

- IX. YIELD AND GROWTH RESPONSE OF COTTON VARIETIES TO TEMIK 15G FOR CONTROL OF SOUTHERN ROOT KNOT NEMATODE (Rick Morgan Farm, Suffolk, VA)
- A. PURPOSE: To compare the susceptibility of commercial cotton varieties to southern root-knot nematode (*Meloidogyne incognita*) and assess their response to treatment with Temik 15G 5 lb/A in the seed furrow
- B. EXPERIMENTAL DESIGN:
1. Split-plot design with varieties in main plots and subplots with and without Temik 15G
  2. Four randomized complete blocks separated by 15-ft alleyways
  3. Two, 30-ft rows per plot with 38 in. row spacing
  4. Seeding rate of 3 to 3.5 seed/row ft
- C. VARIETY (Main plots):
1. DP 434 RR
  2. DP 444 BG/RR
  3. ST 5599 BR (partially-resistant standard)
  4. ST 5242 BR
  5. DP 451 B/RR
  6. ST 5303 R
  7. DP 455 BR
  8. DP 445 BR
  9. ST 4892 BR
  10. PHY 310R
  11. FM 989 BR
  12. DP 555 BG/RR
  13. ST 4575 BR
  14. DP 432 RR
- D. TREATMENT (Subplots):
1. Untreated
  2. Temik 15G 5 lb/A (in furrow at planting)
- E. ADDITIONAL INFORMATION:
1. Location: Rick Morgan Farm, Deer Forest Rd., Suffolk, VA
  2. Crop history: Cotton 2004-2001, Peanut 2000
  3. Land preparation: Rip and bed rows
  4. Planting date: 10 May 2005
  5. Herbicide: Cotoran 1 pt + Prowl 1 pt/A (12 May)  
Roundup Ultra Max 22 fl oz/A (8 Jun)  
Envoke 0.15 oz + MSMA 1 pt directed between rows (18 Jul)
  6. Insecticide: Orthene 97S 6 oz/A (8 Jun)  
Karate Z 2.56 fl oz (30 Jul)
  7. Growth regulator: Mepex Gin Out 4 oz/A by wick applicator (18 Jul)  
+ 16 oz/A broadcast spray (30 Jul)
  8. Defoliant/Boll opener: Cotton Quick 0.5 gal + Aim 0.5 oz/A
  9. Fertilization: 40 lb N, 30 lb P, 40 lb K broadcast (1 May)  
50 lb N (32% liquid) + Valor 1 lb/A under hoods between rows (18 Jul)
  10. Harvest date: 8 November 2005

Table 30. Effect of variety selection and treatment on emergence, growth and earliness of cotton.

| Treatment, variety and rate/A <sup>1</sup> | Plants/ft <sup>2</sup><br>(Jun 14) | Plant height<br>(in.) <sup>3</sup><br>(Jul 13) | Open bolls <sup>4</sup><br>(Sep 16) | Total bolls <sup>4</sup><br>(Sep 16) |
|--|------------------------------------|--|-------------------------------------|--------------------------------------|
| <b>Variety mean</b>                        |                                    |  |                                     |                                      |
| DP 434 RR .....                            | 1.77 b                             | 23.4 a-c                                       | 1.5                                 | 14.6                                 |
| DP 444 BG/RR.....                          | 1.61 c                             | 24.3 a   | 2.4                                 | 14.0                                 |
| ST 5599 BR.....                            | 1.59 c                             | 22.6 cd  | 0.8                                 | 14.1                                 |
| ST 5242 BR.....                            | 1.55 c                             | 22.8 b-d                                       | 1.1                                 | 16.4                                 |
| DP 451 B/RR.....                           | 1.62 c                             | 23.3 a-c                                       | 1.6                                 | 13.0                                 |
| ST 5303 R .....                            | 1.41 de                            | 21.6 e   | 1.9                                 | 15.2                                 |
| DP 455 BR .....                            | 1.56 c                             | 22.0 de  | 1.6                                 | 18.1                                 |
| DP 445 BR .....                            | 1.78 b                             | 23.6 ab  | 1.0                                 | 14.0                                 |
| ST 4892 BR.....                            | 1.36 e                             | 22.9 b-d                                       | 1.4                                 | 17.1                                 |
| PHY 310R .....                             | 1.66 bc                            | 22.8 b-d                                       | 2.2                                 | 14.1                                 |
| FM 989 BR.....                             | 1.59 c                             | 20.1 f   | 1.0                                 | 15.5                                 |
| DP 555 BG/RR.....                          | 1.91 a                             | 21.6 e   | 1.2                                 | 15.0                                 |
| ST 4575 BR.....                            | 1.54 cd                            | 22.0 de  | 1.3                                 | 14.9                                 |
| DP 432 RR .....                            | 1.78 ab                            | 22.7 b-d                                       | 2.0                                 | 14.7                                 |
| <b>LSD .....</b>                           | <b>0.14</b>                        | <b>0.9</b>                                     | <b>--</b>                           | <b>n.s.</b>                          |
| <b>Treatment mean</b>                      |                                    |  |                                     |                                      |
| Untreated .....                            | 1.72 a                             | 20.1 b   | 1.2                                 | 15.2                                 |
| Temik 15G 5 lb (F) .....                   | 1.53 b                             | 25.0 a   | 1.8                                 | 14.9                                 |
| <b>LSD .....</b>                           | <b>0.05</b>                        | <b>0.4</b>                                     | <b>--</b>                           | <b>n.s.</b>                          |
| <b>Split-plot analysis</b>                 |                                    |  |                                     |                                      |
| Variety .....                              | .0001                              | .0991  | .0373                               | .4961                                |
| Treatment .....                            | .0001                              | .0001  | .0003                               | .5573                                |
| Variety x treatment.....                   | .4882                              | .1263  | .0345                               | .6949                                |

<sup>1</sup> F=in furrow.<sup>2</sup> Determined from counts of two, 30-ft rows per plot.<sup>3</sup> Data represent measurements of four randomly-selected plants per plot.<sup>4</sup> Data represent counts of four plants per plot.

Means in groups followed by the same letter(s) in a column are not significantly different according to Fisher's Protected LSD (P=0.05). "n.s." = not significant; "--" denotes LSD not valid due to significant variety by treatment interaction.

Table 31. Effect of variety selection and treatment on nematode populations and root galling of cotton.

| Treatment, variety and rate/A     | Root-knot nematodes/500 cc soil* |                     | Root galling** (0-6) |                     |
|-----------------------------------|----------------------------------|---------------------|----------------------|---------------------|
|                                   | Untreated                        | Temik 15G<br>5 lb/A | Untreated            | Temik 15G<br>5 lb/A |
| DP 434 RR .....                   | 3615                             | 4113                | 2.6 de               | 1.6 ef              |
| DP 444 BG/RR.....                 | 3595                             | 5113                | 3.1 cd               | 1.9 d-f             |
| ST 5599 BR.....                   | 1868                             | 3925                | 2.3 e                | 1.3 f               |
| ST 5242 BR.....                   | 4245                             | 3328                | 2.9 c-e              | 2.4 cd              |
| DP 451 B/RR.....                  | 3205                             | 4883                | 2.8 c-e              | 1.9 d-f             |
| ST 5303 R .....                   | 2685                             | 5673                | 2.6 de               | 2.6 cd              |
| DP 455 BR .....                   | 3073                             | 3918                | 4.1 ab               | 2.5 cd              |
| DP 445 BR .....                   | 3945                             | 3393                | 3.9 ab               | 3.0 bc              |
| ST 4892 BR.....                   | 3175                             | 3823                | 3.4 bc               | 3.7 ab              |
| PHY 310R .....                    | 7015                             | 7233                | 4.3 a                | 3.6 ab              |
| FM 989 BR.....                    | 6168                             | 7083                | 2.8 c-e              | 2.1 de              |
| DP 555 BG/RR.....                 | 5343                             | 4850                | 3.9 ab               | 3.9 a               |
| ST 4575 BR.....                   | 4983                             | 2203                | 4.3 a                | 3.7 ab              |
| DP 432 RR .....                   | 1883                             | 3383                | 4.3 a                | 3.9 a               |
| <b>LSD.....</b>                   | <b>n.s.</b>                      | <b>n.s.</b>         | <b>0.8</b>           | <b>0.7</b>          |
| <b><i>Treatment mean</i></b>      |                                  |                     |                      |                     |
| Untreated.....                    |                                  | 3914                |                      | 3.4                 |
| Temik 15G 5 lb/A .....            |                                  | 4494                |                      | 2.7                 |
| <b>LSD.....</b>                   |                                  | <b>n.s.</b>         |                      | <b>--</b>           |
| <b><i>Split-plot analysis</i></b> |                                  |                     |                      |                     |
| Variety .....                     |                                  | .1063               |                      | .0001               |
| Treatment .....                   |                                  | .0589               |                      | .0001               |
| Variety x treatment.....          |                                  | .7087               |                      | .0022               |

\* Soil was sampled 19 Aug.

\*\* Rating scale: 0=none, 1=10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of root system with galls and females laying eggs. Data are from four randomly-selected plants per plot on 14 Nov.

Means in groups followed by the same letter(s) in a column are not significantly different according to Fisher's Protected LSD (P=0.05). Square root transformation of population data was made in analysis of nematode populations to determine statistical significance. "n.s." = not significant; "--" denotes LSD not valid due to significant variety by treatment interaction.

Table 32. Effect of variety selection and treatment on yield of cotton.

| Treatment, variety and rate/A     | Yield*     |                |             |                |
|-----------------------------------|------------|----------------|-------------|----------------|
|                                   | lb/A       |                | bales/A     |                |
|                                   | Untreated  | Temik 15G 5 lb | Untreated   | Temik 15G 5 lb |
| DP 434 RR .....                   | 2640 d     | 3159 ab        | 2.34 cd     | 2.80 a-c       |
| DP 444 BG/RR.....                 | 2746 b-d   | 3176 ab        | 2.49 a-d    | 2.85 ab        |
| ST 5599 BR.....                   | 3090 a     | 3354 a         | 2.70 a      | 2.90 a         |
| ST 5242 BR.....                   | 3033 ab    | 3196 ab        | 2.59 a-c    | 2.76 a-c       |
| DP 451 B/RR.....                  | 3113 a     | 2969 bc        | 2.53 a-c    | 2.38 de        |
| ST 5303 R .....                   | 2694 cd    | 2600 d         | 2.25 d      | 2.19 e         |
| DP 455 BR .....                   | 2680 d     | 2709 cd        | 2.43 a-d    | 2.43 de        |
| DP 445 BR .....                   | 3015 a-c   | 3313 a         | 2.64 ab     | 2.97 a         |
| ST 4892 BR.....                   | 2752 b-d   | 2972 bc        | 2.41 b-d    | 2.63 b-d       |
| PHY 310R .....                    | 2646 d     | 3133 ab        | 2.40 b-d    | 2.81 a-c       |
| FM 989 BR.....                    | 2875 a-d   | 2998 bc        | 2.37 b-d    | 2.47 d         |
| DP 555 BG/RR.....                 | 2640 d     | 2815 cd        | 2.36 b-d    | 2.55 cd        |
| ST 4575 BR.....                   | 3012 a-c   | 3259 ab        | 2.64 ab     | 2.85 ab        |
| DP 432 RR .....                   | 3070 ab    | 3305 a         | 2.62 ab     | 2.93 a         |
| <b>LSD .....</b>                  | <b>331</b> | <b>298</b>     | <b>0.28</b> | <b>0.26</b>    |
| <b><i>Treatment mean</i></b>      |            |                |             |                |
| Untreated.....                    | 2857 b     |                | 2.48        |                |
| Temik 15G 5 lb/A .....            | 3068 a     |                | 2.68        |                |
| <b>LSD.....</b>                   | <b>77</b>  |                | <b>--</b>   |                |
| <b><i>Split-plot analysis</i></b> |            |                |             |                |
| Variety .....                     | .0001      |                | .0001       |                |
| Treatment .....                   | .0001      |                | .0001       |                |
| Variety x treatment.....          | .0650      |                | .0444       |                |

\* Weight (lb/A) includes lint + seed; bales/A are lint only. Lint weight (480 lb/bale) was determined by ginning 1-lb. samples of seed cotton from each variety. Plots were harvested on 8 Nov 2005.

Means followed by the same letter(s) in a column are not significantly different according to Fisher's Protected LSD (P=0.05). "--" denotes LSD not valid due to significant variety by treatment interaction.