

**DELTA AND HILL TEST RESULTS WITH PENTIA  
PLANT GROWTH REGULATOR, MISSISSIPPI, 2003**

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**Abstract**

Test results indicate that Pentia improves yield by 213 pounds of lint per acre and net revenue by \$133.75 per acre when compared to a zero Pentia check. A second test indicated that Pentia improved yield by 72 pounds of lint per acre and revenue by \$44.92 per acre when compared to generic Pix.

**Introduction**

The purpose of this paper is to report the results of two Pentia tests in Mississippi in 2003. The test in the non-delta or hill section of Mississippi was in the northern Brown Loam. Experimental design was a split field. The two treatments were Pentia (16 ounces per acre at early bloom) and check (no Pentia). Yield estimates were based on 50 feet of row, which was machine harvested with a two-row plot picker (sample size = 100 row feet) and converted to yield per acre assuming 35% lint turn-out. The treatment samples were paired and analyzed as a paired t-test ( $P = 0.05$ ). The variety was DP451. Defoliation was Prep plus DEF. Plant map data was taken from 100 plants per treatment after defoliation.

The second test was located in the south Delta. A uniform field was divided into 12 blocks of known size and with the same expected yield. Alternate blocks were assigned in sequence to the two treatments. Treatment 1 was generic Pix (check) and Treatment 2 was Pentia. The blocks were large enough so that the seedcotton was moduled separately. Yields were obtained from gin records. The treatment samples were paired and analyzed as a paired t-test ( $P = 0.05$ ). The variety was DP555BR. Defoliation was Dropp plus Prep, followed by DEF plus Prep.

The grower was instructed to apply the two treatments on the same day at the same rate (ounce per ounce). Three applications of ten, eight, and eight ounces, beginning shortly prior to first bloom, were applied to both treatments. A final application of 12 ounces was applied to the generic Pix blocks, but was not applied to the Pentia blocks. Hence, the treatments were three applications of Pentia, totaling 26 ounces, versus four applications of generic Pix, totaling 38 ounces.

Economic analysis requires the use of selected prices. Prices are reported in Table 1. Additionally, we assume 1.55 pounds of cottonseed per pound of lint. Competition for plant growth regulators in the Midsouth market has been very competitive, and reasonable individuals may disagree with the selected prices employed in this report.

**Results and Discussion**

We say visual cut-out has occurred when the last green boll that might be harvested as an open boll is easily identified. It will be the youngest (uppermost) boll remaining on the plant, and all branches above that boll will have aborted all of their fruit. There will be no squares, blooms, or green bolls that are smaller than the boll in the cut-out position. The cut-out position is recorded as the number of the mainstem node associated with the youngest remaining green boll.

The boll-opening event is a proxy for earliness. It is recorded as the height of the last open boll (youngest open boll). It is recorded as the mainstem node which contains the last open boll. All fruiting sites below the youngest open boll will be vacant or occupied by older open bolls.

Table 2 records the average cut-out position and height of the open boll for the Pentia test in the hill area of Mississippi. The cut-out position associated with the Pentia treatment was lower on the plant than the check. The reader is cautioned that the cut-out position associated with check is specific to the date recorded and likely moved lower prior to harvest. (To be discussed as a part of Table 3). The height of the open boll varied almost three mainstem nodes for the two treatments, indicating that the Pentia treatment was more mature (on that mapping date) by approximately nine days (assumes three days between mainstem nodes). Midsouth growers that can initiate harvest nine days earlier in late September or early October will likely complete harvest a month prior to those initiating harvest nine days later.

Table 3 reports the number of fruiting sites, missing sites, open bolls, and green bolls per 100 plants for the two treatments in the hill area of the Mississippi area. This data is specific to the date sampled. Specifically, the number of green bolls may significantly decline from sampling date to harvest as cut-out becomes more pronounced.

As expected, the Pentia treatment has fewer fruiting sites than the generic Pix treatment, and fewer missing sites, or fruiting sites that contain no fruit. The Pentia treatment had a missing fruit percentage of 47.36 percent compared to 50.56 percent for the check. On September 25, the Pentia treatment had 644 open bolls per 100 plants versus 281 for the check treatment. The number of green bolls in the Pentia treatment were 430 compared to 762 for the check treatment. The number of open plus green bolls on September 25 was 1,074 for Pentia versus 1,043 for the check treatment. Based on the yields reported in Table 4, which were obtained approximately two and a half weeks after the plant mapping data, many of the green bolls in the check treatment were aborted prior to harvest.

The improvement in net returns per acre associated with the Pentia treatment is calculated as  $213 * \$0.60 + 1.55 * 213 * \$0.05 - 16 * \$0.66 = \$133.75$ .

Table 5 lists the yield estimates obtained for the Pentia versus generic Pix test in the Delta area of Mississippi. All of the yield differences favored the Pentia treatment. The improvement in yield ranged from 60 to 82 pounds of lint per acre, and averaged 72 pounds of lint per acre. The difference is statistically significant. The improvement in net revenue is estimated as  $72 * \$0.60 + 72 * 1.55 * \$0.05 - (26 * \$0.66 - 38 * \$0.35) = \$44.92$ .

Table 1. Assumed Selected Prices, Mississippi, 2003.

| Item        | Unit   | Price   |
|-------------|--------|---------|
| Pentia      | Gallon | \$85.00 |
| Pentia      | Ounce  | 0.66    |
| Generic Pix | Gallon | 45.00   |
| Generic Pix | Ounce  | 0.35    |
| Cotton Lint | Pound  | 0.60    |
| Cotton Seed | Pound  | 0.05    |

Table 2. Average cut-off position and height of highest open boll, Pentia plant growth regulator test, Hill Area, Mississippi, September 25, 2003.

|                     | Pentia | Check |
|---------------------|--------|-------|
| Cut-out position    | 15.20  | 15.55 |
| Height of open boll | 12.44  | 9.48  |

Table 3. Number of fruiting sites (FS), missing fruiting sites (X), open bolls (Ø) and green bolls (B) per 100 plants, Pentia plant growth regulator test, Hill Area, Mississippi, 9-25-03.

|       | Pentia | Check |
|-------|--------|-------|
| FS    | 2040   | 2110  |
| X     | 966    | 1067  |
| Ø     | 644    | 281   |
| B     | 430    | 762   |
| O + B | 1074   | 1043  |

Table 4. Yield (pounds of lint per acre), Pentia plant growth regulator test, Hill Area, Mississippi, 2003.

| <b>Pair</b> | <b>Pentia</b> | <b>Check</b> | <b>Diff.</b> |
|-------------|---------------|--------------|--------------|
| 1           | 1240          | 997          | 243          |
| 2           | 1249          | 994          | 255          |
| 3           | 1124          | 1004         | 120          |
| 4           | 1208          | 972          | 236          |
| Av.         | 1205          | 992          | 213          |

Table 5. Yield (pounds of lint per acre), Pentia plant growth regulator test, Delta Area, Mississippi, 2003.

| <b>Pair</b> | <b>Pentia</b> | <b>Generic Pix</b> | <b>Diff.</b> |
|-------------|---------------|--------------------|--------------|
| 1           | 1361          | 1301               | 60           |
| 2           | 1410          | 1333               | 77           |
| 3           | 1422          | 1351               | 71           |
| 4           | 1380          | 1316               | 64           |
| 5           | 1344          | 1262               | 82           |
| 6           | 1323          | 1244               | 79           |
| Av.         | 1373          | 1301               | 72           |