CONTRIBUTORS

Akin, D. Scott, Extension Entomologist, Southwest Research and Extension Center, Monticello
Avila, Carlos A., Graduate Assistant, Crop, Soil, and Environmental Sciences Department, Fayetteville
Bibi, Androniki C., Graduate Assistant, Crop, Soil, and Environmental Sciences Department, Fayetteville
Bourland, Fred M., Director, Northeast Research and Extension Center, Keiser
Bryant, Kelly J., Director, Southwest Research and Extension Center, Monticello
Bullington, Jeremy A., Weed Science Program Technician, Southwest Research and Extension Center, Monticello
Capps, Charles D., County Extension Agent - Agriculture, Drew County, Monticello
Colwell, C. Kyle, Seasonal Agricultural Technician, Cooperative Extension Service, Little Rock
Daniel, Tommy C., Professor, Crop, Soil, and Environmental Sciences Department, Fayetteville
Doherty, Ryan C., Program Technician, Southwest Research and Extension Center, Monticello
Driggs, Keith, Technical Service Representative, Syngenta Crop Protection, north Little Rock
Gonias, Evangelos D., Graduate Assistant, Crop, Soil, and Environmental Sciences Department, Fayetteville
Goodson, Robert, Cooperative Extension Agent - Agriculture, Phillips County, Helena
Goodwin, Harold L., Professor, Department of Agricultural Economics and Agribusiness, Fayetteville
Greene, Jeremy K., Associate Professor, Research - Cotton Entomologist, Edisto Research and Education Center, Clemson University, Blackville, S.C.
Griffith, Griff M., Graduate Research Assistant, Crop, Soil, and Environmental Sciences Department, Fayetteville
Groves, Frank E., Cotton Research Verification Program Coordinator, Southwest Research and Extension Center, Monticello
Hamilton, Mike, County Extension Agent - Agriculture, Crittenden County, Marion
Hardke, Jarrod T., Seasonal Agricultural Technician, Cooperative Extension Service, Little Rock
Hendrix, Bill, Research Assistant, Crop, Soil, and Environmental Sciences Department, Fayetteville
Herron, Cindy G., Research Specialist, Soil Testing and Research Laboratory, Marianna
Howard, Eric, Entomology Program Technician, Southwest Research and Extension Center, Monticello
Kawakami, Eduardo, Graduate Assistant, Crop, Soil, and Environmental Sciences Department, Fayetteville
Kemper, Nathan P., Program Associate I, Department of Agricultural Economics and Agribusiness, Fayetteville
Lancaster, Shawn W., Program Technician - Entomology, Northeast Research and Extension Center, Keiser
Loka, Dimitra, Graduate Assistant, Crop, Soil, and Environmental Sciences Department, Fayetteville
Long, Josh, Program Technician I, Soil Testing and Research Lab, Marianna
Lorenz, Gus M., III, Extension Entomologist, Cooperative Extension Service, Little Rock
Mattice, John D., Research Associate Professor, Crop, Soil, and Environmental Sciences Department, Fayetteville
Meier, Jason R., Program Technician, Southeast Research and Extension Center, Monticello
Mozaffari, Morteza, Research Assistant Professor, Soil Testing and Research Lab, Marianna
Nichols, Robert L., Senior Director - Agricultural Research, Cotton Incorporated, Cary, N.C.
Norsworthy, Jason K., Associate Professor, Crop, Soil, and Environmental Sciences Department, Fayetteville
Norton, Chad, Cooperative Extension Agent - Staff Chair, Lincoln County, Star City
Oosterhuis, Derrick M., Distinguished Professor, Crop, Soil, and Environmental Sciences Department, Fayetteville
Oliver, Lawrence R., University Professor, Crop, Soil, and Environmental Sciences Department, Fayetteville
Osborne, Jason, County Extension Agent - Agriculture, Crittenden County, Marion
Purcell, Larry C., Professor, Crop, Soil, and Environmental Sciences Department, Fayetteville
Reeves, Jeanne M., Director of Agricultural Research, Cotton Incorporated, Cary, N.C.
Reiter, Mark S., Technical Assistant II, Crop, Soil, and Environmental Sciences Department, Fayetteville
Roberts, Bruce A., Associate Professor, Department of Plant Science, California State University, Fresno, Calif.
Robertson, William C., Extension Agronomist - Cotton, Crop, Soil, and Environmental Sciences Department, Little Rock
Rothrock, Craig S., Professor, Plant Pathology Department, Fayetteville
Schmid, Brian, Cooperative Extension Agent, Crittenden County, Marion
Scott, Robert C., Extension Weed Scientist, Cooperative Extension Service, Lonoke
Shelton, Craig, Graduate Assistant, Cooperative Extension Service, Little Rock
Slaton, Nathan A., Associate Professor, Crop, Soil, and Environmental Sciences Department, Fayetteville
Smith, Kenneth L., Extension Weed Specialist/Professor, Southeast Research and Extension Center, Monticello
Snider, John L., Graduate Assistant, Crop, Soil, and Environmental Sciences Department, Fayetteville
Stephenson, Daniel O., IV, Assistant Professor, Northeast Research and Extension Center, Keiser
Stewart, James McD., University Professor, Crop, Soil, and Environmental Sciences Department, Fayetteville
Stone, Steven, Cooperative Extension Agent - Agriculture, Lincoln County, Star City
Studebaker, Glenn E., Extension Entomologist, Northeast Research and Extension Center, Keiser
Teague, Tina G., Professor, Department of Agronomy and Entomology, Arkansas State University, Jonesboro
Tingle, Christopher H., Weed Control Group Leader, Syngenta Crop Protection, Vero Beach Research Center, Vero Beach, Fla.
Toksoz, Harun, Graduate Assistant, Plant Pathology Department, Fayetteville
Von Kanel, Ben, Graduate Assistant, Crop, Soil, and Environmental Sciences Department, Fayetteville
Wilf, Heather, Program Associate-Entomology, Cooperative Extension Service, Lonoke
Zhou, Zinguo G., Visiting Scientist, Crop, Soil, and Environmental Sciences Department, Fayetteville
CONTENTS

Contributors .............................................................................................................. 2
Preface ......................................................................................................................... 10
Arkansas Cotton Research Group ............................................................................. 13
Acknowledgments ....................................................................................................... 13
Cotton Achievement Award ...................................................................................... 14
Cotton Incorporated and the Arkansas State Cotton
Support Committee .................................................................................................... 16

SUMMARIES OF ARKANSAS COTTON RESEARCH 2007

University of Arkansas Cotton Breeding Program -
2007 Progress Report
Fred M. Bourland ....................................................................................................... 21

Relationships of Yield Component Variables to Yield and Fiber
Quality Parameters
Frank E. Groves and Fred M. Bourland ....................................................................... 24

Performance of VipCot in Arkansas, 2007
Gus M. Lorenz, III, D. Scott Akin, Kyle Colwell,
Glenn E. Studebaker, Heather Wilf, Craig Shelton,
Ben Von Kanel, and Keith Driggs ............................................................................... 28

Effect of Phosphorus Deficiency on Cotton Growth
Derrick M. Oosterhuis, Androniki C. Bibi,
Evangelos D. Gonias, and Morteza Mozaffari ...................................................... 32

Effect of Phosphorus Deficiency on Cotton Physiology
Derrick M. Oosterhuis, Androniki C. Bibi,
Evangelos D. Gonias, and Morteza Mozaffari ...................................................... 35

Cotton Response to Phosphorus Application
in a Commerce Silt Loam
Morteza Mozaffari, Nathan A. Slaton, Josh Long,
Jason Osborn, Mike Hamiltons, and B. Schmid .................................................... 39
Effect of Baled Poultry Litter and Urea on Cotton at Multiple Locations  
Morteza Mozaffari, Nathan A. Slaton, H.L. Goodwin,  
Josh Long, Nathan Kemper, and Cindy Herron ......................... 43

Seedcotton Yield from Applications of Nitrogen-Fortified Poultry Litter Granular Fertilizers  
Mark S. Reiter, Tommy C. Daniel, and Morteza Mozaffari ....... 48

Effect of Various Seeding Patterns and Rates on Cotton Growth and Yield  
Daniel O. Stephenson, IV, Fred M. Bourland,  
and Shawn W. Lancaster ............................................................ 53

Effect of High Night Temperatures on Cotton Respiration, ATP Content, and Carbohydrates  
Dimitra A. Loka and Derrick M. Oosterhuis ............................. 58

Radiation Use Efficiency of Okra- and Normal-Leaf Cotton Isolines  
Evangelos D. Gonias, Derrick M. Oosterhuis,  
and Androniki C. Bibi................................................................. 64

Radiation Use Efficiency of Cotton in Contrasting Environments  
Evangelos D. Gonias, Derrick M. Oosterhuis,  
Androniki C. Bibi, and Bruce A. Roberts ................................. 68

Cotton Growth Radiation Use Efficiency Response to Plant Growth Regulators  
Evangelos D. Gonias, Derrick M. Oosterhuis,  
and Androniki C. Bibi................................................................. 72

Estimating Light Interception by the Cotton Crop Using a Digital Imaging Technique  
Evangelos D. Gonias, Derrick M. Oosterhuis,  
Androniki C. Bibi, and Larry C. Purcell ................................. 75

Exogenous Application of Putrescine on Cotton Ovaries Under Two Temperature Regimes  
Androniki C. Bibi, Derrick M. Oosterhuis  
Evangelos D. Gonias, and John D. Mattice ................................. 79
Effect of the Plant Growth Regulator BM86 on Seed-Set Efficiency and Yield of Cotton
Androniki C. Bibi, Derrick M. Oosterhuis, and Evangelos D. Gonias ......................................................... 84

Effect of 1-MCP on the Physiology and Yield of Cotton
Eduardo M. Kawakami, Derrick M. Oosterhuis, and John L. Snider ............................................................. 90

Effect of 1-MCP on Water Relations Parameters of Well-Watered and Water-Stressed Cotton Plants
Eduardo M. Kawakami, Derrick M. Oosterhuis, and John L. Snider ................................................................. 96

Effect of 1-MCP on Antioxidants, Enzymes, Membrane Leakage, and Protein Content of Drought-Stressed Cotton Plants
Eduardo M. Kawakami, Derrick M. Oosterhuis, and John L. Snider ................................................................. 102

Effect of 1-MCP on Ethylene Synthesis and Development of Cotton Flowers Under Normal and High Temperatures
Eduardo M. Kawakami, Derrick M. Oosterhuis, and John L. Snider ................................................................. 108

Final Irrigation Timing 2007—COTMAN and Crop Termination in Arkansas Cotton
Tina Gray Teague ................................................................................................................................. 114

Physiological Mechanism of Nitrogen Mediating the Growth of Cotton Seedlings under Water-Stress Conditions
Zhiguo G. Zhou and Derrick M. Oosterhuis ......................................................................................... 123

Efficacy of Seed Treatment Chemicals, Including Fungicides and Host Resistance Inducers, in Controlling the Black Root Rot Pathogen, Thielaviopsis basicola, on Cotton
Harun Toksoz and Craig S. Rothrock ................................................................................................. 129

Evaluation of Reflex and Valor for Preplant and Preemergence Control of Palmer Amaranth in Cotton
Ryan C. Doherty, Kenneth L. Smith, Daniel O. Stephenson, IV, Jason K. Norsworthy, Jeremy A. Bullington, and Jason R. Meier ................................................................. 133
Sensitivity of Palmer Amaranth in Northeast Arkansas to a Labeled Rate of Glyphosate
   Jason K. Norsworthy, Kenneth L. Smith, Robert C. Scott, and Lawrence R. Oliver......................... 136

Variability in Response of Palmer Amaranth to Glyphosate in Northeast Arkansas
   Jason K. Norsworthy, Kenneth L. Smith, Robert C. Scott, and Lawrence R. Oliver............................ 141

Performance of Selected Insecticides for Control of Tarnished Plant Bug (Lygus lineolaris) in Southeast Arkansas
   D. Scott Akin, Eric Howard, Gus M. Lorenz III, Glenn E. Studebaker, and Kyle Colwell............................. 146

Efficacy of Endigo ZC: a New Insecticide for Cotton in Arkansas, 2007
   Kyle Colwell, Gus M. Lorenz, III, Heather Wilf, Craig Shelton, Robert Goodson, Eric Howard, and Glenn E. Studebaker...... 151

Efficacy of Selected Compounds for Control of Heliothines in Arkansas Cotton
   Heather Wilf, Gus M. Lorenz, III, Kyle Colwell, Craig Shelton, Robert Goodson, Eric Howard, Steven Stone, Chad Norton, and Ben Von Kanel.......................... 155

Gene Expression Changes Induced by Reniform Nematode Infection in Cotton Roots
   Carlos A. Avila and James McD. Stewart................................. 159

Effect of Antimicrobial Peptides (AMPS) on Micorrhizal Associations
   James McD. Stewart, Camila Nader; and Kanniah Rajesekaran......................................................... 163

Valuing Transgenic Cotton Technologies Using a Risk/Return Framework
   Kelly J. Bryant, Jeanne M. Reeves, Robert L. Nichols, Jeremy K. Greene, Christopher H. Tingle, Glenn E. Studebaker; Fred M. Bourland, Charles D. Capps, Jr., and Frank E. Groves .......... 167
Appendix I
Student Theses and Dissertations Related to
Cotton in Progress in 2007 ...................................................... 171

Appendix II
Research and Extension 2007 Cotton Publications ................. 173
Arkansas’ cotton producers reduced acreage approximately 29% to 850,000 acres of cotton in 2007. The reduction in acres was a direct result of increased commodity prices, mainly for corn. Cotton producers averaged 1,062 lb lint/acre in 2007. This was the second highest yield on record for Arkansas and 17 lb/acre on average higher than the 2006 crop. The highest yield recorded for the state was 1,114 lb lint/acre in 2004. For the last four seasons, cotton producers in Arkansas have averaged over 1,000 lb lint/acre and ranked second for the last three years behind Texas in United States cotton production. Arkansas produced 1.8 million bales of cotton in 2007.

The 2007 growing season started off rough for many producers across Arkansas. Colder temperatures causing a late April freeze resulted in many acres of replanted corn. The cooler temperatures also delayed cotton planting for the first time in many years. However, conditions improved and the bulk of the 2007 crop was planted during the first and second week of May. Cotton emerged quickly with warm temperatures and with these warmer temperatures, emergence was more even than the last few seasons. Environmental conditions were excellent for cotton early, which resulted in quick growth and high fruit retention going into bloom. Rainfall patterns were scattered throughout the state in 2007. The northeast portion experienced droughty conditions, while in some areas of southeast Arkansas, irrigation pumps were not turned on until late July or early August due to frequent rainfall.

Production problems in 2007, other than the extreme dry conditions in the northeast, were mostly pest-related. The increased acreage of corn surrounding cotton fields resulted in extremely heavy infestations of tarnished plant bugs. Many producers suffered yield losses from plant bugs where fields bordered corn. In some cases, threshold levels were reached every time the fields were scouted, resulting in numerous sprays to control re-infestations of plant bugs. Glyphosate-resistant weeds continued to be a problem that plagued cotton fields. This past season numerous fields were sampled and found to contain populations of glyphosate-resistant pigweed. Management of glyphosate-resistant weeds will continue to be a major challenge in the future of Arkansas cotton production.

Overall, 2007 was a good year for cotton production in Arkansas. However, increased costs of production, mainly fuel and fertilizer, reduced profit margins in many areas. Producers needed to average close to 1200 lb/acre to break even in 2007.

Tom Barber and Derrick Oosterhuis
Fig. 1. Weekly maximum and minimum temperatures and rainfall for 2007 compared with the long-term 35-year averages in eastern Arkansas.
ARKANSAS COTTON RESEARCH GROUP

2007/2008

The University of Arkansas Cotton Group is composed of a steering committee and three sub-committees representing production, genetics, and pest management. The group contains appropriate representatives in all the major disciplines as well as representatives from the Cooperative Extension Service, the Farm Bureau, the Agricultural Council of Arkansas, and the State Cotton Support Committee.

The objective of the Arkansas Cotton Group is to coordinate efforts to improve cotton production and keep Arkansas producers abreast of all new developments in research.

Steering Committee: Don Alexander, Fred M. Bourland, Frank Groves, Gus Lorenz, Gene Martin, Robert McGinnis, Derrick M. Oosterhuis (Chm.), Craig Rothrock, James McD. Stewart, and David Wildy.

Pest Management: Terry L. Kirkpatrick, Gus Lorenz, Randy Luttrell, Jason Norsworthy, Craig Rothrock (Chm.), Kenneth L. Smith, Don Steinkraus, Glenn Studebaker, and Tina Teague.

Production: Sreekala Bajwa, Kelly Bryant, Mark Cochran, Leo Espinoza, Dennis Gardisser, Frank Groves, Gus M. Lorenz, Morteza Mozaffari, Jason Norsworthy, Derrick M. Oosterhuis (Chm.), Lucas Parsch, Daniel Stephenson, and Phil Tacker.

Genetics: Fred M. Bourland, Hal Lewis, and James McD. Stewart (Chm.).

ACKNOWLEDGMENTS

The organizing committee would like to express appreciation to Marci Milus for help in typing this special report and formatting it for publication.
The Arkansas Boll Weevil Eradication Foundation (ABWEF) was established by legislation, Act 10 of the 1991 Arkansas State Legislature, for the purpose of eliminating the boll weevil from Arkansas. The eradication of the boll weevil was and still is a national program designed to eliminate the boll weevil north of Mexico. Eradication of the boll weevil from the southeastern states has allowed resurgence of cotton production from Virginia to Florida, and only Texas now produces more cotton than Georgia. Prior to implementation of the Boll Weevil Eradication Program, the states of the southeast were not considered as major players in cotton circles.

The members of the ABWEF are cotton producers from five regions of the state. The Board currently has nine members including the Director of the State Plant Board. Six of the members are new appointees, replacing members that had served from the beginning. The ABWEF is the vehicle that has given the Arkansas cotton farmer the benefit of a boll weevil-free growing season. Without the eradication of the boll weevil, and especially with the current input costs of seed, fuel, and fertilizer for the crop, cotton would not be grown in Arkansas today.

The program revenues are as follows: 71% paid by cotton producers ($131,000,000), 25% by USDA Aphis ($46,000,000), and 4% by the State of Arkansas ($7,500,000). With total income of $199,730,000 and total expenses of $218,616,000, this leaves a deficit of $18,886,000 that the producers will pay through fees. In recent years the approximate annual revenue for cotton production was $832,536,407. An average yield increase of 200 to 300 lb/acre has occurred during the eradication program.

The ABWEF has developed and implemented a program that has played a leadership role in saving an important segment of Arkansas Agriculture. For this reason the Arkansas Boll Weevil Eradication Foundation was elected to receive the 2007 Arkansas Cotton Achievement Award for their contribution to Arkansas cotton. While the individuals named below were responsible for implementation of the program, many individuals (too numerous to name here) were responsible for the day-to-day operation of the eradication program.

The current, former, and non-voting members of the ABWEF are as follows:

**CURRENT**

- Ritter Arnold (Chairman, Dec. 03 - present)  
- Laudies Brantley (Secretary / Treasurer)  
- Trent Felton (Vice-Chairman)  
- Glenn Brackman  
- Bobby Gammill  
- Darryl Little  
- Joe Mencer  
- Kenneth Qualls  
- Randy Reynolds  

- Marked Tree  
- England  
- Marianna  
- Bradley  
- Tyronza  
- Little Rock  
- Lake Village  
- Lake City  
- Blytheville
### FORMER

<table>
<thead>
<tr>
<th>Name</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don Alexander (replaced by Darryl Little)</td>
<td>Little Rock</td>
</tr>
<tr>
<td>Mark Bryles (replaced by Randy Reynolds)</td>
<td>Blytheville</td>
</tr>
<tr>
<td>Joe Burns (Chairman, April 1996 - December 2003)</td>
<td>Rector</td>
</tr>
<tr>
<td>Jack Carey (Chairman, April 1991 - April 1996) (replaced by Joe Mencer)</td>
<td>Dumas</td>
</tr>
<tr>
<td>Hal Hyneman (replaced by Bobby Gammill)</td>
<td>Jonesboro</td>
</tr>
<tr>
<td>Gerald King (replaced by Don Alexander)</td>
<td>Little Rock</td>
</tr>
<tr>
<td>Perry Stratton (Chairman April 2002 - December 2003) (replaced by Laudies Brantley)</td>
<td>Pine Bluff</td>
</tr>
<tr>
<td>Charles Tillmon (replaced by Glenn Brackman)</td>
<td>Pine Bluff</td>
</tr>
</tbody>
</table>

### NON-VOTING

<table>
<thead>
<tr>
<th>Name</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bill Yearian (first member)</td>
<td>Fayetteville</td>
</tr>
<tr>
<td>Don Johnson (replaced Dr. Yearian)</td>
<td>Cabot</td>
</tr>
<tr>
<td>Gus Lorenz (current, replaced Dr. Johnson)</td>
<td>Little Rock</td>
</tr>
</tbody>
</table>
COTTON INCORPORATED AND
THE ARKANSAS STATE SUPPORT COMMITTEE

The Summaries of Arkansas Cotton Research 2007 has been published with funds supplied by the Arkansas State Support Committee through Cotton Incorporated.

Cotton Incorporated’s mission is to increase the demand for cotton and improve the profitability of cotton production through promotion and research. The Arkansas State Support Committee is comprised of the Arkansas directors and alternates of the Cotton Board and the Cotton Incorporated Board, and others whom they invite, including representatives of certified producer organizations in Arkansas. Advisors to the Committee include certain staff members of the University of Arkansas, the Cotton Board, and Cotton Incorporated. Seven and one-half percent of the grower contributions to the total Cotton Incorporated budget are allocated to the State Support Committees of the cotton-producing states. The sum allocated to Arkansas is proportional to the states’ contribution to the total U.S. production and value of cotton fiber over the past five years.

The Cotton Research and Promotion Act is a federal marketing law. The Cotton Board, based in Memphis, Tennessee, administers the act, and contracts implementation of the program with Cotton Incorporated, a private company with its world headquarters in Cary, North Carolina. Cotton Incorporated also maintains offices in New York City, Los Angeles, Mexico City, Osaka, Hong Kong, and Shanghai. Both the Cotton Board and Cotton Incorporated are not-for-profit companies with elected boards. Cotton Incorporated’s board is comprised of cotton growers, while that of the Cotton Board is comprised of both cotton importers and growers. The budgets of both organizations are reviewed annually by the U.S. Secretary of Agriculture.

Cotton production research in Arkansas is supported in part by Cotton Incorporated directly from its national research budget and also by funding from the Arkansas State Support Committee from its formula funds (Table 1). Several of the projects described in this series of research publications, including publication costs, are supported wholly or partly by these means.
### Arkansas Cotton State Support Committee / Cotton Incorporated Funding 2007.

<table>
<thead>
<tr>
<th>Projects</th>
<th>Researcher</th>
<th>Short title</th>
<th>$ Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>02-291AR</td>
<td>Oosterhuis</td>
<td>Annual Research Summaries</td>
<td>$6,500</td>
</tr>
<tr>
<td>04-439AR</td>
<td>Kirkpatrick</td>
<td>Reniform nematode biology-Ark.</td>
<td>$18,488</td>
</tr>
<tr>
<td>05-630AR</td>
<td>Cochran</td>
<td>Economics of N &amp; K Fertilization</td>
<td>$34,114</td>
</tr>
<tr>
<td>05-631AR</td>
<td>Baker</td>
<td>Remote sensing for scouting</td>
<td>$8,549</td>
</tr>
<tr>
<td>05-632AR</td>
<td>Savage</td>
<td>Liberty-Link vs. RoundupReady</td>
<td>$16,000</td>
</tr>
<tr>
<td>05-634AR</td>
<td>Robertson</td>
<td>Optimal defoliation timing</td>
<td>$19,140</td>
</tr>
<tr>
<td>06-797AR</td>
<td>Lorenz</td>
<td>Plant bug thresholds</td>
<td>$21,520</td>
</tr>
<tr>
<td>07-973AR</td>
<td>Bourland</td>
<td>Cotton breeding</td>
<td>$26,804</td>
</tr>
<tr>
<td>07-974AR</td>
<td>Hogan</td>
<td>Irrigation start and stop</td>
<td>$23,780</td>
</tr>
<tr>
<td>07-975AR</td>
<td>Espinoza</td>
<td>Gypsum</td>
<td>$23,715</td>
</tr>
<tr>
<td>07-976AR</td>
<td>Lorenz</td>
<td>Bt technology</td>
<td>$25,565</td>
</tr>
<tr>
<td>07-977AR</td>
<td>Oosterhuis</td>
<td>High temperature effects</td>
<td>$15,975</td>
</tr>
<tr>
<td>07-978AR</td>
<td>Groves</td>
<td>Verification program - SE</td>
<td>$31,073</td>
</tr>
<tr>
<td>07-979AR</td>
<td>Rothrock</td>
<td>Black root rot</td>
<td>$19,916</td>
</tr>
<tr>
<td>07-980AR</td>
<td>K. Smith</td>
<td>Palmer amaranth</td>
<td>$19,661</td>
</tr>
<tr>
<td>07-981AR</td>
<td>Stephenson</td>
<td>15-inch rows</td>
<td>$24,035</td>
</tr>
<tr>
<td>07-986AR</td>
<td>Oosterhuis</td>
<td>Cuticle penetration</td>
<td>$4,165</td>
</tr>
</tbody>
</table>

**TOTAL** |  |  | **$339,000** |
SUMMARIES OF
ARKANSAS COTTON RESEARCH
— 2007 —