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I. NOTES OF INTEREST

A. Calendar.


B. New Publications.


II. COMMERCIAL VEGETABLES

A. New Tomato Virus Outbreak in Southwest Florida.

Late on Friday, September 8, a series of tomato samples were submitted to the Florida Extension Plant Disease Clinic (FEPDC). These samples originated from Collier County from scouts employed by Glades Crop Care, Inc. One plant exhibited a bright yellow mosaic symptom that is typical of symptoms induced by the 'gemini' viruses. Appropriate sample processing followed and resulted in the diagnosis of an unspecified 'gemini' virus affecting these commercial tomatoes.

The 'gemini' viruses represent a fairly new group of viruses. Florida tomato growers are already familiar with the more common representative of this group in the State--pseudo curly top virus, which is a minor problem during fall production periods. The 'gemini' viruses
possess single-stranded, circular DNA and exist as paired particles in the plant. This group of viruses is vectored by either whiteflies or leafhoppers and is typically neither seed transmitted nor mechanically transmitted at high frequencies.

Symptoms on infected plants seem to reflect two distinct viruses. The most obvious case was a bright, canary yellow mosaic accompanied by leaf distortion and puckering. Plant stunting seemed to be correlated with early infection. This syndrome was rare in the field and represented less than 0.5% of plants. The second disease syndrome was far more extensive in the field. Some early planted fields in the Naples area exhibited a 98-100% plant infection in the field across 14-20 acre blocks. Affected plants developed a stunted appearance accompanied by a downward arching of petioles. Leaflets exhibited a mottled appearance with common interveinal chlorosis, as if the plant was minor element deficient. Leaflets would exhibit curling (upward or downward), distortion, and in some plants an obvious vein banding. Severity of symptoms seemed to correlate with earliness of infection. No fruit symptoms, flower or fruit abortion has been observed to date.

In the two weeks that followed, a number of tomato samples were received from commercial and research fields in the Collier/Lee, Hillsborough/Manatee, and Gadsden tomato production areas. Approximately half of the two dozen samples received were confirmed to be infected with a 'gemini' virus. On September 27-29, a field survey was undertaken by G. W. Simone in the Collier and Manatee county areas. Approximately four dozen samples were collected from 12 different growers in the two county tour.

After all samples were processed, the following diagnostic results are available:

<table>
<thead>
<tr>
<th>County</th>
<th>No. of growers</th>
<th>Gemini Virus Samples¹</th>
<th>Virus present</th>
<th>Virus absent²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collier</td>
<td>10</td>
<td>44</td>
<td>37</td>
<td>7</td>
</tr>
<tr>
<td>Gadsden</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Lee</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Manatee</td>
<td>7</td>
<td>11</td>
<td>9</td>
<td>2</td>
</tr>
</tbody>
</table>

¹Positive samples were obtained from 11 cultivars or breeding lines.
²Some negative responses were due to inadequately submitted samples that prevented appropriate processing.

Field survey results indicated a wide distribution of this 'gemini' virus complex in the Collier/Lee and Hillsborough/Manatee production area. Growers that planted at the end of July through the first two weeks of August had fields with almost uniform infection. Successive planted fields exhibited 5-15% infection after being in the fields for 6 weeks. The suspected vector is the sweet potato whitefly (Bremisia tabaci) which is still prevalent in all tomato fields.
examined. No weeds, sampled to date, have been found positive for this virus. Until the identity of the 'gemini' virus(s) is known, specific information on the vector, biology of the virus in the vector and host plant, weed hosts, useful control measures, and potential yield impact in Florida cannot be defined.

Sample processing to date has relied entirely upon the search for nuclear inclusions produced by the virus in the parenchyma cells associated with the vascular tissue. These inclusions can be observed after suitable staining with a selective nucleic acid stain (Azure A) in thin sections cut through leaflet or petiole veins and examined under 1600x magnification. To process tomato samples for both the normally observed viruses in Florida and the 'gemini' group, average preparation and examination time is 45-60 minutes per sample.

The Plant Pathology Department in IFAS is reacting to this potentially damaging new disease as follows:

1. Samples are continuing to be processed in the FEPDC to further document disease distribution within Florida.

2. Samples of symptomatic plant material have been sent to Dr. Judith Brown at the University of Arizona for identification of the virus(s) present in the southwest tomato production area. Dr. Brown is one of the few researchers in the United States that possesses the diagnostic technology to distinguish among the 'gemini' viruses. These samples were forwarded to Arizona on October 4.

3. Dr. Ernest Hiebert (IFAS) has verified the 'gemini' virus diagnosis made through the use of plant virus inclusions by testing plant extracts against an antiserum to another 'gemini' virus--bean golden mosaic virus.

4. The Plant Pathology Department invited Dr. Brown to Florida for consultation on this virus problem.

5. Additional field survey work will be conducted for both the virus incidence and possible weed reservoir hosts once the identity of this virus is known.

6. Plants are ready for necessary virus transmission studies by grafting and mechanical transmission once the virus is identified.

7. Further information will be released concerning the virus disease cycle, etc. once identity of the specific 'gemini' virus is revealed.

(Simone, Extension Plant Pathologist, Vegetarian 89-11)

B. Tomato Transplants & Gemini Virus.

A major concern for tomato growers statewide this fall has been the whitefly transmitted Gemini virus. A concern has been whether or not the virus could be shipped in on the transplant. To date, there are no reports of transplants being rejected because of obvious virus symptoms. However, as the source of inoculum continues to grow, symptoms may be seen on younger and younger plantings, implying transplant involvement.

The sweet potato whitefly has a range that extends from 30°S to 30°N in latitude (slightly north of St. Augustine, FL). In this range they can freely reproduce and overwinter. If a plant containing whitefly pupae or adults is shipped to Michigan, for example, these life stages can develop and produce successive generations during the summer. Should either of these shipped stages contain virus, the virus may possibly spread.

In spring 1990, for vegetable transplants shipped out of state, DPI will
enforce a July 1987 ruling designed to address whitefly infestations in bedding crops. This rule simply states that if 20% of the plants in the crop have 20% of the leaves infested with 5 or more whiteflies or pupae, the crop will not be certified. This level of incidence indicates inadequate whitefly control and will justify regulatory action. The crop can be certified and shipped with proper cleanup in terms of reduced whitefly numbers. The state of Florida does not regulate transplant traffic within its boundaries.

Producers of spring vegetable transplants should be highly concerned with sanitation. Not just within the plant house, but around the plant house and in fields adjacent to the plant house. At the present time we are not sure which weeds may be harboring a ready source of Gemini virus. However, the fall tomato crop or its residue can provide all the inoculum needed to infect the spring transplant crop for northern markets.

(Vavrina, Vegetarian 89-11)

C. Results of Muskmelon Nitrogen Studies.

During 1986-89, Ed Hanlon, Bob Hochmuth and I have conducted N studies with polyethylene-mulched muskmelons in various cultural systems. Four studies were conducted testing rates of N from zero to 240 lb. per acre. Studies were conducted in Gainesville, Osteen, and Live Oak, Florida. Overhead sprinkler, subsurface, and drip irrigation was used at Gainesville, Osteen, and Live Oak, respectively. Results showed that N crop nutrient requirements were about 120 to 140 lb. per acre calculated on basis of 5-foot bed centers (8700 linear bed feet of crop). Substantially less N was needed in situations where mulch was used on soils with organic matter greater than 2.0%. Muskmelon leaf-nitrogen critical concentrations were 4% at early fruit set.

(Hochmuth, Vegetarian 89-11)

III. PESTICIDE UPDATE

A. Section 18 for Diquat in Tomato and Pepper Row Middles.

The U.S. Environmental Protection Agency (E.P.A.), under the provisions of section 18 of FIFRA, has issued a specific exemption for use of Diquat to control nightshade and parthenium on tomatoes and green peppers.

A maximum of 2 ground applications at a rate of 0.5 lb. a.i. per acre may be made per season. A thirty (30) day PHI will be observed. The exemption expires August 31, 1990. All instructions on the label must be followed.

B. Diquat 24C Label for Burndown of Tomato Vines.

Diquat has received a special local needs (24C) label for use for burndown of tomato vines after final harvest.

The label states application of 1.5 pints of Diquat per acre in 60 to 120 gallons of water per acre. Add 16-32 ounces of Valent X-77 spreader per 100 gallons of spray mix. Thorough coverage of tomato vines is required to insure maximum burndown.

To help facilitate removal of Sweet Potato Whitefly, burn tomato vines with propane burners as soon as possible after the vines have dried down sufficiently.

C. Dacthal W-75 Supplemental Labeling for Brassica Leafy Vegetable Group.

Fermenta ASC has added the Brassica leafy vegetables to the Dacthal W-75 label.

Dacthal W-75 may now be applied at 6-14 lb. (product) at seeding or transplanting to the Brassica Group. This group includes broccoli, Chinese broccoli, broccoli raab (rapini), Brussels sprouts, cabbage, Chinese cabbage (bok choy, Napa), Chinese mustard cabbage (gai
choy), cauliflower, collards, kale, kohlrabi, mustard greens, and rape greens.

The Supplemental Labeling must be in the possession of the user at the time of pesticide application.

D. Supplemental Label for Aerial Application of Gramoxone Super.

ICI Americas has added an aerial application label to the preplant or pre-emergence treatment for lettuce, melons, peppers, and tomatoes.

Gramoxone Super should be applied at 2 ½ to 5 pints per acre before or after planting but before crop emergence. Aerial applications should be made in a minimum of five (5) gallons of water per acre. A nonionic surfactant should always be included.

The supplemental labelling must be in the possession of the user at the time of application.

(Stall, Vegetarian 89-11)

Table 1. Current Florida record-size vegetables, 1 November 1989.

<table>
<thead>
<tr>
<th>Vegetable</th>
<th>Size</th>
<th>Grower</th>
<th>Location</th>
<th>Date Recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beet</td>
<td>28 oz.</td>
<td>Mike Lazin</td>
<td>Gainesville</td>
<td>02/13/86</td>
</tr>
<tr>
<td>Cabbage</td>
<td>13 lb.</td>
<td>Wayne Boynton</td>
<td>W. Palm Beach</td>
<td>01/18/88</td>
</tr>
<tr>
<td>Calabaza</td>
<td>19 lb. 1 oz.</td>
<td>C. Bonvechio</td>
<td>W. Palm Beach</td>
<td>01/25/89</td>
</tr>
<tr>
<td>Cantaloupe</td>
<td>16 lb. 8 oz.</td>
<td>Raymond Ashley</td>
<td>St. Augustine</td>
<td>07/14/89</td>
</tr>
<tr>
<td>Carrot</td>
<td>26 oz.</td>
<td>Mike Lazin</td>
<td>Gainesville</td>
<td>02/13/86</td>
</tr>
<tr>
<td>Chicory</td>
<td>19 oz.</td>
<td>Mike Lazin</td>
<td>Gainesville</td>
<td>02/13/86</td>
</tr>
<tr>
<td>Cucumber</td>
<td>43.5 oz.</td>
<td>Gene Muehlbauer</td>
<td>Spring Hill</td>
<td>07/14/89</td>
</tr>
<tr>
<td>Cucumber</td>
<td>19 5/16 in.</td>
<td>Gene Muehlbauer</td>
<td>Spring Hill</td>
<td>07/14/89</td>
</tr>
<tr>
<td>Jicama</td>
<td>6 oz.</td>
<td>C. Bonvechio</td>
<td>W. Palm Beach</td>
<td>01/25/89</td>
</tr>
<tr>
<td>Kohlrabi</td>
<td>4 lb. 15 oz.</td>
<td>Sam Eisenberg</td>
<td>Jacksonville</td>
<td>06/03/89</td>
</tr>
<tr>
<td>Okra (Stalk)</td>
<td>17' 6 1/4&quot;</td>
<td>Bud Crosby</td>
<td>Brooksville</td>
<td>12/10/86</td>
</tr>
<tr>
<td>Pepper</td>
<td>7 oz.</td>
<td>C. Bonvechio</td>
<td>W. Palm Beach</td>
<td>01/25/89</td>
</tr>
<tr>
<td>Potato, I.</td>
<td>32 oz.</td>
<td>Anonymous</td>
<td>Jacksonville</td>
<td>05/30/87</td>
</tr>
<tr>
<td>Potato, Sweet</td>
<td>20 lb. 0 oz.</td>
<td>J. Mullins</td>
<td>Jacksonville</td>
<td>01/15/87</td>
</tr>
<tr>
<td>Radish, Sum.</td>
<td>31 oz.</td>
<td>Mike Lazin</td>
<td>Gainesville</td>
<td>02/13/86</td>
</tr>
<tr>
<td>Radish, Win.</td>
<td>25 lb.</td>
<td>Herbert Breslow</td>
<td>Ruskin</td>
<td>1977</td>
</tr>
<tr>
<td>Pumpkin</td>
<td>200 lb.</td>
<td>Theron Hunter</td>
<td>Keystone Hgts.</td>
<td>07/14/89</td>
</tr>
</tbody>
</table>
Agents may order official record keeping forms from Jim Stephens, Gainesville. These forms give instructions on how to measure, verify, and report the achievement to me.

(Stephens, Vegetarian 89-11)

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