The Influence of COTMAN on the Arkansas Cotton Research Verification Program

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RESEARCH PROBLEM

The utilization of COTMAN has varied depending on the users’ objectives. Consultants may only be interested in the BOLLMAN component, while researchers may be interested in season-long SQUAREMAN data. These adaptations have made it difficult to estimate utilization and benefit to Arkansas producers.

BACKGROUND INFORMATION

One way to evaluate the effect of COTMAN on Arkansas cotton production would be to observe its impact on the Cotton Research Verification Program (CRVP). Since the inception of the CRVP in 1980, the program has strived to train extension personnel and clientele on University of Arkansas recommendations. Through the early 1990’s, the potential of COTMAN was easily recognized, although COTMAN was only in the developmental stage. As the software was refined it became an integral component of the CRVP and currently serves as a fundamental tool of the program. Beyond the obvious implications for educators, growers, and consultants, COTMAN has been vital in the development of an on-farm database (Table 1). These data continue to provide insight into the verification of cotton recommendations.

RESEARCH DESCRIPTION

Since 1995, COTMAN data have been collected in 86 irrigated CRVP fields. Extension agents, producers, consultants, and CRVP personnel have collected COTMAN data for the program. These data served as the basis for in-season production recommendations.

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RESULTS AND DISCUSSION

The benefits of late-season pest management and defoliation timing have received the most attention and have been instrumental in increasing grower profitability. Extension clientele across the state have adopted these recommendations although many outside of the CRVP have not realized the full potential of the software.

SQAREMAN has been a valuable early-season management tool. The CRVP has utilized this component of COTMAN to validate early-season insect and irrigation recommendations. The data collected for SQUAREMAN have provided an illustration of the penalties associated with non-recommended plant bug applications and delayed irrigation. Recognition of the detrimental effects of these practices have greatly facilitated the training efforts of the CRVP and helped to instill grower confidence in current recommendations. The BOLLMAN component of COTMAN has also reinforced University of Arkansas recommendations. The CRVP has utilized the graphical evidence of crop pace to instruct producers and consultants in methods to manipulate crop stress. A heavy boll load has been shown to prevent excessive vegetative growth. Consequently, growers and consultants in the program have refrained from making pre-determined plant growth regulator (PGR) applications and have realized the need for late-season fertility and irrigation. In the absence of boll associated stress, vegetative growth has been discouraged with PGR applications.

Growers are able to speed up or slow down crop development to ensure earliness or maximize production while increasing net returns (Figs. 1 and 2). Although this is common in today’s CRVP, it was a risky venture prior to the development of COTMAN.

PRACTICAL APPLICATION

COTMAN has served as a selling point for the CRVP. Through the years the CRVP has enjoyed increased grower interest due to the software. An advanced understanding of the software has typically resulted in a better understanding of cotton physiology and helped change the mindset of producers and consultants. Prior to COTMAN a cotton consultant was primarily an insect scout. Today’s consultant is expected to make recommendations consistent with the goals of COTMAN.

ACKNOWLEDGMENTS

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Summaries of Arkansas Cotton Research 2006

Table 1. CRVP COTMAN data from 2004 and 2005 at physiological cutout.

<table>
<thead>
<tr>
<th>Season</th>
<th>County</th>
<th>Variety</th>
<th>Planting</th>
<th>Cutout</th>
<th>Nodes</th>
<th>Boll</th>
<th>Total shed</th>
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<tbody>
<tr>
<td>2004</td>
<td>Crittenden</td>
<td>ST4892 BR</td>
<td>5 May</td>
<td>21 July</td>
<td>16.3</td>
<td>19.5</td>
<td>13.4</td>
</tr>
<tr>
<td>2004</td>
<td>Lee</td>
<td>DP 444 B/RR</td>
<td>6 May</td>
<td>25 July</td>
<td>16.7</td>
<td>14.9</td>
<td>8.7</td>
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<tr>
<td>2004</td>
<td>Lonoke</td>
<td>ST5599 BR</td>
<td>6 May</td>
<td>31 July</td>
<td>16.4</td>
<td>10.0</td>
<td>5.7</td>
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<td>2004</td>
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<td>5 May</td>
<td>1 Aug</td>
<td>18.0</td>
<td>40.2</td>
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<td>2004</td>
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<td>19.9</td>
<td>47.3</td>
<td>29.6</td>
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</tbody>
</table>

Projected date of physiological cutout based upon 30-yr average temperatures.
Data collected on 1 August 2005.

Fig. 1. The pattern of crop development from standard management compared to the target development curve.

Fig. 2. The curve for accelerated management compared to the target development curve.