County-Based Early Warning Program for Micronaire Estimation Utilizing the Hal Lewis Procedure for Predicting Field Micronaire

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RESEARCH PROBLEM

The timing of defoliation is critical to insure optimum yield and fiber quality. The use of micronaire testing to determine the optimum time to defoliate can reduce the risk of discounts from high micronaire. A program such as the Hal Lewis method (Lewis, 1994) can be invaluable to producers in Arkansas to avoid discounts associated with micronaire.

BACKGROUND INFORMATION

Discounts associated with high micronaire are significant. It has been reported that producers lost about 100 million dollars to high micronaire discounts alone from the 2001 crop (Lewis, 2002). Approximately 25% of this loss was from the mid-South. A tool such as the Hal Lewis method is very effective in predicting the micronaire values by measuring that of the lowest four first-position open bolls and factoring in the proposed defoliation timing. This procedure can be very time consuming and sample collection must follow protocol exactly.

RESEARCH DESCRIPTION

The objective of this study was to determine whether the Hal Lewis method was consistent across various locations in northern, central, and southeast Arkansas and across cultivars at the same locations. Samples where collected from 93 fields with 13 different cultivars, which covered 12 counties in eastern Arkansas. Four areas from each field where sampled. Each sample was hand picked and consisted of all the open first-position bolls from the first four fruiting branches. Seed cotton was open, fluffed, and dry when picked for a sample. Eight plants were sampled from each of the four

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sample sites. Samples were ginned and classed for micronaire. Based on the micronaire from the results of the fiber analysis, a predicted micronaire was assigned to that field. Micronaire values were adjusted according to the procedures set forth in the Hal Lewis method based on temperatures during boll fill.

**RESULTS**

No significant differences were seen for the predicted micronaire versus the actual field micronaire across the locations sampled. Variability observed between 13 cultivars sampled did not vary significantly among one another or across location. The average of the 93 fields sampled were within 0.02 of the state’s average of 4.60 from the 1.65 million bales harvested from 920,000 acres (Table 1). Micronaire in the discountable range of 5.0 to 5.2, and 5.3 and greater for the fields sampled was also comparable to the state’s average. Location and cultivar were determined not to be a factor in predicting micronaire across the state.

**PRACTICAL APPLICATION**

The Hal Lewis method seems to be an effective tool that could be used across various regions in Arkansas. Samples collected from 93 fields with 13 different cultivars across 12 counties in Arkansas closely mirrored the cotton fiber quality of the state’s 920,000 harvested acres with regards to micronaire as reported by USDA/AMS. The program provides great potential in identifying the levels of risks for high micronaire on a regional basis coupled with the widespread practice of monitoring NAWF for crop termination as a component of COTMAN. We hope to expand this program in 2003.

**LITERATURE CITED**


**Table 1. Comparisons of 93 fields sampled from 12 counties encompassing 13 cultivars to that of the 2002 state average for micronaire-related fiber quality parameters.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sampled fields</th>
<th>State average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average micronaire</td>
<td>4.82</td>
<td>4.60</td>
</tr>
<tr>
<td>Discount range 5.0 to 5.2</td>
<td>10.34%</td>
<td>16.90%</td>
</tr>
<tr>
<td>Discount range 5.3 and greater</td>
<td>1.60%</td>
<td>4.00%</td>
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</tbody>
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