler, Palm Beach Cooperative Extension, Delray Beach.
10:50 Yield Response of Bell Peppers to Biostimulants. A.A. Csizinszky, GCREC, Bradenton.
11:30 Observations on Peppers in Northeast Markets. K.D. Shuler, Palm Beach County Cooperative Extension, Delray Beach.
11:45 Overview of the National Pepper Conference. P.H. Everett, Pacific Land Co., Immokalee.

12:00 Lunch. Courtesy of Agrisales, Inc. and Petoseed Co., Inc.

D.N. Maynard - Moderator

p.m.
1:15 The Best Pepper Varieties for Florida - Panel Discussion. D.N. Maynard, GCREC, Bradenton- moderator
S.J. Gzapanoski, Northrup King Co., Naples
D.S. Kammerlohr, Petoseed, Felda
T.K. Howe, GCREC, Bradenton
C.W. Obern, Johnny Johnson Greenhouses, Immokalee
J.N. Simons, JMS Flower Farms, Vero Beach.
2:45 Registration Options for Crop Protection Chemicals. D. Botts, Florida Fruit & Vegetable Association, Orlando.
3:25 Questions.
3:45 Adjourn.

(Stall, Vegetarian 88-09)
II. COMMERCIAL VEGETABLES

A. Dilemma in Shipping Mixed Loads.

Rains (or lack thereof), temperature variations, disease, insects, machines and rough handling are not the only hazards which produce have to face on their way from field to market. Confinement with other products in the transport vehicle can also be a formidable enemy. As products share a common carrier, incompatibles will arise.

This is especially true with the movement of mixed loads. Combining products that are incompatible in terms of ethylene production and sensitivity, odor emissions, and temperature/moisture requirements present a real challenge for both produce shipper and receivers.

Logistics of mixed loads have also caused problems. These mixed loads frequently require multiple pickups and drops which add to the overall transit time; overall longevity of the product must diminish. It may take up to three days for a trucker to complete his rounds to fill out a load, several additional hours at terminal market to make deliveries and therefore the product is exposed to additional stresses and deteriorative responses.

Products would benefit from loading into the transport vehicle according to degree of perishability; products most easily damaged should be loaded toward the middle and most durable products at the end of the vehicle, over the axles, which is the area where more impact damage would be expected to occur.

Shipping incompatible products in proximity with each other would be less damaging than warehousing these items together. Therefore, buyers and terminal markets bear the ultimate responsibility in maximizing shelf-life of perishable products.

Some production areas have reported that at certain times of the year one may get away with shipping incompatible items together. In California, Iceberg lettuce is much more susceptible to ethylene during May. Consequently, lettuce is not shipped with heavy ethylene-producing items at this time. In Florida we have not identified such situations. A differential response of product to temperature has not been established, regardless of area or season.

Controlled atmospheres now are being used selectively with overseas shipment of some fresh produce but the feasibility of this adaption to domestic transportation remains in a question because of economics; coast-to-coast transit, utilizing CA isn’t worth the expense.

Reducing the problems of shipping mixed loads may be moderated by research into modified atmosphere packaging and transportation. Currently, strawberries are the only fresh produce commodity shipped routinely in modified atmospheres. However, attaining perfection in transport of mixed loads appears impossible. Until then, restricting citrus to straight loads and keeping cantaloupe and tomatoes separate from vegetables loads which have temperature and ethylene incompatibility, should be practiced.

(Gull, Vegetarian 88-09)

B. Production of Seedless Watermelons.

Specialty vegetables are in high demand in the 1980’s, and seedless watermelons offer an attractive alternative for the
 upscale consumer and the food service industry. At the same time, new varieties are being developed that are superior to those that have been available.

The concept of seedless watermelons was described first in the U.S. literature in 1951 based on experimentation that began in Japan in 1939. Seed for planting seedless watermelons resulted from a cross between a selected tetraploid female parent and a selected diploid male parent. Tetraploid lines are developed by treating diploid lines with colchicine. The resulting triploid is sterile and does not produce viable seeds. However, small, white rudimentary seeds develop which are eaten along with the fruit like cucumber seeds.

Fruit enlargement in normal fruit, including watermelon, is enhanced by growth promoting hormones produced by the developing seed. Growth hormones are lacking in seedless watermelons so those agents are provided from pollen. However, flowers on triploid plants lack sufficient pollen to effect complete pollination so normal watermelons are interplanted with triploids to serve as pollenizers. The field should be laid out so that the pollenizer variety is planted in every third row with the seedless variety in the two intervening rows. Almost any open-pollinated or hybrid variety can be an effective pollenizer. However, it will be easier to separate the seedless melons from the normal melons if they are of distinct types. For example, if the seedless variety produces an oblong, striped melon like 'King of Hearts', an icebox type pollenizer such as 'Micky Lee' would be easy to distinguish from the seedless variety. It is important to have a market for the pollenizer variety since about one-third of the total yield will be pollenizer melons.

An adequate bee population is necessary to transfer pollen from the pollenizer variety to the seedless variety. At least eight visits to an individual flower are necessary for normal fruit development in diploid watermelons. This frequency of visitation usually is provided by strategically placing one active hive for each one to three acres of watermelons. There are no data available for the number of bee visitations necessary to produce symmetrical seedless fruit. However, it is thought that the bee population should be similar to that needed for diploid pollination.

More information on seedless watermelon production will appear in future issues of the Vegetarian.

(Maynard, Vegetarian 88-09)

C. Soil Testing and CNR - A Case Study.

Much work has been done over the years by IFAS researchers to determine fertilizer management programs for pepper. This research literature was reviewed by myself and Ed Hanlon to establish current IFAS fertilizer recommendations. Based on this review, the pepper CNR's for N, P(P2O5), and K(K2O) were set at 160,160, and 160 lb/acre. We needed to develop a closer relationship however between soil test indices and fertilizer rate recommendations than had been done by past research. To fill in some of the blanks, we have been conducting demonstrations in South Florida for the past few years. This pepper group includes myself, Ed Hanlon, Phyllis Gilreath, Ken Shuler, and for a while Rick Mitchell. Our work with potassium has yielded some
very valuable data to use in recalibrating our Mehlich-I soil extraction solution.

This past spring, Ed, Allen Tyree, and I conducted a large-scale demonstration with the Hamilton Produce Company pepper operation near Jennings, Florida. Our objective was to test IFAS soil-test-based fertilizer recommendations on a large-scale area. Fortunately, Mr. Harold Law provided a 10-acre block of pepper to use.

Soil samples were collected from a 10-acre block, 4 samples from each 5-acre section. Samples were extracted with the Mehlich-I solution and analyzed at the IFAS Extension Soil Testing Lab in Gainesville. Results of the analyses are presented in Table 1 along with the interpretations. The 10-acre block had received dolomite and gypsum prior to our sampling. The soil pH over the 10-acre block was considered adequate for pepper production. The phosphorus indices in both 5-acre blocks were both in the very high range meaning that no response to phosphorus fertilizer would be expected.

Potassium indices were "medium" and IFAS recommendations were for 105 lb. per acre K2O. Based on extensive potassium research in south Florida in 1986-1987, it was determined that a potassium index in the area of 70 to 80 ppm should be considered as "high" rather than "medium". We decided, therefore, to test the idea that the soil potassium index is really "high". One 5-acre block received 50 lb. per acre K2O; the other received zero K2O.

Other nutrients Ca, Mg, and the micronutrients Zn and Mn were all considered to be in very adequate amounts. Calcium and Mg were high probably due to recent application of dolomite and gypsum. Zinc and Mn indices were high, especially for zinc. Although copper was interpreted as low, it was felt that adequate copper would be supplied from pesticides. Sulfur would have been added in adequate amounts from gypsum and from sulfur in the irrigation water.

In summary, soil-tests indicated that, for many nutrients (P, K, Ca, Mg, Zn, Cu, Mn, and S), adequate amounts to supply the CNR of these nutrients could be derived from the soil. Nitrogen is added totally from fertilizer since very little is assumed to be supplied from the soil. Research has determined that 160 lb. per acre is adequate for optimum yields from a 3 to 4 harvest pepper crop. Nitrogen scheduling is presented in Table 2.

A comparison of standardized IFAS fertilizer recommendations with the commercial fertilizer program is made in Table 3. The differences in amounts of recommended fertilizers are dramatic, especially for phosphorus and potassium.

Another difference in the two fertilizer programs lies in the management system. Part of the grower's nitrogen fertilizer was applied in the bed as a starter mix. All IFAS nitrogen was applied through the drip system.

Yield results in Table 4 show no difference in yield among the 3 test areas. Several points can be made about these results:

1. Soil testing works! Using soil-test results we decided not to add P or micronutrients. No deficiencies were observed and no negative effect on yield resulted. Based on the K results, we could have elected to add no K.
2. A corollary to the above is: "Florida soils are not hydroponics." Obviously this sandy soil was able to supply nearly all of the nutrients needed by the pepper crop.

3. The nitrogen management system with drip irrigation scheduling worked so that the IFAS recommendations of 160 lb per acre were confirmed.

4. Fertilizing by a calibrated soil-test can save the grower a bunch of money.

Table 1. Mehlich-I (double-acid) pre-fertilization soil-test indices for Hamilton Produce Co., Spring, 1988.

<table>
<thead>
<tr>
<th>Test area</th>
<th>pH</th>
<th>P</th>
<th>K</th>
<th>Ca</th>
<th>Mg</th>
<th>Zn</th>
<th>Cu</th>
<th>Mn</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To receive K</td>
<td>6.4²</td>
<td>183</td>
<td>73</td>
<td>529</td>
<td>52</td>
<td>7.0</td>
<td>.23</td>
<td>11.7</td>
</tr>
<tr>
<td>2. No K</td>
<td>6.6</td>
<td>191</td>
<td>83</td>
<td>629</td>
<td>63</td>
<td>5.9</td>
<td>.22</td>
<td>11.6</td>
</tr>
</tbody>
</table>

Interpretation
OK VH M OK H VH L H

²Average of four samples in 5-acre blocks.

Table 2. Fertilizer injection schedules for IFAS fertilizer program, Hamilton Produce, Spring, 1988.

<table>
<thead>
<tr>
<th>week</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb. N per acre per week</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>7.0</td>
<td>7.0</td>
<td>10.5</td>
<td>10.5</td>
<td>10.5</td>
<td>21.0</td>
<td>21.0</td>
<td>21.0</td>
</tr>
</tbody>
</table>
Table 3. Fertilizer amounts applied to commercial and IFAS pepper.

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>IFAS</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb. per acre</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>165</td>
<td>218</td>
</tr>
<tr>
<td>P ((P_2O_5))</td>
<td>0</td>
<td>125</td>
</tr>
<tr>
<td>K ((K_2O))</td>
<td>0 or 50</td>
<td>404</td>
</tr>
<tr>
<td>Ca</td>
<td>0</td>
<td>26</td>
</tr>
<tr>
<td>Mg</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>S</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Zn</td>
<td>0</td>
<td>1.2</td>
</tr>
<tr>
<td>Mn</td>
<td>0</td>
<td>0.9</td>
</tr>
<tr>
<td>Cu</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>0</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Table 4. Total yields of pepper, Hamilton Produce, Spring, 1988.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Fancy jumbo</th>
<th>No. 1</th>
<th>No. 2</th>
<th>Cull</th>
<th>Total Mkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFAS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Added K</td>
<td>122</td>
<td>1156</td>
<td>215</td>
<td>114</td>
<td>1493</td>
</tr>
<tr>
<td>No Added K</td>
<td>124</td>
<td>1226</td>
<td>125</td>
<td>95</td>
<td>1475</td>
</tr>
<tr>
<td>Commercial</td>
<td>130</td>
<td>1233</td>
<td>150</td>
<td>137</td>
<td>1513</td>
</tr>
</tbody>
</table>

*(Average pepper production within Florida is about 500 bu/A.)*

(Hochmuth, Hanlon; Vegetarian 88-09)

III. PESTICIDE UPDATE

A. Sethoxydim (Poast) labels on several vegetables.

Sethoxydim (Poast) has received labels for the control of grass weeds on several vegetables. The herbicide is to be used postemergence to actively growing grass at 0.188 - 0.28 lbs ai/A. Use 2 pints of Crop Oil Concentrate in 5 to 20 gallons of water per application.

1. Cucurbits - Cantaloupe, cucumber, muskmelon, pumpkins, summer and winter squash and watermelon. A total of 3 pt. product per acre may be applied in on season. Do not apply within 14 days of harvest.
2. Celery, lettuce (head and leaf), spinach. A total of 3 pt product per acre may be applied in one season. Do not apply within 30 days of harvest.

3. Broccoli, cabbage, cauliflower. A total of 3 pt. product per acre may be applied. Do not apply within 30 days of harvest.

4. Eggplant, pepper (bell and non-bell). A total of 4 1/2 pts product per acre may be used per growing season. Do not apply within 20 days of harvest.

(Stall, Vegetarian 88-09)

B. Fluazifop (Fusilade 2000) label on Endive and Spinach.

Fusilade 2000 has been granted a label for the control of actively growing grass weeds in endive and spinach. Recommended rates are .188 lb ai/A and a total of 96 oz. (75 lb/ai) may be applied per season. Use a crop oil concentrate at 0.5 to 1% V/V or a non-ionic surfactant at .25 to 0.5% V/V in spray mixture. Do not apply within 28 days of harvest for endive and 30 days for spinach.

(Stall, Vegetarian 88-09)

C. Paraquat (Gramoxone Super) Directed Spray for Melons.

A special local needs (24c) for Florida only has been granted for the use of Gramoxone Super on melons. The label is for a directed-shielded spray for the control of emerged weeds in row middles. Add a non-ionic surfactant at 8 fluid oz. per 100 gallons of spray mix. Do not apply more than three times per season.

(Stall, Vegetarian 88-09)

IV. VEGETABLE GARDENING

A. Luffa Gourd - Revision.

Luffa is the genus and common name of gourds known also as vegetable sponges, dishcloth gourds, and running okra. The Luffa acutangula (L.) Roxb. is the species most commonly grown in this country. It has prominent raised longitudinal ridges on the fruits. The smooth, non-ribbed type is L. aegyptica (or L. cylindrica). Both produce large 3 inch diameter flowers on strong-smelling, yet attractive cucumber-like elongated vines. The fruits, which are usually 12 to 18 inches in length and 3 to 4 inches in diameter, have a very well-developed, fibrous interior which may be used instead of a cloth or sponge for scrubbing and cleaning. The immature fruits when young and tender, may be eaten as cooked vegetables, very much like okra or summer squash. The smooth luffa produces the best quality sponges.

Distribution and Importance

Luffa and other gourds are annuals, and are adapted for planting throughout Florida and the continental United States except in the extreme Northern United States where the growing season is not of sufficient length. They do well in a climate where day temperature in midsummer is from 70° to 85° F and the night temperature only a few degrees lower. Young seedlings are very tender and are easily injured by cold.

Luffa originated in India, and now thrives as wild and cultivated plants throughout tropical regions. In Florida, the Luffa gourd is grown almost entirely in home gardens, and at present is not a commercial crop.
of any value. It is grown throughout the continental United States except in areas of extreme cold.

**Culture**

This gourd is relatively easy to cultivate. Because of its close relationship to cucumbers and squashes, soils and cultural methods adapted to the production of these crops usually give good results with Luffas. Commercial fertilizer alone or in combination with rotted manure or compost will be found suitable for providing the necessary plant food. Because Luffa gourds make a rapid growth, it is essential that they be provided with an abundance of plant food. Usually, two to three pounds of a common analysis garden fertilizer per 100 square feet of soil will get them off to a good start. Additional sidedressings made by scattering a handful of fertilizer every 10 feet down the row will be needed from time to time, unless the soil is well-composted.

The black, flat, pitted seeds may be planted in the open as soon as all danger of frost is past. However, the young seedlings are very tender and easily injured by cold. They require from three to four months to mature fruit that can be eaten as a vegetable, and longer (140 days) for the dried product.

If several rows are desired, the rows are usually spaced 7 to 9 feet apart with the plants 4 to 5 feet apart in the row. They may also be planted in hills 8 or 9 feet apart with 2 or 3 plants in each hill. For best results, the vines should be trained on trellises or arbors. The garden fence might be just the thing for this purpose.

Luffas require a reasonable amount of moisture and should be watered during periods of dry weather. Toward the end of the season, water should be withheld so that the gourds will ripen before frost.

**Problems and Care**

Luffas are subject to injury from the same diseases, insects, and nematodes that attack cucumbers and muskmelons. Downy and powdery mildew are the most prevalent diseases, along with fruit rots. They are also susceptible to certain wilt diseases, and mosaic virus disease is sometimes encountered. Crop rotation from one area to another helps in all cases. Like most cucurbits, luffa needs a lot of bees for pollination.

**Harvesting and Handling**

For eating, pick the luffa gourd before it is 6 or 7 inches long. It should be tender and without the stringy fibers. Some people use them fresh in salads like cucumbers, while others use them cooked in a variety of ways, including stuffed.

If used for purposes other than eating, the Luffa gourds should remain on the vines until they are ripe or until the vines and fruits are killed by frost. When the fruits and the stem turn yellow, it is time to harvest the gourds.

When the gourds are first gathered as a dried product, they should be washed in some disinfectant to prevent the development of molds. After thorough drying in the sun, the gourd can be polished and painted for ornamental purposes.

For sponges, the Luffa gourds should be soaked in water until the outer covering and the pith soften. After softening, the outer covering, seeds, and pithy materials can be removed by peeling or brushing. The extracted sponges should then be
washed through several changes of clean water and dried in the sun. Some gardeners have even cleaned the sponges in a washing machine.

Clean luffa sponges have a variety of uses. In general, they have substituted for regular sponges, being used as dish-rags, pot scrapers, and in facial cleaning.

(Stephens, Vegetarian 88-09)

B. 1989 National Gardening Grant Program.

The National Gardening Association (NGA), of Burlington, Vermont, will conduct its 8th Annual Gardening Grant Program. There have been 80,000 youth gardeners benefitting from these grants to date, according to the NJHA.

In 1989, 100 awards will be made to qualified and needy youth groups in schools, camps, clubs, and other organized youth programs, including Florida 4-H projects. Among the eligible types of gardening activities are intergenerational gardens, disabled children gardens, and 4-H Community gardens. Perhaps the Florida 4-H Horticultural Institute could benefit from this grant program also.

Each grant package contains approximately $600 worth of tools, seeds, gardening equipment and supplies, program information, and "how-to" guides for beginners and advanced participants. Also included for each grant recipient will be a 1-year subscription to the National Gardening magazine; one of the best magazines on gardening in the U.S.

Applications for the 1989 National Gardening Grants are available now. To receive yours (along with grant guidelines) just send a self-addressed stamped envelop to the National Gardening Association, 180 Flynn Avenue, Burlington, VT 05401.

Deadline for Applying: All completed applications must be received by NGA postmarked no later than November 15, 1988. The grants will be awarded in January, 1989.

(Stephens, Vegetarian 88-09)