

**Agronomy Facts No. 43**  
**Revised January 2001**

**2000 CYST NEMATODE- RESISTANT SOYBEAN VARIETY TEST**

Soybean cyst nematode (*Heterodera glycines*) was found in Maryland for the first time in 1980. Since the first discovery, damaging levels of cyst nematodes have been identified in most Eastern Shore counties and in two counties west of the Chesapeake Bay. Typical aboveground soybean plant symptoms are stunting, yellowing, and wilting under moisture stress. These symptoms usually appear on scattered patches of plants in infested fields.

The selection and use of resistant soybean varieties is one of the best production practices available to reduce yield losses due to nematodes. Most resistant varieties are not immune to attack by all cyst nematodes because the plant's resistance is specific for individual cyst nematode races. Infested fields may contain a mixture of cyst nematode races. A resistant variety planted in these fields must carry resistance to the most prevalent race of cyst nematode in the field to produce satisfactory yields. However, continuous production of a variety resistant to the same races could shift the prevalence of races in that field to ones that can infect the resistant variety. Therefore, it is best to rotate nonhost crops such as corn or sorghum with resistant soybean varieties in cyst-infested fields.

A variety test was established in 2000 by the Maryland Agricultural Experiment Station, Department of Natural Resource Sciences and Landscape Architecture, to provide soybean growers with the latest information on agronomic performance of varieties with resistance to cyst nematodes. Entries in the test included public and private brands, varieties, and experimental lines that have resistance to various races of cyst nematodes. The susceptible varieties Essex, Hutcheson, Chesapeake, Stressland, and Williams 82 were used as control plots. Several experimental lines developed by university soybean breeders were also evaluated in the tests. These lines and their origin are IL 6353 from Illinois; MD 95-5260, MD 95-5358, MD 96-5275, MD 96-5472, MD 96-5502, MD 97-5010, MD 97-5361, MD 97-5939, MD 97-6065, MD 97-6156 from Maryland; TN 94-213 from Tennessee; and V 95-0391, V 97-2659, V 98-0301, V 98-0329 from Virginia.

A list of the released entries in the 2000 test, their respective maturity group designation, the races of cyst nematodes to which each has resistance, and the suppliers of the private entries who paid a fee are listed in Table 1. Since cyst-infested fields can also contain other nematode species, a rating for resistance to root-knot nematode (*Meloidogyne incognita*) is also given in Table 1 if the supplier gave this information.

Two tests were planted near Salisbury, MD in Wicomico County. One test was located at the Pemberton Historical Park in a field that is primarily infested with cyst nematode races 1 and 5. The other test was located at the Lower Eastern Shore Research and Education Center, Salisbury Facility in a field that is infested with a mixture of races 1, 3, and 5. At planting, the soil in the test area at the Pemberton Historical Park and the Salisbury Facility averaged less than 10 full cysts/250 cc of soil. Even though the initial number of cysts in the soil in the test sites was relatively low at planting, the nematode population can build quickly to damaging levels.

The entries were divided into their designated maturity groups so that entries within a test would be of similar maturity. Each entry was evaluated in a four-row plot, 11 feet in length, replicated four times. Row spacing was 30 inches and the seeding rate was 8 seeds/foot. Recommended cultural practices were followed in establishing and maintaining the plots (Table 2). Yield data were determined by harvesting an 8-foot section from the center rows of each plot. Plant height was determined at maturity when 95% of the pods on each entry had attained their mature color. The total number of full cysts on four plants from each plot was determined at each site approximately 30-35 days after planting.

All data were statistically analyzed. A least significant difference (LSD) value was calculated for each characteristic. This number is a statistical test calculated at the 20% probability level to aid in comparing the differences among entries. When two entries are compared and the difference between them is greater than the calculated LSD value, the entries are judged to be statistically different. This means that there is an 80% probability that the differences observed in the test are real (not due to chance). A designation of "NS" indicates that there are no statistically significant differences among the entries in the test for that characteristic.

The 2000 growing season was very favorable for soybean growth across the state. Rainfall at the Salisbury Facility exceeded the long-term averages in June, July, and September (Table 3). The tests at the Salisbury Facility also received irrigation on September 13 of about 1 inch. The presence of late-season populations of corn earworm (*Heliothis zea*) necessitated spray applications at the Salisbury Facility.

Seed yields are shown in Tables 4-7. The yields of the susceptible varieties Chesapeake, Essex, Hutcheson, Stressland, and Williams 82 were usually below the maturity group mean in the tests. Note the number of cysts found on the susceptible varieties. Varieties are usually classified as resistant if they have less than 10% of the number of cysts found on susceptible varieties. Although some of the susceptible varieties have fewer cysts than other entries in the test, this probably reflects the variation in distribution of cysts in the soil.

Although all of the entries in the test except the susceptible varieties carry some resistance to cyst nematodes, it is evident that entries differ in their level of resistance. These test results also illustrate the importance of growing varieties that carry resistance to the race of nematodes present in specific infested fields. Cyst nematode races 1 and 3 are the most frequently observed races in Maryland. Soybean growers must determine the race of cyst nematode that is present in their infested fields so that they can select an appropriate soybean variety. Frequently growers do not know the race of cyst nematode in their fields and they plant a variety with resistance to race 3 because these varieties are the most widely available. Growers who have planted cyst nematode-resistant varieties but have observed damage on the variety should check with their county extension office for assistance in determining the race present in their infested fields.

The performance of a variety for several years gives the best measure of its yield potential and agronomic characteristics. The average yields of those varieties grown for two years at each location can be determined from data in Tables 4-7.

Most soybean varieties with cyst nematode resistance carry resistance to race 3 (and some other races), but very few entries in this test have resistance to both races 1 and 3. In

addition to Accomac, Delsoy 5710, Hartwig, Ina, Manokin, and Wicomico, other soybean varieties which were previously tested with reported resistance to both races 1 and 3 are Clark brand CL36c, DeltaPine brand DP415, Forrest, and Pioneer brand 9521. The information provided here should be used as a guide and growers should select a variety with great care based on personal experience as well as other available information.

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Acknowledgements:

The financial support of the Maryland Soybean Board, which helped to provide equipment and funds for conducting this research, is greatly appreciated. The contributions of L.A. Wood, J.M. Treacy, R.F. Morris, F.L. Wells, S. Sardanelli, V. Calder, D. Willey, J. Lynch, A. Cooper, and F.R. Mulford of the University of Maryland, and J.E. Terrell, Jr., Department of Recreation and Parks, Wicomico County, are recognized as being essential in the successful completion of this test and are gratefully acknowledged.

Additional information:

Inclusion of entries in the Cyst Nematode-Resistant Soybean Variety Test does not constitute an endorsement or recommendation of a specific entry by the University of Maryland. Advertising statements by an individual company about the performance of its entries can be made as long as they are accurate statements about the data as published, with no reference to other companies' varieties. Statements similar to the "See the official Cyst Nematode-Resistant Variety Test, Agronomy Facts No. 43" and "Endorsement or recommendation by the University of Maryland is not implied" must accompany any information that is reproduced. Agronomy Facts No. 43 can be downloaded from the University of Maryland Cropping Systems webpage:

<http://www.agnr.umd.edu/users/nrsl/crops>

Table 1. Maturity group, nematode resistance and seed supplier of released entries grown in the 2000 test.

| BRAND        | ENTRY       | Maturity Group | Resistant* to |           | Supplier                                      |
|--------------|-------------|----------------|---------------|-----------|---|
|              |             |                | Cyst Races    | Root Knot |   |
| CLARKS       | CL47NRR     | IV-S           | R3, R14       | NT        | Clark Seeds, Inc.<br>Kenton, DE 19955         |
| GARST        | 4423RR/N    | IV             | R3**          | NT        | Garst Seed Co.<br>Providence Forge, VA 23140  |
| MID ATLANTIC | MA4211nRR   | IV             | R3**          | NT        | Mid Atlantic Seeds<br>York, PA 17403          |
|              | MA4311n     | IV             | R3**          | NT        |   |
|              | MA5000RR    | V              | R3**          | NT        |   |
| S. STATES    | RT3799N     | III            | R3, R14       | NT        | Southern States Coop.<br>Richmond, VA 23260   |
|              | 4299N       | IV             | R3, R14       | NT        |   |
|              | RT4495N     | IV             | R3, R14       | NT        |   |
|              | 4483N-STS   | IV             | R3, R14       | NT        |   |
|              | RT517N      | V              | R3, R14       | NT        |   |
|              | XP5409N     | V              | R3, R14       | NT        |   |
| VIGORO       | V410SCN     | IV             | R3, MR14      | S         | Royster-Clark, Inc.<br>Mt. Sterling, OH 43143 |
|              | V450NRR     | IV-S           | R3, MR14      | S         |   |
|              | V542NRR     | V              | R3, MR14      | S         |   |
| PUBLIC       | ACCOMAC     | V              | R1, R3        | R         | VA Ag Experiment Station                      |
|              | ANAND       | V              | R3,R5,R14     | S         | MO Ag Experiment Station                      |
|              | DELSOY 5710 | V              | R1-R5,R14+    | R         | MO Ag Experiment Station                      |
|              | FOWLER      | V              | R2,R3,R5,R14  | S         | USDA & TN Ag Experiment Station               |
|              | HARTWIG     | V              | R1-R5,R14+    | R         | MO Ag Experiment Station                      |
|              | INA         | IV             | R1-R5         | NT        | IL Ag Experiment Station                      |
|              | JACK        | III            | R3            | NT        | IL Ag Experiment Station                      |
|              | LS 92-4173  | IV             | R3,R14,MR4&5  | NT        | Southern IL University-Carbondale             |
|              | LS 93-0375  | IV             | R3, R14       | NT        | Southern IL University-Carbondale             |
|              | MANOKIN     | IV-S           | R1, R3        | MR        | MD Ag Experiment Station                      |
|              | MUSTANG     | IV             | R3, R14       | NT        | MO Ag Experiment Station                      |
|              | PANA        | III            | R2-4,MR5,R14  | NT        | IL Ag Experiment Station                      |
|              | REND        | IV             | R3, R4, R14   | NT        | IL Ag Experiment Station                      |
|              | WICOMICO    | V              | R1, R3        | S         | MD Ag Experiment Station                      |

\*R=resistant; MR=moderately resistant; S=susceptible; +=resistant to other races; NT=not tested

\*\* Not reported but assumed to be R3

Table 2. Soybean test plot information.

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Lower Eastern Shore Research & Education Center, Salisbury Facility  
 Wicomico County, Salisbury

Cooperator: F.L. Wells  
 Planting Date: June 22  
 Row Spacing: 30 inches  
 Soil Type: Norfolk loamy sand  
 Soil Test: pH 6.1, P Index- Excess, K Index- Optimum  
 Previous Crop: Soybeans  
 Fertilizer: 200 lbs/A 0-15-40  
 Lime: None  
 Herbicide: 0.8 lb Lorox-DF and 1 pt/A Dual II Magnum  
 Insecticide: 3 oz/A Warrior (Sept. 5)  
 Cultivation: Once  
 Irrigation: 1 inch - Sept. 13

Pemberton Historical Park  
 Wicomico County, Salisbury

Cooperator: J.E. Terrell, Jr.  
 Planting Date: June 23  
 Row Spacing: 30 inches  
 Soil Type: Norfolk loamy sand  
 Soil Test: pH 5.7, P Index- Excess, K Index- Medium  
 Previous Crop: Soybean  
 Fertilizer: 200 lbs/A 0-15-40  
 Lime: None  
 Herbicide: 0.8 lb Lorox DF and 1 pt/A Dual II Magnum  
 Insecticide: None  
 Cultivation: Once  
 Irrigation: None

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Table 3. Monthly 2000 and 30-year average precipitation (inches) during May through October at LES-REC, Salisbury Facility.

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|         | <b>May</b> | <b>June</b> | <b>July</b> | <b>Aug.</b> | <b>Sept.</b> | <b>Oct.</b> | <b>Season</b> |
|---------|------------|-------------|-------------|-------------|--------------|-------------|---------------|
| 2000    | 2.38       | 5.93        | 6.87        | 2.94        | 6.32         | 0.11        | 24.55         |
| Average | 3.32       | 3.62        | 3.76        | 5.72        | 3.59         | 3.63        | 23.64         |

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Irrigation in addition to rainfall at Salisbury Facility: 1 inch on Sept. 13

Table 4. Seed yields (1999 and 2000) and performance of entries of Maturity Groups III and IV grown at the Salisbury Facility in a cyst nematode-infested soil. (Races 1,3 & 5)

| BRAND - ENTRY             | Seed Yield, Bu/A  |             | Height, Inches | Full Cysts/<br>4 Plants* |
|---------------------------|-------------------|-------------|----------------|--------------------------|
|                           | 2000              | 1999        |                |                          |
| <b>MATURITY GROUP III</b> |                   |             |                |                          |
| S.STATES - RT3799N        | 18.6              | -           | 15             | 58                       |
| PUBLIC - JACK             | 17.3              | 18.7        | 16             | 73                       |
| EXPERIMENTAL - IL 6353    | 17.3              | -           | 15             | 80                       |
| PUBLIC - PANA             | 16.5              | 22.4        | 17             | 75                       |
| PUBLIC - WILLIAMS 82 (S)  | 9.3               | 15.8        | 14             | 133                      |
|                           | <b>Mean</b>       | <b>15.8</b> | <b>18.9</b>    | <b>15</b>                |
|                           | <b>LSD (0.20)</b> | <b>3.3</b>  | <b>2.9</b>     | <b>1</b>                 |
| <b>MATURITY GROUP IV</b>  |                   |             |                |                          |
| PUBLIC - INA              | 34.7              | 28.1        | 25             | 13                       |
| PUBLIC - REND             | 31.0              | 26.0        | 23             | 95                       |
| MID ATLANTIC - MA4211nRR  | 29.1              | -           | 19             | 108                      |
| VIGORO - V410SCN          | 27.7              | -           | 21             | 245                      |
| S.STATES - 4483N-ST5      | 26.9              | -           | 22             | 327                      |
| EXPERIMENTAL - MD 97-6156 | 26.5              | -           | 22             | 158                      |
| S.STATES - 4299N          | 25.6              | -           | 20             | 333                      |
| PUBLIC - LS 92-4173       | 25.5              | 27.0        | 22             | 285                      |
| EXPERIMENTAL - MD 95-5358 | 23.9              | 25.7        | 19             | 235                      |
| PUBLIC - LS 93-0375       | 23.4              | 24.9        | 20             | 470                      |
| GARST - 4423RR/N          | 21.9              | -           | 20             | 625                      |
| MID ATLANTIC - MA4311n    | 21.7              | -           | 21             | 268                      |
| S.STATES - RT4495N        | 21.3              | 23.9        | 17             | 318                      |
| PUBLIC - MUSTANG          | 21.0              | 24.3        | 21             | 200                      |
| EXPERIMENTAL - MD 97-5939 | 20.7              | -           | 21             | 345                      |
| PUBLIC - STRESSLAND (S)   | 19.4              | 25.1        | 22             | 717                      |
|                           | <b>Mean</b>       | <b>25.0</b> | <b>24.8</b>    | <b>21</b>                |
|                           | <b>LSD (0.20)</b> | <b>4.2</b>  | <b>2.8</b>     | <b>2</b>                 |

\*Full Cysts/ 4 Plants on August 9

Table 5. Seed yields (1999 and 2000) and performance of entries of Maturity Groups IV-S and V grown at the Salisbury Facility in a cyst nematode-infested soil. (Races 1,3 & 5)

| BRAND – ENTRY              | Seed Yield, Bu/A  |             | Height, Inches | Full Cysts/<br>4 Plants* |
|----------------------------|-------------------|-------------|----------------|--------------------------|
|                            | 2000              | 1999        |                |                          |
| <b>MATURITY GROUP IV-S</b> |                   |             |                |                          |
| PUBLIC - MANOKIN           | 36.5              | 34.0        | 27             | 138                      |
| EXPERIMENTAL - MD 96-5275  | 32.1              | 34.6        | 21             | 8                        |
| EXPERIMENTAL - MD 96-5472  | 27.7              | 30.9        | 21             | 18                       |
| CLARKS - CL47NRR           | 22.9              | -           | 19             | 128                      |
| EXPERIMENTAL - MD 97-5010  | 21.8              | -           | 17             | 125                      |
| VIGORO - V450NRR           | 21.0              | -           | 20             | 523                      |
| PUBLIC - CHESAPEAKE (S)    | 20.8              | -           | 17             | 460                      |
|                            | <b>Mean</b>       | <b>26.1</b> | <b>32.0</b>    | <b>20</b>                |
|                            | <b>LSD (0.20)</b> | <b>2.9</b>  | <b>3.6</b>     | <b>2</b>                 |
| <b>MATURITY GROUP V</b>    |                   |             |                |                          |
| EXPERIMENTAL - MD 96-5502  | 38.0              | 39.4        | 26             | 50                       |
| PUBLIC - DELSOY 5710       | 36.6              | 43.2        | 30             | 5                        |
| PUBLIC - HARTWIG           | 32.3              | 31.1        | 27             | 3                        |
| PUBLIC - FOWLER            | 32.3              | 37.3        | 27             | 13                       |
| EXPERIMENTAL - MD 97-6065  | 32.2              | -           | 23             | 235                      |
| PUBLIC - ANAND             | 32.2              | 35.6        | 22             | 75                       |
| PUBLIC - WICOMICO          | 31.6              | 38.9        | 31             | 40                       |
| EXPERIMENTAL - V 95-0391   | 30.6              | -           | 21             | 268                      |
| PUBLIC - ACCOMAC           | 30.5              | 38.5        | 31             | 128                      |
| EXPERIMENTAL - V 98-0329   | 30.5              | -           | 25             | 210                      |
| EXPERIMENTAL - V 98-0301   | 28.6              | -           | 26             | 193                      |
| EXPERIMENTAL - V 97-2659   | 27.8              | -           | 24             | 213                      |
| EXPERIMENTAL - TN 94-213   | 26.4              | -           | 23             | 430                      |
| S.STATES - XP5409N         | 25.4              | -           | 26             | 130                      |
| EXPERIMENTAL - MD 95-5260  | 24.6              | 28.5        | 22             | 153                      |
| S.STATES - RT517N          | 24.2              | 31.9        | 25             | 215                      |
| MID ATLANTIC - 5000RR      | 22.3              | -           | 21             | 80                       |
| VIGORO - V542NRR           | 22.1              | -           | 24             | 78                       |
| EXPERIMENTAL - MD 97-5361  | 20.3              | -           | 23             | 119                      |
| PUBLIC - ESSEX (S)         | 24.7              | 32.3        | 20             | 100                      |
| PUBLIC - HUTCHESON (S)     | 25.7              | 30.7        | 23             | 218                      |
|                            | <b>Mean</b>       | <b>28.5</b> | <b>34.0</b>    | <b>25</b>                |
|                            | <b>LSD (0.20)</b> | <b>4.6</b>  | <b>4.3</b>     | <b>2</b>                 |

\*Full Cysts/4 Plants on August 9

Table 6. Seed yields (1999 and 2000) and performance of entries of Maturity Groups III and IV grown at Pemberton Historical Park in a cyst nematode-infested soil. (Races 1 & 5)

| BRAND - ENTRY             | Seed Yield, Bu/A  |             | Height, Inches | Full Cysts/<br>4 Plants* |
|---------------------------|-------------------|-------------|----------------|--------------------------|
|                           | 2000              | 1999        |                |                          |
| <b>MATURITY GROUP III</b> |                   |             |                |                          |
| S.STATES - RT3799N        | 26.2              | -           | 20             | 40                       |
| PUBLIC - PANA             | 23.2              | 19.9        | 24             | 45                       |
| EXPERIMENTAL - IL 6353    | 18.1              | -           | 22             | 43                       |
| PUBLIC - JACK             | **                | 18.0        | 26             | 15                       |
| PUBLIC - WILLIAMS 82 (S)  | 22.6              | 18.9        | 22             | 48                       |
|                           | <b>Mean</b>       | <b>18.1</b> | <b>18.5</b>    | <b>23</b>                |
|                           | <b>LSD (0.20)</b> | <b>2.8</b>  | <b>NS</b>      | <b>2</b>                 |
| <b>MATURITY GROUP IV</b>  |                   |             |                |                          |
| PUBLIC - INA              | 30.6              | 21.3        | 25             | 25                       |
| PUBLIC - MUSTANG          | 27.8              | 18.5        | 23             | 193                      |
| S.STATES - 4483N-ST5      | 27.1              | -           | 22             | 105                      |
| S.STATES - RT4495N        | 26.7              | 19.2        | 18             | 145                      |
| MID ATLANTIC - MA4211nRR  | 26.2              | -           | 17             | 43                       |
| S.STATES - 4299N          | 25.4              | -           | 21             | 153                      |
| MID ATLANTIC - MA4311n    | 25.0              | -           | 21             | 110                      |
| GARST - 4423RR/N          | 25.0              | -           | 22             | 200                      |
| EXPERIMENTAL - MD 95-5358 | 24.2              | 20.0        | 19             | 183                      |
| EXPERIMENTAL - MD 97-6156 | 23.4              | -           | 22             | 115                      |
| PUBLIC - LS 93-0375       | 21.8              | 18.7        | 18             | 130                      |
| PUBLIC - LS 92-4173       | 18.9              | 17.8        | 20             | 138                      |
| VIGORO - V410SCN          | 18.4              | -           | 19             | 131                      |
| EXPERIMENTAL - MD 97-5939 | 18.0              | -           | 19             | 168                      |
| PUBLIC - REND             | 15.5              | 19.6        | 22             | 153                      |
| PUBLIC - STRESSLAND (S)   | 26.3              | 18.9        | 26             | 258                      |
|                           | <b>Mean</b>       | <b>23.8</b> | <b>18.8</b>    | <b>21</b>                |
|                           | <b>LSD (0.20)</b> | <b>4.6</b>  | <b>NS</b>      | <b>2</b>                 |

\*Full Cysts/4 Plants on August 9

\*\* Seed yield not obtained due to deer feeding damage

Table 7. Seed yields (1999 and 2000) and performance of entries of Maturity Groups IV-S and V grown at Pemberton Historical Park in a cyst nematode-infested soil. (Races 1 & 5)

| BRAND - ENTRY              | Seed Yield, Bu/A  |             | Height, Inches | Full Cysts/<br>4 Plants* |            |
|----------------------------|-------------------|-------------|----------------|--------------------------|------------|
|                            | 2000              | 1999        |                |                          |            |
| <b>MATURITY GROUP IV-S</b> |                   |             |                |                          |            |
| PUBLIC - MANOKIN           | 36.5              | 26.3        | 27             | 138                      |            |
| EXPERIMENTAL - MD 96-5275  | 32.1              | 26.9        | 21             | 8                        |            |
| EXPERIMENTAL - MD 96-5472  | 27.7              | 22.7        | 21             | 18                       |            |
| CLARKS - CL47NRR           | 22.9              | -           | 19             | 128                      |            |
| EXPERIMENTAL - MD 97-5010  | 21.8              | -           | 17             | 125                      |            |
| VIGORO - V450NRR           | 21.0              | -           | 20             | 523                      |            |
| PUBLIC - CHESAPEAKE (S)    | 20.8              | -           | 17             | 460                      |            |
|                            | <b>Mean</b>       | <b>29.9</b> | <b>22.8</b>    | <b>24</b>                | <b>105</b> |
|                            | <b>LSD (0.20)</b> | <b>6.3</b>  | <b>3.2</b>     | <b>4</b>                 | <b>61</b>  |
| <b>MATURITY GROUP V</b>    |                   |             |                |                          |            |
| EXPERIMENTAL - MD 96-5502  | 43.2              | 29.5        | 29             | 18                       |            |
| PUBLIC - HARTWIG           | 41.2              | 27.5        | 33             | 5                        |            |
| PUBLIC - DELSOY 5710       | 39.9              | 29.6        | 38             | 20                       |            |
| PUBLIC - FOWLER            | 39.8              | 28.6        | 32             | 33                       |            |
| PUBLIC - ACCOMAC           | 36.8              | 24.5        | 38             | 20                       |            |
| PUBLIC - ANAND             | 34.8              | 33.6        | 27             | 48                       |            |
| PUBLIC - WICOMICO          | 31.8              | 31.7        | 30             | 18                       |            |
| EXPERIMENTAL - V 98-0329   | 29.6              | -           | 27             | 168                      |            |
| EXPERIMENTAL - MD 95-5260  | 29.5              | 23.5        | 25             | 160                      |            |
| EXPERIMENTAL - MD 97-6065  | 28.7              | -           | 26             | 115                      |            |
| EXPERIMENTAL - V 95-0391   | 28.5              | -           | 23             | 103                      |            |
| EXPERIMENTAL - V 97-2659   | 27.0              | -           | 27             | 240                      |            |
| MID ATLANTIC - 5000RR      | 27.0              | -           | 24             | 108                      |            |
| S.STATES - XP5409N         | 27.0              | -           | 26             | 110                      |            |
| S.STATES - RT517N          | 26.2              | 18.0        | 29             | 143                      |            |
| EXPERIMENTAL - V 98-0301   | 26.1              | -           | 26             | 245                      |            |
| EXPERIMENTAL - MD 97-5361  | 24.4              | -           | 29             | 95                       |            |
| VIGORO - V542NRR           | 22.4              | -           | 25             | 195                      |            |
| EXPERIMENTAL - TN 94-213   | 22.3              | -           | 23             | 203                      |            |
| PUBLIC - ESSEX (S)         | 21.0              | 24.0        | 22             | 255                      |            |
| PUBLIC - HUTCHESON (S)     | 33.5              | 20.0        | 28             | 423                      |            |
|                            | <b>Mean</b>       | <b>30.5</b> | <b>26.1</b>    | <b>28</b>                | <b>130</b> |
|                            | <b>LSD (0.20)</b> | <b>5.3</b>  | <b>3.1</b>     | <b>2</b>                 | <b>91</b>  |

\*Full Cysts/4 Plants on August 9