Development of the COTVAR Variety Selection Program

Fred M. Bourland and D.C. Jones

RESEARCH PROBLEM

Other than variation in transgenic technologies and seed treatment, costs of cotton planting seed are relatively constant. However, choosing the best cotton variety to plant can often determine whether the producer experiences a successful production year. The producer must assume that past performance of varieties is a good predictor of future performance. Generally, the best cotton variety to plant in the forthcoming year is the one that performs best over a wide range of environments. A computer program is needed to summarize variety test data from multiple states.

BACKGROUND INFORMATION

The advent of transgenic varieties, increased number of seed suppliers, and rapid turnover of varieties has provided growers a greater choice and the opportunity to choose a more productive variety. However, sorting through the large number of varieties has become very difficult. The task of sorting becomes even more daunting when a grower tries to compare results from different states. State Cotton Variety Trials have been conducted in approximately 15 states for decades. The results are published and made available in hard copy. On-line delivery of data has recently become available to growers. However, growers need a user friendly and customized delivery approach to allow comparisons to be made that are most relevant to them. The COTVAR variety selection program is a product that makes this a reality.

RESEARCH DESCRIPTION

Programming of COTVAR began in 2006 and came on-line in February 2007. Currently, COTVAR includes state variety test data from five states (Arkansas, Louisiana, Mississippi, Missouri, and Tennessee) for 2004 through 2006. Locations were

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1 Director, Northeast Research and Extension Center, Keiser; and program director, Cotton Incorporated, Cary, N.C., respectively.
Summaries of Arkansas Cotton Research 2006
coded, grouped into regions, and described with regard to soil type, irrigation, and GPS coordinates. A total of about 30 test sites per year with up to four experiments per test site is included.

Varieties were uniformly coded over locations then described relative to status (available, experimental line, or obsolete) and status (multiple transgenes, single transgene, or conventional). Mean data for lint yield, lint percentage, height, open boll percentage, seed index, lint index, seed per acre, leaf pubescence rating, fiber length, uniformity, micronaire, and strength were recorded. Also, a quality index (Q-score) was calculated by assigning different weights to normalized values of four fiber parameters. The Q-score may vary from 0 to 100, with higher values indicating lines with fiber quality that should meet market demands.

Programming of COTV AR has been done via the University of Arkansas Cooperative Extension Service initially by Chalmers Davis and then completed by Becky Bridges.

RESULTS AND DISCUSSION

Screens generated by the COTV AR program include:
1. Opening page. Introduction to COTV AR with hyperlinks to variety testing Web sites (Arkansas, Louisiana, Missouri, Mississippi, and Tennessee) and to Cotton Incorporated.
2. Step 1. Select year. As presently structured, the user must access one year at a time. The three most recent years are available as options.
3. Step 2. Select variety status. Each variety is characterized as being commercially available, experimental line, or obsolete. The user may select any or all status categories. Hyperlinks to the status categories are provided. Seed companies periodically update the status of their varieties.
4. Step 3. Select variety type. Each variety is characterized regarding transgenes as possessing multiple traits, single traits or none (conventional). The user may select any or all type categories. Hyperlinks to the type categories are provided.
5. Step 4. Select variety test locations. The user may select regions or choose to go to the next screen to pick specific sites. Use of multiple locations is encouraged.
6. Step 4, screen 2. All test locations are listed from north to south by state and region within states. Soil type, whether irrigated, and GPS coordinates of locations are listed. The user may pick any number of specific locations to be summarized.
7. Step 5. Select varieties for comparison. All varieties for status and type chosen are listed in the left column. The additional columns list experiments for states chosen and provide the number of locations where each variety was evaluated. Varieties are then sorted by number of variety by experiments (high to low), so the most frequently tested varieties are listed first. The user may then choose up to five varieties to compare.
8. Step 6. Output screen 1. Average yield, lint fraction, quality score, and fiber properties for selected varieties over all test locations are given, along with number of test sites used in calculations. Hyperlinks may be accessed to define the parameters.
9. Step 7. Output screen 2. Yields (as percentage of experiment means) for the chosen varieties are listed for each chosen test site. The sites are sorted by average experimental means from high to low. This chart allows the user to see how consistent the varieties performed at the different locations, and how they may have performed at relatively high and low yielding sites.

10. Step 8. Output screen 3. Additional parameters are listed for the selected varieties. These parameter means are not specific to the chosen test sites, but are averages over all sites where data for the parameters are recorded.

**PRACTICAL APPLICATION**

COTVAR may be accessed at [http://cotvar.uaex.edu/Intro.asp](http://cotvar.uaex.edu/Intro.asp) and is available to anyone. COTVAR is not a substitute for variety test publications, but is useful to summarize variety test data. As such, it should be helpful to producers and to seed companies. Work has been initiated to establish data files for all other states that conduct cotton variety tests. Prior to incorporating these additional data into COTVAR, we will: 1) establish and assign a region to each test location, 2) develop descriptive information on test locations, 3) confirm variety names and determine variety status for varieties not in current variety list, and 4) make changes to programming to include the additional states and regions.

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