

*Annual
Report*

*North
Mississippi
Research
and
Extension
Center*

2000



NOTICE TO USER

This Mississippi Agricultural and Forestry Experiment Station Information Bulletin is a summary of research conducted at the branch stations of the North Mississippi Research and Extension Center. These include the North Mississippi Branch Experiment Station in Holly Springs, Northeast Mississippi Branch Experiment Station in Pontotoc, and Prairie Research Unit in Prairie. It is intended for the use of colleagues, cooperators, and sponsors. The interpretation of data presented herein may change after additional experimentation. Information included herein is not to be construed either as a recommendation for use or as an endorsement of a specific product or variety by Mississippi State University or the Mississippi Agricultural and Forestry Experiment Station.

This report contains data generated as part of the Mississippi Agricultural and Forestry Experiment Station research program. Cooperating personnel are listed on pages 8-9.

Trade names of commercial products used in this report are included only for clarity and understanding. Any experimental pesticides were used in accordance with EPA Experimental Use Regulations [40CFR 172.3 (Section 5) of FIFRA].

The complete 2000 Annual Report is available at the North Mississippi R&E Center Web site:

www.msstate.edu/dept/nmrec

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PERSONNEL

<u>NAME</u>	<u>TITLE</u>	<u>COMMODITY EXPERTISE</u>	<u>LOCATION</u>
Dr. Reuben Moore	Head, NMREC	Dairy, Administration	Verona
<u>DISTRICT LEADERS</u>			
Robert McNeil	MSU-ES District Program Director	Family/Youth/ Administration	Verona
Dickie Rhea	MSU-ES District Program Director	Agriculture	Verona
<u>SCIENTISTS, PROJECT LEADERS, SPECIALISTS</u>			
Dr. Normie Buehring	Research Scientist/Supt.	Agronomy – Soybeans Cotton, Weed Control, Corn, Conserv. Tillage	Verona
Tracy Brown	Facilities Coordinator		Verona
Dr. Robert Carter	Extension Specialist	Forestry	Verona
Dr. Kent Cushman	Research Scientist	Vegetable crops Small Fruits Medicinal Herbs	Verona
Dr. Rick Evans	Research Scientist MSU-ES Specialist	Beef Cattle	Prairie
Mike Howell	Area Livestock Specialist	Livestock	Verona
Dr. Roscoe Ivy	Research Scientist	Agronomy crops – Forages	Prairie
Dr. Joe Johnson	Research Scientist	Cotton	Holly Springs
Dr. Lelia Kelly	Northeast Area Agent	Horticulture	Verona
Linda Mitchell	Family and Youth Coord.	MSU-ES	Verona, Lee Co.
Donald Pogue	Asst. Supt./Dairyman	Dairy	Holly Springs
Dr. Mark Shankle	Research Scientist	Agronomy	Pontotoc
R. C. Sloan	Research Scientist	Ornamentals	Verona
Dr. Paul Thompson	Research Scientist MSU-ES Specialist	Sweetpotato	Pontotoc
John Huston	Facilities Coordinator	Beef cattle	Prairie
Judith Ward	Special Programs Coordinator		Verona
Dr. Mike Williams	MSU-ES Specialist	Entomology	MSU
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Tim Best	Research Assistant	Beef cattle, Agronomy	Prairie
Barbara Briscoe	Secretary	Administrative MAFES-MSU-ES	Verona
Lawrence Byrd	Technician	Farm Labor	Holly Springs
Judy Butler	Secretary	Specialists	Verona
Willie Carter	Farm Laborer	Beef cattle	Prairie
Willie Clay	Farm Laborer	Beef cattle	Prairie
Barbara Curry	Secretary	MCES Administration	Verona
Robert Dobbs	Research Assistant	Agronomy crops	Verona
Tim Foster	Technician	Agronomy crops	Verona
Nancy Green	Secretary	MAFES	Holly Springs
Susan Harkness	Research Assistant	Horticulture – Ornamentals	Verona
Jerry Haulcomb	Technician	Agronomy crops	Verona
Ann Hinds	Secretary	MSU-ES	Verona
Willie Hogan	Farm Laborer	Beef Cattle, Agronomy	Prairie

<u>NAME</u>	<u>TITLE</u>	<u>COMMODITY EXPERTISE</u>	<u>LOCATION</u>
Thomas Horgan	Research Assistant	Horticulture – Vegetables	Verona
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Louis Lawrence	Farm Laborer	Dairy, Agronomy crops	Holly Springs
Russell Lawrence	Farm Laborer	Dairy, Agronomy crops	Holly Springs
Dr. Muhammad Maqbool	Research Assistant	Horticulture	Verona
Jeff Main	Research Assistant	Sweetpotatoes	Pontotoc
Charles McGregor	Farm Laborer	MAFES	Pontotoc
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Shelia Norwood	Secretary	MAFES – MSU-ES	Pontotoc
Mark O'Bryant	Technician	MAFES	Prairie
Joyce Pace	Secretary	MAFES	Prairie
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James Poe	Farm Laborer	MAFES	Prairie
Tommy Rhine	Farm Laborer	MAFES	Holly Springs
Thaddeus Riley	Research Assistant	Dairy, Agronomy crops	Holly Springs
Jerry Sartin	Technician	Agronomy crops	Pontotoc
James Saunders	Research Assistant	Agronomy crops	Holly Springs
Nathan Spearman	Technician	Horticulture	Verona
Randy Swords	Technician	Agronomy crops	Pontotoc
Sam Tackitt	Maintenance Technician	Agronomy crops	Pontotoc
Tommy Winter	Farm Laborer	Farm Laborer	Holly Springs

MSU-ES AGRICULTURAL EXTENSION AGENTS- NORTHEAST DISTRICT

Brian Atkins	County Agent	MSU-ES	Lowndes Co.
Scott Cagle	County Agent	MSU-ES	Montgomery Co.
Steve Cummings	County Agent	MSU-ES	Yalobusha Co.
Ricky Ferguson	County Agent	MSU-ES	Pontotoc Co.
Charlie Fitts	County Agent	MSU-ES	Calhoun Co.
Dalton Garner	County Agent	MSU-ES	Prentiss Co.
Ronald Jones	County Agent	MSU-ES	Marshall Co.
Perry Kimbrough	County Agent	MSU-ES	Clay Co.
Tim Needham	County Agent	MSU-ES	Tippah Co.
Patrick Poindexter	County Agent	MSU-ES	Alcorn Co.
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Dr. Dennis Reginelli	County Agent	MSU-ES	Noxubee Co.
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Jonathan Tidwell	County Agent	MSU-ES	Chickasaw Co.
Glen Williams	County Agent	MSU-ES	Oktibbeha Co.
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COOPERATING PERSONNEL
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Assistant Director - Marty Fuller
Assistant Director - Nancy Cox

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Entomology & Plant Pathology

Clarence Collison, Head
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Carla Seifker
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Rodney Christmas

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Northeast District Program Director - R. A. McNeil
Northeast District Program Director - Dickie Rhea

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Wildlife & Fisheries

Marty W. Brunson, Leader

Agricultural Engineering

Jim G. Thomas, Leader
Herb Wilcutt

Animal & Dairy Sciences

Mark Crenshaw
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Allen Williams

Agronomy & Weed Science

Will McCarty, Leader
Alan Blaine
John Byrd
Eric Larson

Horticulture

David Nagel
David Tatum

Entomology and Plant Pathology

Clarence Collison, Head
James Jarrett
Frank Killebrew
Mike Williams

2000 OVERVIEW
NORTH MISSISSIPPI RESEARCH AND EXTENSION CENTER
Reuben Moore, Head

2000 was a great year for the North Mississippi Research and Extension Center (NMREC). Three more outstanding new faculty members were added, more research projects were initiated, grants and grant proposals were up and scholarly publications increased. New extension educational programs were also established and others were expanded. We have made great strides in developing our web page. The use of our distance learning center has increased and there is great potential for even greater use. Our faculty and support staff has done a great job in providing programs and meeting research needs of our clientele.

The present physical properties of NMREC and their primary mission are as follows:

- Central Office, Verona, MS—Department Headquarters, District Extension Offices, Extension Specialist offices and MAFES faculty offices for Horticulture Unit and Northeast Mississippi Branch Experiment Station.
- Horticulture Research Unit, Verona, MS—Ornamental, Turf, Vegetable and Medicinal Herb Research.
- North Mississippi Branch Experiment Station, Holly Springs, MS—Canola, Cotton, Dairy, Wildlife, and Erosion Control Research.
- Northeast Mississippi Branch Experiment Station, Verona, MS—Soybeans, Cotton, Corn and Conservation Tillage Production Systems
- Pontotoc Ridge-Flatwoods Branch, Pontotoc, MS—Sweetpotatoes, Corn, Cotton, Fruits, Forestry and GPS Technology.
- Prairie Research Unit, Prairie, MS—Beef, Canola, Corn, Forages, and Soybean Research.
- Wiley L. Bean Swine Demonstration Unit, Pontotoc, MS

One of the most exciting new research program areas is the medicinal herb project that was initiated in 2000 at Verona. This is a joint project with the National Center for Natural Products Research (NCNPR) at The University of Mississippi. The initial research plant is Mayapple, which is a natural source of podophyllotoxin, a compound from which some anti-cancer drugs are derived. Our primary mission will be to develop production systems with Mayapple and determine its possibilities as a profitable new crop for Mississippi farmers. NCNPR will continue pharmaceutical and other chemical development activities with Mayapple. Initial plantings of Mayapple have been made to compare mulching and propagation techniques. Work on other medicinal herbs will begin within the near future.

Our horticulture program at Verona continues to attract more attention from our clientele. This was the first year for our Fall Garden Day. This was another joint effort with both MAFES and Extension faculty involved. It was a very successful event and offered a tremendous educational program for a large number of attendees. We expect even more growth in the future. We have completed a bridge this year that connects our parking lot to the Magnolia Botanical Gardens. Plans are under way for continued expansion of the Gardens. We also have a “Head House” under construction that will be used by our Horticulture Unit for storage, some laboratory work and many other activities. New turf plots have been established at Verona to address needs of this growing segment of the horticulture industry.

In 2000, there were over 40 agronomic row crop research studies conducted at the Northeast Branch Experiment Station in Verona. There was involvement from several scientists outside our department. We took advantage of the opportunity given by the dry fall months to accomplish additional land forming on some of our acreage used for plot work. This allows us to improve surface drainage, which improves plot data uniformity. We have received a great deal of recognition for our tillage work with agronomic crops. A Row Crops Field Day was held this past summer with over 250 people in attendance. Eighteen commercial exhibitors participated in this event. There were also 28 educational exhibits.

Significant improvements are being made at our Prairie Research Unit. Forage production has been a problem because of dry summers for the past two years. We have been very efficient in resource management and it has allowed us to maintain our beef cattle research program. Results from our investigations with TASC0 (seaweed product) continue to be promising. Proper use of this product can add significant profitability to the beef industry.

Other plans at Prairie include a new working facility that will include a small lab and classroom. This will help facilitate both research and extension programs. The dry and hot weather at Prairie has also negatively affected many of our agronomic plots.

New research areas at our Holly Springs Unit shows tremendous promise for our clientele. We are investigating the use of chicken litter as a nutrient source for cotton. Other trials are planned looking at litter as a nutrient source on pastures and evaluating the amount of run-off from these areas. Our work with the Sedimentation Lab at Ole Miss continues. The construction of a tunnel ventilation facility for research with lactating dairy cattle is almost complete. Data collection is scheduled to begin in early spring. There is significant interest throughout the South in the results of this project.

Our work with virus indexed sweetpotatoes has changed our operation at our Pontotoc Unit. Foundation seed stock produced in 2000 was all virus indexed. Research involving non-virus-indexed sweetpotatoes is now being conducted off the station. We have completed construction of two new greenhouses to accommodate plant production. Dr. Mark Shankle, the new agronomist at the station, has many new projects planned and will continue some of our GPS work there. We are currently working with several scientists from the main campus for expanded research in the areas of Forestry, Aquaculture, Wildlife, and Plant and Soil Sciences.

Our department was again recognized by the MAFES "Outstanding Facility and Grounds Maintenance and Overall Image" committee. The Northeast Branch Station and Horticulture Unit were second in the competition and our Pontotoc Unit won the most improved award. We want our facilities to be ready for clientele visits at all times and our faculty are working hard to accomplish this achievement.

Our extension faculty at NMREC continues to grow. Dr. Lelia Kelly has taken the horticulture area agent position and Dr. Robert Carter is our new Extension Forestry Specialist. Linda Mitchell, Family and Youth Coordinator and Judith Ward, Special Programs Coordinator are now part of our faculty at Verona. We have conducted numerous extension programs in 2000 using our Distance Learning Site or other meeting facilities.

The contents of this document give only a brief overview of our 2000 activities. If you want more detail, I suggest you visit our web site at www.msstate.edu/dept/nmrec.

It is our sincere desire to provide extraordinary service to our clientele. We value your comments and suggestions for our continued improvement. It is our goal to become the research and extension center recognized throughout the Southeast for its outstanding research and extension programs in all commodities where programs exist in this center. Please allow us to fill a need in your area of interest in 2001!

FAMILY AND CONSUMER EDUCATION

Robert McNeil, District Program Director, Family and Youth

MSU Extension Service's Family and Consumer Education program addresses critical issues for individuals and families. Although modern families may take different forms than in the past, it is society's basic institution and is still the dominant influence in a person's life.

Today's families and individuals need help in coping with rapidly changing trends in society. Parents are torn between work and family obligations; they are concerned about financial security, education for their children, and care for elderly parents. With these situations in mind, our efforts focus on individuals and families throughout the life cycle, helping them manage and improve their lives, their environments, and their communities. The underlying goal is to help all Mississippians become healthy, financially secure, and responsible members of society.

Extension Family and Consumer Education information was distributed to 286, 085 individuals in Northeast Mississippi. This was accomplished through 2991 group teaching opportunities, reaching 100, 221. Another 5909 face-to-face contacts through visits, consultations and the delivering of technical assistance reached an additional 24, 396.

Nutrition programs focusing on dietary guidelines and wellness, as well as healthy and cost-effective food purchase storage and preparation, plus a program targeting limited resource families reached some 91,000. An additional 8,500 were reached with food safety and food product information. The required food safety course "Serv Safe" taught to anyone that serves food to the public accounted for the majority of these.

Health education programming providing instruction in basic health needs and self-care skills disseminates vital information on prevention of injury and illness, and training of volunteers in health-related skills reached over 30,000 in our area.

Financial management training to help families manage resources by learning to budget their money, plan for retirement, and make sound decision on savings, credit use, insurance, investments and estate planning reached another 17,000.

Leadership development programs including the Mississippi Homemaker Volunteers, and others which build skills in communication, decision making, problem solving and leadership reached more than 38,000 in the 23 county area.

The remaining contacts were reached through a variety of programs. **Parenting** training for young families taught effective methods for leading children into adulthood. **Child Caregivers** training helped providers of child care to increase their knowledge and skills in positive child development and in the legal and business aspects of child-care management. **Entrepreneurship Development** showed owner of home-based businesses how to develop the marketing, management, business, and technical abilities needed to turn skills and talents into income for the family. **Housing** programs allowed individuals and families to plan for adequate housing through homeownership, rental and lease arrangements, and care and maintenance of existing homes.

Through the efforts of MSU's Extension Service, all Mississippians will have access to information that will help make their communities the best places for their families to live, work and play.

Contact: Robert McNeil, District Program Director – Family and Youth, PO Box 1690, Verona MS, 38879, phone 662-566-2201, or e-mail: robertm@ext.msstate.edu.

4-H YOUTH DEVELOPMENT

Judith Ward, Special Projects Coordinator

4-H is Mississippi State University Extension System's dynamic, nonformal, educational program for today's young people. The program combines the cooperative efforts of youth, volunteer leaders, Mississippi State University and Alcorn State University, federal-state-local governments, and the U.S. Department of Agriculture. The mission of the Mississippi State University Extension System in conducting 4-H programs is to assist youth in developing knowledge, skills, and attitudes that will enable them to become self-directing, productive, and contributing members of society.

The 4-H Vision ...becoming a state leader in developing youth to become productive citizens and catalysts for positive change to meet the needs of a diverse and changing society.

The 4-H's represent these four important areas of youth development:

- **Head** – clearer thinking and decision making. Knowledge useful throughout life.
- **Heart** – greater loyalty, strong personal values, positive self-concept, concern for others.
- **Hands** – larger service, workforce preparedness, useful skills, science and technology literacy.
- **Health** – better living, healthy lifestyles.

Youth in Northeast Mississippi 4-H

Youth participated in the following ways:

4,025 youth were members of 292 4-H community-based clubs.

- 35,337 youth were involved in Youth Development
- 16,193 youth were involved in livestock projects and activities
- 5,350 youth were involved in Human Nutrition, Food Safety & Health projects and activities
- 6,666 youth participated in Wildlife and Fisheries projects and activities
- 13,276 youth participated in Leadership Development
- 5,497 youth participated in Economic/Community Development
- 20,453 youth were involved in Child/Youth Families at Risk programs
- 1,601 youth participated in Consumer Education Project and program

Volunteers in 4-H

Volunteers are essential to the successful delivery of 4-H programs to youth. In 2000 there were 926 adult volunteer leaders working directly and indirectly with youth.

The average 4-H adult volunteer donates 220 hours per year in preparing for club meetings and teaching youth. Each volunteer drives an average 300 to 400 miles for 4-H in a personally-owned vehicle and spends \$40 to \$60 annually on teaching materials. Estimated value of the total time volunteers devote to the 4-H plus their out-of-pocket expenses is about \$6,000,000.

The 4-H Value Set

- We believe that *youth development* is the focus of everything we do.
- We believe that *partnerships* are essential to successful youth development.
- We believe that *volunteerism* is fundamental.
- We believe in the strength attained from *diversity* across the entire range of 4-H experiences.

Contact: Judith Ward, Special Projects Coordinator, PO Box 1690, Verona MS, 38879,
phone 662-566-2201, or e-mail judithw@ext.msstate.edu .

AGRONOMY AND LANDOWNERSHIP

Dickie Rhea, District Program Director/Agriculture and Natural Resources

Extension means education, and staff members in each county prepare and deliver educational programs for producers, landowners, homeowners and youth. This past year, over 168,000 adults participated in more than 17,300 educational activities presented in the 23 counties in Extension's Northeast District.

These activities provided information on the production of numerous agricultural commodities, such as beef cattle, cotton, grain crops, swine, poultry, wildlife, catfish and horticultural crops. Emphasis was placed on managing risk, crop production systems, effective marketing, safety, land ownership issues for under-served timber owners, legal issues for women, and the production of quality beef. Special activities were held to identify potential new extension customers and emerging issues that will shape agriculture in this new century.

Extension agents use an advisory council process that allows producers to grow as leaders through identifying community needs, planning activities to meet those needs, and serving as resource people to help others. Due to skills developed in their county, several of our producers also placed well in the state's young farmer programs sponsored by the Mississippi Farm Bureau Federation.

This advisory process has also been used on the district level. Over 250 producers representing 13 commodities important to our district met at the Producer Advisory Committee meeting. This annual event has been held for over 25 years, and is a model for many states for bringing producers, researchers, Extension specialists and university faculty together to focus research and teaching efforts on problems producers face.

As technology changes, many of our teaching methods change. This year saw a growth in distance education programming, which uses interactive video to allow presenters and their audience (though at different locations) to see, hear and talk to each other. Digital cameras have also allowed agents to take pictures of plants, insects and diseases, send them electronically to a specialist at Mississippi State University, and have the specimen identified almost immediately. These and other technologies will continue to be explored and used to provide more rapid and accurate response to the needs of county producers.

Agronomy – The 2000 crop year was very difficult for producers, with weather and markets severely impacting producer profits. A special program on Risk Management was presented to state producers through distance education. Other activities stressed variety selection, fertility and pest control practices that could reduce input and increase profits. Producers reported savings of over \$500,000 in production costs by using this information.

Commercial Fruit & Vegetable Production - Horticulture crops continue to grow in importance, bringing significant income to producers in several counties. Extension efforts targeted new producers (vegetable, turf, and ornamentals) in several counties. If these efforts and ideas become reality, the district's Ag income will increase over \$500,000 annually.

Container Recycling – Several pesticide container recycling programs were held for producers in the state, sending over two million pesticide containers to be recycled. In our district, over 12,000 pounds were recycled this year, reducing potential contaminants to landfills by almost 100 gallons.

Lady Landowners – Females tend to outlive males in our society. This trend finds many ladies managing lands that had once been overseen by their spouse, brother, or father. This landowner group is growing in number and strength, yet is under-served in educational programming. This year, programs specifically for lady landowners were designed and offered in eight counties. These programs discussed legal issues (wills, estates, contracts, etc.) and introduced the attendees to local resources. Over 190 landowners participated in the events, taking home valuable information that will help them retain and manage their family properties.

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LIVESTOCK

Mike Howell, Northeast Area Livestock Agent

Monthly Newsletter - The Northeast District Livestock Link newsletter has been expanded to 11 issues to County Agents and 6 issues to 4-H Youth Agents. This focus of the county agents newsletter is to provide updated information on current topics or issues. The county agents Livestock Link newsletter is available to producers at their request. Likewise, the 4-H agents newsletter provides 4-H youth agents with timely information to use in their 4-H livestock program. The southeast livestock magazines and tabloids also run segments of the newsletter in their monthly issues.

North Mississippi Beef Agribition - The 2000 North Beef Agribition's fourth annual sale was held in March. The BCIA Commercial Heifer sale had the largest increase in participation. Producers selling heavy-bred commercial heifers were well satisfied with the \$826 average per lot. Total numbers for the BCIA bull sale were down, but this sale averaged \$1250 per lot, \$90 above last year's sale average.

The registered Angus and Brangus sales also saw an increase in the average price paid per lot. The Angus sale was up by \$125 from 1999 and the Brangus sale averaged \$375 more than the 1999 sale. A new dimension will be added to the 2001 Beef Agribition. The BCIA Bull and Heifer Sales will be broadcast over satellite through the services of Superior Satellite Video Auction in Texas. This will allow producers from all areas of Mississippi to consign bulls or commercial heifers and allow producers to get national exposure and a larger bidding audience.

Integrated Resource Management (IRM) - IRM continues to be the tool producers are using to get a complete analysis of their beef cattle farms. IRM participants have access to a team of specialists to develop a plan of action for each area of the farm the IRM analysis identifies as non-profitable. Twelve IRM herds are currently enrolled in the Northeast Mississippi area. One producer on IRM saw weaning weights move from 465 pounds in 1999 to 585 pounds in the 2000 calf crop. Some IRM participants are considering forming an alliance to take advantage of more marketing options. The IRM program is open to all cattlemen through the local county agent's office.

Artificial Insemination Shortcourse - Improved genetic selection is clearly the most economical way to increase calf performance in North Mississippi herds. More and more commercial and registered producers are turning to Artificial Insemination as a management tool to utilize the best bulls in the beef industry. In 1999, 14 people from North and Central Mississippi learned how to artificially inseminate cattle in the Mississippi State University Animal and Dairy Science Department Artificial Insemination Shortcourse. The 2000 shortcourse had 28 people enrolled and others were turned away due to limited space. The shortcourse is a combined effort with the Prairie Research Unit at Prairie Miss. This annual shortcourse is held in October or November each year at the Prairie Unit. The evaluations from the 2000 class indicated this shortcourse would benefit their cattle farm by a minimum of \$1000 each year.

Beef Cattle Shortcourse via Distance Learning Network - The second annual Distance Learning Beef Shortcourse was hosted at 12 locations throughout Mississippi. One hundred thirty nine producers participated in the three class sessions. The North Mississippi Research and Extension Center was one of two sites offered to producers this year in North Mississippi. Limited time and travel dollars prevent MSU Animal and Dairy Science specialists from going to each county in the state to deliver in-depth information on specific topics of interest to cattlemen. The technology age has allowed the Distance Learning Network to be created where producers can travel a short distance to a downlink site to participate in the statewide shortcourse. This year the topics of discussion were Understanding EPDs, Heifer Development and Ensuring Reproductive Success in your Beef Herd.

Farm to Feedlot Project - The Mississippi State University Animal and Dairy Science Department shipped over 800 head of Mississippi producers' feeder calves in October to Hitch II feedlot in Garden City, Kansas. This is the eighth year of this program, with producers being profitable six of the past seven years. This project allows producers to consign five or more head in the program which is designed to give them a better understanding of retained ownership and how well their calves perform in the feedlots and how well they will grade on the rail. Twelve producers from Extension's Northeast District counties are participating in the 2000/2001 Farm to Feedlot program.

4-H Youth Livestock Activities - 4-H youth livestock activities continue to attract new 4-H'ers and their families into this program. The 2000 Dixie National Jr. Round-Up offered two new events for youth: The Premiere Exhibitor Contest for youth in beef, dairy, sheep and swine, and the Beef Grooming Contest. In the 4-H Horse program, the Hippology Contest was another non-riding activity added to give more youth an opportunity to participate in the State 4-H Show. A renewed interest is being placed on livestock and horse activities for youth that do not own an animal for the show ring. The show ring continues to be a very integral part of 4-H livestock and horse program, although youth are now three and four generations removed from the farm and often do not have the facilities or land resources to accommodate a project animal. The emphasis this year in the Northeast District 4-H Youth Livestock and Horse program was to include activities such as the skillathon, cook-off, beef, dairy and horse bowls, and judging contest at local and district livestock and horse events. In addition, other activities, in the Northeast District, during 2000 for 4-H youth, included a one-day Dairy Camp and a two-day Horse Camp.

On The Drawing Board - The livestock industry continues to change at record speed. Marketing quality feeder calves with herd health and carcass information has become increasingly important. Buyers pay more when this information is available and when truckload lots are assembled. A move is underway in Alcorn, Prentiss and Tippah counties to form a marketing alliance with producers wanting to pool their feeder calves and sell in truck load lots (50,000 pounds). These producers are currently working with their county agents, the Animal and Dairy Science Department Specialists at Mississippi State University, and the Area Livestock Agent to 1) identify the breed make-up of the herds in the three-county area, 2) determine what changes in the breeding programs will become necessary to produce like kind and similar aged feeder calves, and 3) explore marketing options (retained ownership, local auction barns, video auctions, internet auctions, off-the-farm sale) to develop the most profitable plan.

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FORESTRY AND FOREST PRODUCTS

Tim Traugott, Area Forestry Specialist

Forestry – Timber is the top Ag commodity in our district, generating over \$10 million in several counties. Forestry associations now exist in 22 of the 23 counties, and provide training programs for timber owners.

Extension agents presented over 50 educational programs for landowners, with the value of the information being estimated at over \$6 million, almost \$13,000 per participant. Several activities were targeted to under-served clientele. These field days and workshops provided practical management information and introduced attendees to local resource people.

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HORTICULTURE

Lelia Scott Kelly, Area Horticulturist

Status of Industry - The horticulture industry in Mississippi encompasses vegetable and fruit production, turf, floriculture and ornamentals. The latter three categories are collectively known as the "Green Industry." Retail nurseries, nursery dealers, woody ornamental and shade tree producers, green house growers, florists, landscapers, landscape maintenance firms, turf, and arborists are included in the "Green Industry."

The Mississippi Green Industry has a production value of over \$50 million and is recognized as the fastest growing segment of the horticulture industry in the state. There are 599 nurseries in Mississippi comprising 7,350 acres. One hundred twenty-nine of those are located in Northeast Mississippi. This represents twenty-one percent of the state total.

Northeast Mississippi has a population in excess of 600,000 and is experiencing above average growth. Informal surveys conducted at the North Mississippi Garden Expo indicate that people are very interested in obtaining horticulture information. North Mississippi has an active and growing Green Industry with the second largest wholesale nursery in the state located in Tippah County. Horticulture revenues from this county alone are over \$1million.

The potential for growth in this industry is enormous with projections of production value by the year 2005 exceeding \$100 million. The direct and indirect activity related to sales, distribution and use of horticultural products and services adds \$2.5 million to the economy of Mississippi. If additional educational and technical assistance resources are provided this economic activity could exceed \$3 million by 2005.

Mississippi State Extension has recognized the need to support and promote this industry. As a result of Extension and industry efforts a plan of action, the "Grow Green Initiative" was developed and funding was appropriated by the legislature.

A portion of this funding was used to hire an Area Horticulturist who began work in July in the Northeast District. Responsibilities of the horticulturist include providing educational programs and assistance to industry clientele, county Extension personnel, consumers, and youth.

District Extension Horticulture Activities

Agent Skills Enhancement

- In-service training in insect/disease identification and treatment, basic landscape design, 4-H Junior Master Gardener program, and water gardening
- Master Gardeners training and management
- Seasonal and regional horticulture information is provided on a weekly basis.
- Establishment of Agent Horticulture Advisory Council to complement the Industry Advisory Council
- Assistance in dealing with the tremendous amount of queries concerning home horticulture (it was determined that many agents are spending up to 70% of their time dealing with this one area)

Program Planning and Development

- Two advanced trainings for Master Gardeners have been scheduled for 2001.
- A weekly e-mail containing seasonal horticulture information for North Mississippi is being sent to all agents in the district
- The Industry Advisory Council is being reorganized to ensure the needs of the industry area being met. (This Council will meet at least once annually with Agent Horticulture Advisory Council
- Sixteen meetings were conducted for over 700 adults and youth. Topics covered included fall gardening, native plants, herbs, container gardening, landscaping and care of holiday plants.

4-H Junior Master Gardener Pilot Program for Mississippi

The Junior Master Gardener Program is a youth gardening curriculum developed by Texas A & M University for grades 3-5. It is modeled after the Master Gardener program. In addition to increasing the students' knowledge of horticultural and environmental sciences, the curriculum also focuses on "growing" youth through improving leadership skills and community involvement.

The Northeast District is leading the state in the participation and implementation of this program into the Mississippi 4-H curriculum. Agent enthusiasm and support of the program has resulted in over 80 adult volunteers and 1700 youth eager to participate. Administrators and agents in this district have been instrumental in developing guidelines and trainings for the statewide implementation of this program.

The pilot program is scheduled to begin in January 2001 and conclude in May 2001. This program has the potential to impact 1000's of youth and their families in this district. Results of studies by Texas indicate youth gardening programs have a positive influence on children's academic achievement, self-esteem, volunteerism and nutritional habits.

Northeast District Extension personnel are assisting in the formulating of evaluation surveys to determine the impact of the Mississippi pilot program. Pursuit of sponsorships (partners) for the 4-H Junior Master Program is key to the continued success of the program in this district. Knowing this, outside sponsorships from local agriculture-related businesses and industries have been sought. Based on initial response, it is anticipated support will be good. It is suggested that for the program to develop into a statewide 4-H curriculum this type of support should be pursued on a state level.

Magnolia Botanical Gardens

These research and demonstration gardens were established with the support of Mississippi State University, local civic organizations, businesses and industry. The purpose is to provide a living classroom for young and old, novice and professional. The gardens also serve as a demonstration and trial area of landscape ideas and appropriate plant material for our area.

After the completion of the first phase of the gardens four years ago, the impetus was lost for further development. To regain the early momentum and support of the gardens, a plan was implemented to better utilize and promote the educational and research resource that the gardens provides to the public and industry of North Mississippi. Every opportunity was taken to inform our clientele of this excellent, underused resource.

This increased exposure has resulted in several monetary donations to the further development of the gardens. Several 4-H, Master Gardener and other groups including schools have indicated a desire to tour the gardens or participate in horticultural learning activities in the gardens.

A 4-H Junior Master Gardener Day Camp is planned for the summer of 2001 in response to this increased interest. A District Master Gardener group will be trained beginning in January 2001 to assist in programming involving the gardens. They will also assist in the upkeep and further development of the gardens.

The Tupelo Parks and Recreation Department is investigating the possibility of partnering with the Research and Extension Center in promotion, utilization and further development of the gardens.

With the development of these opportunities and others the Magnolia Botanical Gardens will fulfill its purpose of providing a beautiful setting for research-based educational activities and information dissemination.

Herbin' League

Interest in herbs is at an all time high. Informal surveys conducted at the North Mississippi Garden Expo indicate that herbs are one of the top four areas of gardening in which people are most interested. To help address the desire of the public for herb information an herbal "workshop by mail" was developed in cooperation with the Family and Youth Center Coordinator, Linda Mitchell.

Newspaper and TV promotions were done for people to call and sign up for "The Herbin' League." Three separate workshops were planned. The first workshop was entitled "Herbal Gifts" and included instructions and diagrams

on how to construct 6 herbal gifts. The second workshop was entitled “Cookin’ with Herbs” and the third was entitled “Growin’ Herbs in the South.” Each workshop included information and at least one activity for youth. Approximately 150 youth and adults learned about herbs by signing up for the Herbin’ League.

County Extension Horticulture Activities

Horticulture programming and related activities are a large part of the overall program efforts of the county agents. Many agents spend as much as 70% of their time dealing with home horticulture. With the development of the “Mississippi Grow Green” initiative promoting and providing technical assistance to the green industry has become a main focus of some county programming.

With the second largest wholesale nursery located in Tippah county, the county agents there work closely with this client to increase efficiency of production, alleviate or control potential cultural problems and assist in training workers. It is estimated as a result of this assistance thousands of dollars and many labor hours are saved. Assistance provided by the Pontotoc agricultural agent to a greenhouse tomato grower resulted in a total yearly gain of \$6265 over the previous year’s income.

Some counties such as Tippah, Oktibbeha and Lowndes have more nurseries, garden centers and other green industries than other counties. Agents in these counties provide information and assistance to this clientele as well as provide programming and information to the largest client group needing assistance-the homeowner. Numerous programs and information are delivered with these clients as the targets.

An example of how the county Extension agent teamed with another government agency to better reach his clientele is the Wildflower Tour at the Jamie L. Whitten Plant Materials Center. The Yalobusha County Extension service assisted the Center in having a field day and tours of the wildflower test fields for the public. Due to this concerted effort 150 consumers learned more about horticulture and wildflowers.

Polls conducted nationally show that women between the age of 35 and 45 purchase more horticultural products or services than any other segment of the population. This trend is reflected in the number of female participants in special interest gardening clubs that are organized and managed by the Home Economist in the county. Calhoun and Prentiss are just two of the counties that have two predominantly female special interest gardening clubs that are involved in community service projects and other volunteer activities. Approximately 100 individuals participate in these two clubs.

The Master Gardener Program in the Northeast District plays an important role in assisting the agents in horticulture activities and programming. There are approximately 60 Master Gardeners in the district representing 2400 volunteer hours of service returned to the county Extension offices. Some of the projects and activities accomplished by the Monroe and Oktibbeha Master Gardeners are assisting agents in several workshops and demonstrations such as Conservation Day, Pizza Farm Field Day, working with local schools on outdoor learning projects and environmental education such as Butterfly Gardening. Several Master Gardeners have registered as 4-H volunteer leaders in the 4-H Junior Master Gardening Program.

4-H Horticulture is well represented in the Northeast District. The district is home to the Pizza Farm, an innovative garden planting that teaches the importance of horticulture and agriculture to today’s youth. The 4-H Horticulture Judging team that won first place in the state is from Lowndes County. These young people represented Mississippi well at the National Junior Horticulture Association Competition in Virginia, placing sixth in the competition. A young man from Oktibbeha county represented the Northeast District well by winning the State Horticulture Visual Presentation Contest and placing 2nd nationally in the 4-H Horticulture Illustrated Talk contest.

There are many other examples of how Extension is meeting the needs of our clientele through horticultural activities and programming. Suffice it to say that Extension personnel in the Northeast District will continue to strive to fulfill our mission of providing pertinent information and educational programming opportunities in the area of horticulture in a timely manner to consumers, youth and the Green Industry.

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NORTH MISSISSIPPI GARDEN EXPO
Crofton Sloan, MAFES Horticulturist
Lelia Scott Kelly, Extension Area Horticultural Agent

The annual Garden Expo is a collaborative effort between Extension and Research personnel of the North Mississippi Research and Extension Center to offer the public a wealth of research-based information on numerous gardening topics. The Expo also allows the public to view the trial and demonstration plantings and tour the Magnolia Botanical Gardens located at the R & E Center. Creative exhibits, demonstrations and seminars are presented to make the Expo an enjoyable and worthwhile experience.

University personnel were available for the 2-day event to answer any gardening or landscape-related questions. Area Master Gardeners, garden clubs, plant societies, and civic organizations assisted with the event.

The Expo has evolved over a four-year period into an annual event held in the fall. This year's event was attended by approximately 500 individuals, from across Mississippi, Alabama and Tennessee.

Surveys conducted at the Expo indicate this event could have a significant economic impact on the "Green Industry" of north Mississippi. Eight-five percent of the respondents indicated they would purchase more plants, seeds or other landscape supplies as a result of what they saw or heard at the event. Three times as many females as males attended the event indicating that possibly other topics could be offered that would be of interest to men.

The Garden Expo was very successful in providing an enjoyable and educational day for the participants, and 93% indicated on the survey that they very satisfied and would be back next year.

We anticipate this event will grow in popularity and attendance as we strive to continue to meet the needs of our clientele.

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FAMILY AND YOUTH CENTER

Linda Mitchell, Family & Youth Center Coordinator

Learning via Distance Education - Programs through our interactive video site at the Research and Extension Center in Verona have doubled this year. Audiences and presenters have taken advantage of the opportunity offered by distance education to save time, money, and energy while tapping into new resources and expanded technological capabilities.

A wide variety of topics were addressed with some like Farm Crisis, Veterinary Medicine, Youth Leadership, Financial Training for Teachers, Beef Cattle Shortcourse and Livestock Ethics targeting a specific group, while others offered information to the general public. Distance education proved beneficial within our organization as illustrated by the travel time and money Dr. Brown saved when he used this media to address the participants in the Northeast District Secretarial Training in September.

One of many Distance success stories is the E-commerce Conference in November. It was the first time MSU had undertaken a conference of this type. It was an all day live broadcast from the university to five remote sites, and participants pre-registered and payed online. Presenters for this conference were located at the MSU site and the Verona site.

Evaluations from Distance education programs were positive with statements expressing appreciation and requesting more programs via distance.

REAL Enterprises - Twenty-three adults and seven youth attended a two-day entrepreneur workshop offered by Rick Larson of REAL Enterprises. Among the participants were representatives from the Boys and Girls Clubs, MSU Extension Service, Public elementary schools, Middle schools, High schools and the Home Schooled Association. Evaluations by participants stated that this was a much-needed workshop, overall satisfaction was rated high and participants shared plans to disseminate the ideas and knowledge acquired.

Youth Entrepreneurship Corps - This group of youth from 10 surrounding counties met during July, August, and September, at the Research and Extension Center in Verona. Congressman Roger Wicker presented the program on September 11, 2000. He emphasized the importance of entrepreneurship and technology. After the meeting E-Corps youth took photos and interviewed Congressman Wicker for an upcoming issue of their publication "This N That."

The E-Corps group designed and created a web site for the Northeast Mississippi Fair in September 2000. They took photographs, conducted interviews and wrote articles for the web site. This project involved many hours of planning, implementation and evaluation on the part of the youth. They were in agreement that the benefits were definitely worth the time involved.

Entrepreneurship 101 - This training, offered on Monday nights in October and November, incorporated the expertise of the Small Business Development Center, Extension Food and Fiber, Small Business Development Specialist and Extension Business Analyst. Participants who were interested in starting or expanding their own business received in depth information on writing a business plan, record-keeping, marketing and available resources.

Technology as a Tool - An attack was mounted on the digital divide with a series of hands-on workshops teaching PhotoShop, technology basics, digital photography and web design. Participants ranged in age from teenagers to senior citizens.

Financial Management - The Research and Extension Center in Verona hosted four Financial Management Seminars. Speakers stressed the importance of establishing a financial plan and increasing savings and investments.

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ENTOMOLOGY

Michael R. Williams, District Entomologist

Crop/arthropod situation for NE Mississippi: There were some very unique arthropod situations in NE Mississippi in 2000. Spider mites were reported in heavy numbers in some cotton fields for the first time in many years. Grasshoppers were in outbreak proportions in a number of crops, including hay and pasture. Fall armyworms were also serious pests of hay and pastures during 2000. Stink bugs and chinch bugs were reported in a number of crops, including cotton. Seldom before pests, like Negro bugs, false chinch bugs, and saltmarsh caterpillars were reported in crops, as well. Thrips were very heavy in the early season in most of the row crops. Whiteflies and aphids also continue to be pests of numerous crops in our area. Home gardens, especially tomatoes, suffered from western flower thrips, which transmitted spotted wilt virus disease causing death of plants.

Cotton: Cotton is one of the mainstays in row crop agriculture in Northeast Mississippi and arthropod management is a major concern for cotton producers. As boll weevil eradication progresses and becomes more successful, cotton acres are gradually increasing in the area. The twenty-eight counties currently grow approximately 300,000 acres of cotton. Arthropod losses in 2000 were extremely light. All arthropods reduced yields by 4.69%. The bollworm/budworm complex caused the most problems reducing yields of NE Mississippi cotton by 2.8%. Northeast Mississippi farmers combat these pests by 1) planting *Bt* transgenic cotton and by 2) spraying insecticides for their control. Only about 1/3 of the acres were treated with any insecticide in 2000 and about 60% of the acres were planted to the *Bt* transgenic varieties. Foliar applications of insecticide were at an all time low with an overall cost of \$13.02 per acre in Northeast Mississippi. The total cost of arthropod management, including - at planting insecticides, *Bt* use fees, eradication costs, scouting, and foliar insecticides was \$74.98 per acre. Yields were severely reduced by the more than 10-week drought, which began after July 10 and proceeded through harvest. A complete listing of all Cotton Insect Losses is available at <http://www.msstate.edu/Entomology/Cotton.html>.

Soybeans: Insect activity in soybeans centered on outbreaks of grasshoppers during the early summer. These pests attacked young plants and completely destroyed stands in a number of counties in NE Mississippi. Insecticides were not as effective as desired and often, repeated applications were required to bring the outbreaks under control. In the late season there were also reports of damage from whitefringed beetles in soybeans.

Corn: Chinch bugs and heavy populations of stink bugs attacked corn early in the season. In some areas of the NE District stand was lost because of the outbreaks of these pests. Grasshoppers were also a problem in corn and the other grass crops in June and July.

Sweetpotatoes: Losses to insects in sweetpotatoes are almost always recognized after it's too late to do anything. Pests of this crop include – the grub complex (white grubs, whitefringed beetles, cucumber beetles, and others), the black flea beetle, and wireworms below ground, and the Lepidoptera – mostly armyworm complex above ground. In 2000 the caterpillars went below ground in large numbers to feed on developing roots. Because of the drought and the natural tendency of soil to crack around the developing roots, Lepidoptera larvae were able to gain entry and do tremendous damage by feeding directly on the developing roots. In some cases the cull rates for insect damage reached 40 to 50 %. Late season damage from wireworms and whitefringed beetles was heavy in a number of fields.

Other entomological activities in NE Mississippi: Interest in butterflies and butterfly gardens continues to develop in NE Mississippi. Numerous Garden Clubs and other similar organizations are developing butterfly gardens throughout the area. Schools are also getting into the act by building outside science and environmental study laboratories, which include butterfly plants. Homeowner gardens and Master Gardener Projects also received attention during 2000.

4-H Activities: There were 6 Junior Linnaean teams and 4 Senior Linnaean teams from the 28 county area in 4-H Linnaean Game competition. Pontotoc and Attala Junior Linnaean teams were winners in their respective areas and Attala's Senior Team was second place in the Senior Linnaean Games at 4-H Club Congress. There were 16 Insect collections from the 28 county area displayed in various fairs and competitions. More than 50 young people from the area participated in 4-H entomological activities in 2000. Our overall senior Winner in 4-H Entomology for 2000 was Andrea Patterson from Itawamba County. Andrea was first place in all individual contest categories at the State 4-H Club Congress. A number of NE Mississippi Extension Agents were extremely helpful with 4-H

entomological activities in 2000. These individuals include – Connie Robbins and Tim Needham, Tippah county; Connie Patterson, Itawamba; Stan Wise, Union; Christine Fielder, Yalobusha; Karen Benson, Attala.

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LIFE SKILLS THROUGH 4-H PROJECTS - PIZZA FARM

Sherry Smith, 4-H Youth Agent

Program Description: Today’s children have fewer opportunities to see animals and crops growing on farms. Therefore they are less aware of the sources of many products. The lack of knowledge about agriculture is on the increase and, therefore, the general public does not realize the importance. The awareness of the value of agriculture and the respect for the farmers are key issues to address. One proven and accepted method for telling an important story and changing attitudes over time is to target the youth audience.

The Program: The Mississippi State Extension Service organized Pizza Farm Field Days to educate children on the importance of farmers and the role of agriculture to produce kids’ all-time favorite food – pizza. This has become an interesting and appetizing way to present the story of agriculture to today’s younger generation, yet keep it on a level they understand and can appreciate.

The field days involve rotating youth through nine hands-on educational stations. Each station represents a commodity that goes into making a pizza. Things like dairy, beef, pork, vegetables, forestry, wheat, soybeans, and herbs are discussed. The favorite stop for youth is the actual Pizza Farm itself. Laid out in the shape of a pizza, the farm is 80 feet across, and divided into eight sections that represent the various commodities.

Impact: Approximately 4000 third-grade students from area city and county schools have participated in Pizza Farm Field Days. A random sample of students has been tested through the pre/post test method in which a sizeable gain in knowledge was reflected. Teachers have also been surveyed on the effectiveness of the event. Comments from teachers include:

“The students were very enthusiastic and interested in all the activities. The teachers and students hope this will be an annual event.”

“After we returned to school, we used many of the principles the children had learned in additional lesson plans, including math.”

“This was our first year to attend, please make sure we get an invitation for next year, we want to make this an annual event.”

Key to Success: The willingness of commodity groups and other agencies to form partnerships with MSU-ES is for the good of our youth. The enthusiasm and interest that teachers exhibited made it a positive experience for the students. The ability of teachers to incorporate the concepts learned into other areas of teaching creates a holistic approach to learning.

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WILEY L. BEAN SWINE DEMONSTRATION UNIT
Mark Crenshaw, Associate Specialist, Animal & Dairy Science

The Wiley L. Bean Swine Demonstration Unit was established in 1985 as a joint program between the MSU Extension Service and Tennessee Valley Authority Agriculture Institute. The program was established to serve as an educational resource to area swine producers. Throughout the first ten years, educational programs focused on swine facilities, equipment, technologies and management procedures. Changes in the structure of the swine industry caused concern among current producers as to the future of market access. In 1995, the program was re-directed to provide Mississippi Producers with the foundation from which a producer network could be developed.

In general, a genetic improvement program was developed to provide area producers with a source of replacement gilts. Gilts purchased from the Wiley L. Bean Swine Demonstration Unit were made available to producers through video sales. Maternal line Yorkshire boars were maintained at the swine unit for the purpose of providing semen for mating the gilts purchased in this program. Following the program design, producers would keep replacement gilts from this breeding program and mate to a terminal line boar. Pigs produced from this mating would be shipped to market. About 25% of the total pigs marketed (476 pigs) in 2000 were sold as replacement gilts (117 gilts). About 85% of these replacement gilts were sold to local swine producers with the remaining gilts provided to the MSU Swine Research Unit. Producers participating in the genetic program would have market pigs that are genetically similar so the smaller production units could "pool" the pigs and market them in-groups large enough to take advantage of carcass merit buying programs. Formation of marketing groups would then progress into networks of purchasing feed, equipment, and supplies.

Since 1997, the swine industry has experienced below breakeven market prices with record low prices in 1998 continuing into 1999. This has slowed progress of program participation and development at the Wiley L. Bean Swine Demonstration Unit. To assist the MSU Research Unit, the genetic program was slightly modified to provide replacement gilts for the research herd in 1999. In 2000, approximately, 14% of the replacement gilts sold were placed in the breeding herd at the MSU Swine Research Unit and other pigs were provided to support a research project.

Environmental issues continue to be a major concern of swine producers. Changes in environmental regulations have placed pressure on previously established swine operations to comply with new standards. Many swine operations utilize some type of a lagoon system for waste disposal. Normal management of lagoons require agitation and pumping of the solids once buildup occurs. While there are many products on the market today that claim to eliminate solid buildup, the effectiveness of these products is still undetermined. The Wiley L. Bean Swine Demonstration Unit selected a lagoon additive, which claims to reduce solid buildup, and began using the product according to company directions. Prestage Farms is assisting with this demonstration by providing equipment designed to measure sludge buildup. Results of this demonstration will be used to verify the effectiveness of breaking down the sludge buildup in an aging lagoon and provide some indication as to the effectiveness of this product to prevent sludge buildup in a new lagoon. Another project planned for 2001 will include the composting of mortality for the family farm swine operation.

Other program activities conducted at the Wiley L. Bean Swine Demonstration Unit in 2000 include: School tours for K - 3 students (214 students), 4-H judging clinics and contests, group and individual tours (76 Adults), and research using swine effluent (Dr. Cushman's Research Project).

The market outlook for 2001 is projected to be near or slightly above breakeven, so interest in swine production is expected to increase. Educational efforts at the Wiley L. Bean Swine Demonstration Unit will continue to provide assistance to area swine producers and the swine industry. By providing individuals with accurate information regarding swine production and the swine industry, informed decisions can be made by these individuals regarding the development and management of a swine enterprise.

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AGRONOMIC STUDIES – GRAIN CROPS: CORN

PERFORMANCE OF BIO-ENGINEERED CORN HYBRIDS

Erick J. Larson, Normie W. Buehring, and Roscoe L. Ivy

ABSTRACT: Bio-engineered corn hybrids which should improve crop productivity are rapidly being introduced for commercial use in the United States. These bio-engineered hybrids contain various types of herbicide and/or insect resistance. However, producer reports and limited research results indicate performance deficiencies can occur when comparing bio-engineered crops to conventional hybrids. Our objective was to compare bio-engineered hybrid performance to their closely related conventional isolines in identical cropping systems grown in various Mississippi environments. Eight hybrids containing bio-engineered hybrid traits including Liberty Link, Roundup Ready, CLEARFIELD, YieldGard and Starlink and their conventional isolines were evaluated in 2000. Grain yield production of bio-engineered corn hybrids compared to their respective conventional isolines differed depending upon hybrid. One bio-engineered hybrid suffered substantial grain yield lag, while another produced higher yield, and others produced yields similar to their respective conventional isolines. This grain yield variability indicates bio-engineering may affect hybrid performance compared to their conventional isolines. Thus, producers should not assume bio-engineered corn hybrids will always perform similarly or better than their closely-related conventional isolines.

PIONEER CORN SILAGE VARIETY TEST

Donald E. Pogue, George Stabler, and John Love

ABSTRACT: Seven Pioneer standard corn varieties and 3 Pioneer experimental varieties were planted on 3/24/00 in 8-row plots to test for silage characteristics. All variety plots were treated similar with respect to weed control, fertilization, and plant population. Rainfall during the growing period was 12.79 inches. All plots averaged a yield of 11.7 t/ac of 30% DM silage and ranged from a low of 6.6 t/ac (30% DM) to a high of 15 t/ac (30% DM). Plot average for crude protein (CP) was 8.1% and ranged from a low of 7.4% to a high of 8.5%. Plot average for net energy for lactation (NEL) was .67 with a range of .63 to .73. Acid detergent fiber (ADF) ranged from 22.7% to 28.1% with a plot average of 25.3%. Digestible fiber ranged from 44.8% to 50.1% with a plot average of 48.1%. Other analysis included % sugar, % starch, % RAE, Dig. WP, commeal yield, adj. beef yield, and adj. milk yield.

CORN RESPONSE TO TWIN AND NARROW ROWS WITH SELECTED SEEDING RATES

N. W. Buehring, G. R. Nice, and R. R. Dobbs

ABSTRACT: Two studies (twin and narrow row) were conducted at Verona, Mississippi, on a Catalpa silty clay soil evaluating seeding rates in selected row spacings and seeding rate combinations. These were compared to the standard 30 or 38-inch rows at 28,000 seed/ac. In the twin row (2, 9.5-inch rows on 38-inch row center) study seeding rates ranged from 28,000 to 56,000. There was no difference in yield between the twin row seeding rate treatments and the 38-inch row. The twin row 42,000 and 56,000 seed/ac rate had more small ears (≤ 4 inch) than the 38-inch row. In the narrow row (15 and 19-inch) study, the 15-inch 33,000 seed/ac treatment had higher yield than the 38-inch row spacing. There was no difference in yield between all other treatments. The 19-inch 33,000 seed/ac had more small ears (< 4 -inch) than all other treatments.

CORN RESPONSE TO NITROGEN, TIME, AND RATE OF APPLICATION

N. W. Buehring, L. Oldham, G. R. Nice, and R. R. Dobbs

ABSTRACT: A 3-year (1998-00) corn N rate and time of N application study on a Leeper silty clay soil indicated that all N applied sidedress to 6 to 8 leaf corn had yield equal to 40 lb N/ac applied at planting with the rest of the N applied sidedress. Sidedress applied N was more efficient than all N applied at planting at the high yield level 2 (1998-99) of 3 years. In 2000, the dry, early growing season resulted in the 80 and 200 lb n/ac, all applied at planting, having a higher yield than the sidedress applications. However, all sidedress N applications were as

efficient as the split N application. The 200 lb N/ac all applied sidedress (6 inches from row and 2 inches deep) or as a split (40 lb N/ac at planting + 160 lb N/ac sidedress) maximized yield of > 122 bu/ac 2 of 3 years.

EFFECTS OF NITROGEN RATES, TIMING, AND APPLICATION METHOD ON NO-TILL AND CONVENTIONAL CORN

William B. Burdine, Jr., Mark W. Shankle, and Paul G. Thompson

ABSTRACT: Corn grain yield was evaluated across six nitrogen (N) rates (0, 50, 100, 150, 200, 250); two timing of applications (at planting vs 50 lb N at planting + sidedress); and two application methods (broadcast ammonium nitrate vs dribbled urea-ammonium nitrate solution). This experiment was conducted under no-till and conventional till systems. Nitrogen rate failed to provide a yield difference due to limited rainfall, which prevented adequate nutrient uptake. Timing of application also failed to show a yield response. The application method did affect yields on conventional corn. Liquid UAN solution provided a yield increase of 11 bu/ac over granular ammonium nitrate. Although not statistically different, UAN solution tended to increase yields in no-till corn as well. The lack of rainfall at the study site greatly reduced the ability of corn plants to reach their potential yields.

CORN FOR FEED GRAIN IN THE BLACKLAND PRAIRIE

R. L. Ivy, J. L. Howell, E. B. Triplett, E. J. Larson, and J. R. Johnson

ABSTRACT: The demand for corn as a livestock feed has caused an increase in corn acreage for the Blackland Prairie. This study was initiated to study effects of tillage and/or crop rotation on corn grain yield. Two soil types (Houston Clay and Vaiden Silty Clay) were selected for this study. Environmental conditions were not favorable for corn production in 2000. Corn grain yields were low due to insufficient moisture. As in previous years, the corn-soybean rotation resulted in higher yields than the monoculture systems. Yield differed by soil type and treatment for 2000. Highest corn grain yield was for fall para-till-bed on both soil types. Other treatments varied by soil types.

EFFECT OF FIELD DRY DOWN AND DELAYED HARVEST ON CORN YIELD AND QUALITY

Eugene Columbus and Herb Willcutt

ABSTRACT: Corn harvest was initiated by hand harvesting sub plots of the test fields to establish a theoretical yield and with a combine at the three locations. Grain moisture initially ranged from 19.3% at Stoneville to 34.2% at Verona with the grain harvested on the later harvest dates having dried to as low as 12.6%. Each successive week for four weeks, samples were harvested with a combine and determinations made for combine harvested yield, grain moisture, aflatoxin levels, grade, damaged kernels and foreign matter contents. Sample moistures indicated that field dry down occurred at an average rate of 0.60% per day through out the season; however, Verona experienced a drying at rate of over 15% in 11 days while Raymond had a drying rate of over 11% in 7 days between the first two harvest dates. Combine efficiency varied from a low of 87.8% to a high of over 100%. Machine condition and adjustments were believed to greatly influence harvester efficiency as well as broken kernels and foreign matter. Aflatoxin levels were found in samples at two locations and this was believed to be a result of drought stress and worm infestation. Actual yields ranged from 74.4 bu/ac for dryland production at Raymond to 174.4 bu/ac for irrigated production at Stoneville. Grades ranged from ANo. 1 Yellow Corn@ to ANo. 6 Yellow Corn@ for the three locations with damaged kernels and foreign matter ranged from 0.96% to 4.76%.

EVALUATION OF IN-FURROW AND FOLIAR INSECTICIDES FOR CONTROL OF SEEDLING CORN PESTS.

Jack T. Reed and Normie Buehring

ABSTRACT: This is the third year of a study to evaluate the efficacy of and need for use of insecticide at planting. Three insecticide treatments, one to be applied foliarly as needed and two applied in-furrow at planting, were evaluated for efficacy against early season corn pests at the North Mississippi Research and Extension Center, Verona, MS during the summer of 2000. Insect numbers were insufficient to initiate spray application of the foliar

treatment. Plant stand and height, plants damaged by cutworm, plants with dead-heart, and numbers of chinch bugs, seed-corn maggots, and wire worms did not differ significantly between treatments throughout the test. The results indicate that there were insufficient insects present in the trial to affect the crop, and that there was no significant influence of the in-furrow insecticides on the crop in the absence of high insect pest numbers.

DEVELOP EROSION CONTROL TILLAGE SYSTEMS FOR COTTON, CORN, SOYBEAN, AND RYEGRASS

K.C. McGregor, R.F. Cullum, J.S. Schreiber,
S.M. Dabney, G.V. Wilson, and J.R. Johnson

ABSTRACT: A literature survey summarized the beneficial effects of crop residues on soil erosion. Recent and historical (40-years) crop yield, runoff, and soil loss erosion data from crop production plots, erosion plots, and small watersheds illustrated the erosion control effectiveness of various conservation tillage practices. The erosion control effectiveness of no-till (NT) crops and grass buffer strips on idle land being returned to row-crop production provided useful information related to the potential return to row-crop production of land previously in the conservation reserve program (CRP). Other continuing erosion control studies included the evaluation of soil and water conservation management of poultry waste-amended ryegrass systems, long-term effects of NT and conventional-till (CT) practices on crop yields for a 16-year period (1984-1999), and stiff grass hedges with reduced-till and CT ultra narrow-row cotton. Ryegrass tillage treatments included a short fallow period (planted immediately after tillage), a long fallow period (planted one month after tillage), and no-till. Two-year average soil losses from each of these treatments averaged less than 1 t/ac. A recent topographic survey revealed dramatic differences in elevation between no-till and conventional-till plots after 17 years. The net loss for a 100 ft long reach for conventional-till as compared to no-till averaged 8 inches.

AGRONOMIC STUDIES – GRAIN CROPS: CORN-SOYBEAN ROTATION-TILLAGE

COTTON RESPONSE TO TILLAGE IN A CORN ROTATION SYSTEM

N. W. Buehring, W. R. McCarty, G. R. Nice, and R. R. Dobbs

ABSTRACT: Seven tillage methods in continuous cotton and cotton following ridge-tillage corn in a rotation were evaluated on a Marietta silt loam soil in the 2000 growing season. Rainfall during the growing season was highly variable with below normal rainfall in March, May, July, August, and September. Above normal rainfall of 233% and 133% occurred in April and June, respectively. However, timely rainfall in June, July, and early September resulted in cotton lint yield mean of 1163 lb/ac. Except for the ridge-tillage treatment, cotton following ridge-tillage corn had increased yield from 84 to 239 lb lint/ac when compared to continuous cotton. In continuous cotton, except for ridge-tillage, all reduced tillage systems had higher lint yield than conventional tillage. In the rotation, all reduced tillage systems and conventional tillage had higher yield than ridge-tillage yield of 1058 lb lint/ac. Corn residue increased ground residue cover in all tillage systems. The reduced tillage systems also had increased ground residue cover.

AGRONOMIC STUDIES – GRAIN CROPS: SOYBEANS

ROUNDUP AND CONVENTIONAL SOYBEAN VARIETY TRIALS

N. W. Buehring, G. R. Nice, R. R. Dobbs, and Bernie White

ABSTRACT: One hundred sixty-eight soybean varieties were evaluated on a Leeper silty clay soil in 2000. Ninety-six were Roundup Ready and 72 were conventional varieties. The Roundup Ready and conventional were each evaluated in separate studies according to the following maturity group: early maturity group IV, late maturity group IV, early maturity group V, and late maturity group V. A conventional maturity group VI variety study was also

conducted. The environmental growing conditions were very unfavorable in August (only 0.33 inches of rainfall) and the first week of September. Timely rainfall in June and July resulted in above average yields. The highest yielding varieties in conventional and Roundup Ready were higher than 46 bu/ac except for the late maturity V Roundup Ready study and the conventional maturity group VI variety study. The lowest yielding variety in each study ranged from 18 to 23 bu. When compared to the lowest yielding varieties in each study, selecting the most productive variety has the potential to the double the yield.

2000 SOYBEAN VARIETY TRIAL FOR THE BLACKLAND PRAIRIE

R. L. Ivy, B. W. White, and J. L. Howell

ABSTRACT: Soybean varieties have proliferated in recent years. This soybean trial was conducted on a Houston Clay soil. This trial shows the performance of variety to disease, nematode, herbicide reaction, and yield performance to the clay soil. The data from this trial provides producers with a better knowledge of performance when selecting soybean varieties. Early conditions were favorable for emergence and growth. Extreme hot and dry summer conditions resulted in extremely poor conditions for growth and grain production. Roundup® ready maturity groups IV and V were evaluated for grain yield. Yields for early maturity Group IV ranged from a low of 10.1 to a high of 17.4 bu/ac. Plant height ranged from 24 to 31 inches in height. Yield for late maturity Group IV ranged from a low of 11.4 to a high of 21.3 bu/ac. Yield for early maturity Group V ranged from a low of 5.9 to a high of 18.6 bu/ac. Yield for late maturity Group V ranged from a low of 6.7 to a high of 20.8 bu/ac.

SELECTED SOYBEAN VARIETIES RESPONSE TO TILLAGE SYSTEMS

N. W. Buehring, R. R. Dobbs, and G. R. Nice

ABSTRACT: Previous research indicated soybean varieties may differ in their yield response to tillage. Therefore, a study was conducted on a Catalpa silty clay loam soil evaluating yield response to tillage (no-tillage and conventional tillage) of 16 highly productive varieties of which 2 were maturity group (MG) IV and 14 were MG V. The conventional tillage system was field cultivated twice in February and March followed by a doall in late April. The study mean yield was 32 bu/ac and there was no yield difference between no tillage and conventional tillage. Bolivar, A5959, DP 3478, and DP 4748-D had no yield difference. However, MG IV varieties DP 3478 and DP 4748-S produced higher yield than all MG V varieties except A5959 and Bolivar. Except for P 95B53, NKS 59-V6RR, A5959, and Bolivar, there was no difference among other MG V varieties.

MATURITY GROUP V SOYBEAN RESPONSE TO EARLY PLANTING

N. W. Buehring, G. R. Nice, and R. R. Dobbs

ABSTRACT: A study was conducted during the 2000 growing season evaluating productive maturity group V varieties response to early planting on a Leeper silty clay soil. Twenty maturity group (MG) V and 4 MG IV varieties in 30-inch rows were planted 4/27/00, 5/17/00, and 6/08/00. At maturity, April and May planting heights were similar and both dates were taller than June planting. Soybean varieties yields were similar but lower from April to June planting across all 3 planting dates and there was no planting date by variety interaction. Maturity group IV varieties planted in April had a yield range from 34 to 51 bu/ac and MG V ranged from 33 to 50 bu/ac. Averaged over varieties, the April planted yield was 43 bu/ac, 9.5 bu/ac more than May and 24.5 bu/ac more than June planting. These results were similar to 1999, which also indicated higher yield for April compared to June planting. However, averaged over planting dates, there were yield differences among varieties. DK 5995, Bolivar, Asgrow 5959, DP 5354, Pioneer 95B53, S59-V6RR, and Pioneer 9594 yields were not different. Yields ranged from 33.7 to 39.3 bu/ac. These varieties had higher yield than D92-3267, RVS-77, DP-3588, Hornbeck 5770, TV 5495 and DP 5915RR. Bloom dates for 4/27/00 planting was about 6/18/00 and 6/25/00 for MG IV and MG V varieties, respectively. The 5/17/00 planting bloom date was about 6/26/00 and 7/08/00 to 7/18/00 for MG IV and V varieties, respectively. The 6/17/00 planting bloom dates were about 7/12/00 and 7/25/00 to 8/02/00 for MG IV and V varieties, respectively. Maturity ranged from 16 to 35 days earlier for 4/27/00 than 5/17/00 planting date.

SOYBEAN RESPONSE TO EARLY PLANTING AND SEED TREATMENT

N. W. Buehring, R. R. Dobbs, and G. R. Nice

ABSTRACT: A field study was conducted on a Leeper silty clay loam soil at Verona, Mississippi, to determine maturity group (MG) IV DP 4750RR variety response to early planting early and seed treatment. The results indicated that seed treatment had no effect on stand establishment and yield across all planting dates. The mild temperatures in late March, April, and May allowed stand establishment without seedling diseases. Both, the 3/31/00 and 4/27/00, planting dates were not different in yield and both had higher yield than 5/31/00 and 6/14/00 planting. The March planting had a height at maturity of 23 inches which was lower than the April and May planting maturity height of 39 and 32 inches, respectively. These preliminary results indicated soybean height may be shortened when planting in late March but will have no effect on yield. Additional years research are needed to confirm these results.

SOYBEAN YIELD AND WEED CONTROL COST COMPARISON FOR CONVENTIONAL AND ROUNDUP TOLERANT VARIETIES

N. W. Buehring, R. R. Dobbs, and G. R. Nice

ABSTRACT: A study was conducted evaluating highly productive Roundup Ready soybean varieties and conventional varieties yield response to Roundup weed and conventional postemergence weed management systems, respectively. Pitted morningglory (*Ipomoea lacunosa*) and johnsongrass (*Sorghum halepense*) were major weeds present with light infestations and were effectively controlled with both systems. One application of Roundup at 1 lb ai/ac (3 pt/ac) and one application of Typhoon at 0.56 lb ai/ac (3 pt/ac) + 2 pt/ac crop oil was required for optimum weed control in Roundup and conventional weed management systems, respectively. These results indicate that weed management cost were similar for either system. Roundup weed management (including technology fee) was \$19.50/ac compared to \$20.00/ac for conventional weed management. Roundup Ready and conventional variety yields were similar and ranged from 35 to 44 bu/ac. The Roundup Ready varieties' yield ranged from 34.7 to 42.5 bu/ac. The conventional varieties' yield ranged from 36.2 to 44.4 bu/ac. These results indicate that with cost effective weed control in either weed management system, variety selection becomes most critical.

SOYBEAN VARIETY RESPONSE TO WIDE-BED STALE SEEDBED TILLAGE SYSTEMS

N. W. Buehring, R. R. Dobbs, and G. R. Nice

ABSTRACT: Wide stale seedbed systems for drainage have potential for use with drill soybeans on bottomland soils. The beds provides surface drainage which may be essential for good stand establishment and early growth on soils with poor surface and internal drainage, especially during wet periods of the soybean emergence period. A long-term wide-bed tillage study on a Leeper silty clay soil with 0.25% slope was continued in 2000. The environmental growing conditions ranged from good early season to poor in late May and late August and early September. Soybeans planted 5/01/00 resulted in a study mean yield of 34.7 bu/ac. TV 4975 (MG IV) variety produced higher yield than DP 3588 (MG IV) in all treatments except the fall-chisel-harrow where there was no difference. The fall chisel harrow and fall chisel beds had higher yield than the no-tillage with TV 4975 and DP 3588. However, the raised beds showed no yield advantage over the fall chisel harrow system with both varieties.

SOYBEAN RESPONSE TO SELECTED ROW SPACING AND SEEDING RATES WITH UNIFORM AND NON-UNIFORM SEED SPACING

N. W. Buehring, G. R. Nice, and R. R. Dobbs.

ABSTRACT: A study was conducted during the 2000 growing season evaluating the influence soybean row spacing and seed rates have on soybean yield and sicklepod control using 2 or 3 applications of Roundup Ultra (glyphosate). The one-year results indicated a Roundup by row spacing-seed rate interaction. Three Roundup applications increased sicklepod control and yield generally at the lower seeding rate and wide rows with no difference at higher seed rates. The 2 applications with higher seeding rates than 105,000 seed/ac had yield equal to 3 applications of Roundup in all 19-inch or less row spacing. The 28.5-inch row spacing at 140,000 seed/ac with 3

applications of Roundup had a higher yield than 2 applications but lower than 9.5-inch at the same seeding rate. The 9.5-inch row at 105,000 seed/ac had a yield equaled to 7.5 and 19-inch row at 140,000 and 210,000 seed/ac.

The data indicated that there was no difference between 7.5 and 15-inch rows at 140,000 or 210,00 seed/ac using the conventional seeding method. The 9.5-inch row planted with vacuum planter (uniform seed spacing) at 105,000 seed rate had a yield equal to 7.5 and 15-inch rows at 140,000 seed/ac with 2 or 3 Roundup applications. However, as seeding rate increased, the vacuum seeding method showed no yield advantage over the 7.5-inch row conventional method. The 9.5-inch row 105,000 seed/ac with 3 applications had higher (95% Vs 85%) sicklepod control than with 2 applications. The 19-inch low seed rate (105,000/ac) and the standard 28.5-inch row had less sicklepod control and yield than the higher seeding rates in 19-inch rows. The preliminary data indicates that vacuum planting in narrow rows may allow lower seeding rates and maintain yield.

ROUNDUP READY SOYBEAN WEED CONTROL AS INFLUENCED BY A PRE HERBICIDE IN COMBINATION WITH ROUNDUP

N W. Buehring, G R.W. Nice, and R. R. Dobbs

ABSTRACT: Soybean growers are interested in determining whether the use of a PRE herbicide in a Roundup weed control program is necessary. Therefore, a study was conducted at the Northeast Branch Experiment Station to determine the effects of a single or sequential Roundup (glyphosate) applications in combination with or without a PRE application of Squadron (imazquin + pendimethalin) at 0.87 lb ai/ac on weed control in low and high infestations of pitted (*Ipomea lacunosa*) or entireleaf morningglory (*Ipomea herderacea*) and sicklepod (*Sena obtusifolia*). Roundup applications at 1.0 lb ai/ac were made 14, 21, and 28 days after planting (DAP) or at 1.5 lb ai/ac 35 DAP. In the sequential applications, Roundup at 1.0 lb ai/ac was applied 14, 21, 28 DAP or 1.5 lb ai/ac 35 DAP followed by (Fb) 0.5 lb ai/ac 14 days after the initial application. Weed infestation level showed no difference in morningglory or sicklepod control and yield. A PRE herbicide increased soybean yield in all single and sequential Roundup applications. The 28 DAP Roundup sequential with the PRE had higher yield (40.6 bu/ac) than all other treatment combinations except the 14 DAP Roundup sequential with a PRE. The PRE application increased late season morningglory control but only in both 21 DAP sequential and single Roundup applications. The PRE with Roundup sequential applications had no effect on sicklepod control. However, except the 28 DAP, PRE increased sicklepod and morningglory control in all single Roundup applications. Weed infestation level had no effect on foreign matter. Except for the 28 DAP, the PRE reduced foreign matter in all Roundup single applications with no effect on Roundup sequential application.

SOYBEAN RESPONSE TO FOLIAR DIMILIN, BORON, AND N APPLICATIONS

N. W. Buehring, G. R. Nice, and R. R. Dobbs.

ABSTRACT: A study was conducted during the 2000 growing season at Verona, Mississippi, to evaluate the influence a foliar application of Dimilin (diflubenzuron) alone or in combination with boron or liquid slow release nitrogen, applied as a foliar spray, had on soybean insect pests control, soybean maturity and yield. All applications were made to soybean in R4 stage of growth (one $\frac{3}{4}$ inch pod in the upper 4 nodes of the plant). Insect infestations were light. All foliar treatments or treatment combinations had no effect on delaying maturity, (defoliation), lodging, or yield.

FORAGE SOYBEANS FOR THE BLACKLAND PRAIRIE

J. L. Howell and R. L. Ivy

ABSTRACT: Five varieties of soybeans were planted at the Prairie Research Unit, Prairie, MS on May 11, 2000. The soybeans were planted in a prepared seedbed on Houston clay (very fine, montmorillonitic, thermic, Typic Chromudelts). These varieties, Donegal, Hornbeck (HBK 5990), Laredo, Tyrone and Wilson6, were planted at three different rates, 40, 50, and 60 lb per acre, on 8 inch spacing. Fertilization was applied per soil test recommendations. The 2000 growing season was extremely hot and drier than normal. All varieties were harvested at the R3 stage of production. At harvest, one plant from each variety was selected and a leaf stem ratio was determined. Additionally, a representative sample was selected for forage quality and dry matter analysis. The

following show the varieties yielding the highest difference. Wilson at the 50 lb rate produced the highest percent protein at 15.9. Tyrone at the 60 lb rate produced the highest NDF, 45.9%, and ADF, 31.9%. Wilson and Donegal at the 40 lb rate, Donegal at the 50 lb rate and Laredo at the 60 lb rate were not significantly different when analyzed for IVDMD. Wilson at the 40 lb rate measured 65.5%. When measured on a dry matter basis, Donegal yielded the highest at 6005 pounds per acre.

DEVELOP EROSION CONTROL TILLAGE SYSTEMS FOR COTTON, CORN, SOYBEAN, AND RYEGRASS

K.C. McGregor, R.F. Cullum, J.S. Schreiber,
S.M. Dabney, G.V. Wilson, and J.R. Johnson

ABSTRACT: A literature survey summarized the beneficial effects of crop residues on soil erosion. Recent and historical (40-years) crop yield, runoff, and soil loss erosion data from crop production plots, erosion plots, and small watersheds illustrated the erosion control effectiveness of various conservation tillage practices. The erosion control effectiveness of no-till (NT) crops and grass buffer strips on idle land being returned to row-crop production provided useful information related to the potential return to row-crop production of land previously in the conservation reserve program (CRP). Other continuing erosion control studies included the evaluation of soil and water conservation management of poultry waste-amended ryegrass systems, long-term effects of NT and conventional-till (CT) practices on crop yields for a 16-year period (1984-1999), and stiff grass hedges with reduced-till and CT ultra narrow-row cotton. Ryegrass tillage treatments included a short fallow period (planted immediately after tillage), a long fallow period (planted one month after tillage), and no-till. Two-year average soil losses from each of these treatments averaged less than 1 t/ac. A recent topographic survey revealed dramatic differences in elevation between no-till and conventional-till plots after 17 years. The net loss for a 100 ft long reach for conventional-till as compared to no-till averaged 8 inches.

AGRONOMIC STUDIES – GRAIN CROPS: CANOLA, WHEAT, AND OATS

NATIONAL CANOLA RESEARCH PROGRAM FOR THE MID-SOUTH REGION

R. L. Ivy, J. L. Howell, J. R. Johnson, and J. R. Saunders

ABSTRACT: Canola is being tested as an alternative grain crop for Mississippi. This study is an on going evaluation of canola varieties for grain production under Mississippi environmental conditions. The window for establishment in Mississippi is narrow. This is the first or second week of October, and this is a period that is usually dry. For winter survival, plants need approximately six leaves. Site selection is also important, since the plants need sites with good sub-surface drainage. The winter of 2000 was warmer and dryer than average. Canola grain yields were good at both locations. Yields ranged from a low of 855 lb/ac to a high of 2352 lb/ac.

2000 WHEAT AND OAT VARIETY TRIALS FOR THE BLACKLAND PRAIRIE

Roscoe Ivy, Bernie White, Jimmy Howell

ABSTRACT: This study was initiated to give producers of the Blackland Prairie Region of Mississippi a better knowledge of selection of wheat and oat varieties for grain yields. The experimental design was a randomized complete block with four replications. Varieties are evaluated for yield, date headed, plant height, and lodging. 48 varieties of wheat and nine varieties of oats were planted on October 27, 1999. Wheat yields ranged from a high of 93.3 bu/ac for Agri Pro Mallard to a low of 55.1 bu/ac for Pioneer 2691. Oat yields ranged from a high of 96.7 bu/ac for Horizon 314 to a low of 62.2 bu/ac for SS 76-30.

AGRONOMIC STUDIES – COTTON: PRODUCTION STUDIES

EFFECT OF BURNDOWN HERBICIDES ON WINTER WEED CONTROL

N. W. Buehring, G. R. Nice, and R. R. Dobbs.

ABSTRACT: A field study was conducted in 2000 evaluating winter weed control with Roundup Ultra (glyphosate) alone or in combination with Goal (oxyfluorfen) or 2,4-D Amine applied as a burndown in early March. The results indicated that Roundup Ultra (glyphosate) at 0.75 lb ai/ac gave good (>86%) annual ryegrass (*Lolium multiflorum*), and wild garlic (*Allium vineale*) control and was as effective as in combination with Goal or 2,4-D Amine. Roundup Ultra at 0.5 lb ai/ac, alone or in combination with Goal or 2,4-D amine had only fair (≤ 81%) control of ryegrass and wild garlic.

EARLY AND MID-SEASON COTTON VARIETY TRIALS

N. W. Buehring, J. B. Creech, R. R. Dobbs, and G. R. Nice

ABSTRACT: The 2000 environmental growing season was highly variable with temperatures in late August and September $\geq 100^{\circ}$ F. Rainfall in May and August was 25 and 11% of normal, respectively. However, timely rainfall in June, July, and early September resulted in good yields. In the early maturity study, seedcotton yields ranged from 2407 to 3981 lb/ac of seedcotton. Fibermax FM958 had the highest yield of 3981 lb/ac and was not different from PSC 355, MISCOT 8806-3-2-19, MISCOT 8806-3-2-21 and Sure-Grow 501BR. The mid-season varieties yield ranged from 1956 to 3039 lb/ac of seedcotton. Fibermax FM 966 had the highest yield of 3039 lb/ac but was not different from AgriPro 4600, PSC 355, Stoneville X9905, and SureGrow 747.

COTTON VARIETIES RESPONSE TO CONVENTIONAL AND ROUNDUP WEED MANAGEMENT PROGRAM

N. W. Buehring, W. M. McCarty, R. R. Dobbs, and G. R. Nice

ABSTRACT: A study was conducted during the 2000 growing season comparing selected productive Roundup Ready cotton varieties in conventional or Roundup (glyphosate) weed control management systems. Commonly grown productive conventional varieties were also included as a standard for comparison in conventional weed management. The study was established in a field where weed infestations of pitted morningglory (*Impomea lacunosa*) and pigweed (*Amaranthus sp.*) were light to moderate. Both weed management systems were at high levels. The results indicated that Roundup Ready-BT varieties showed no difference between management systems with seedcotton yields ranging from 2800 to 3152 lb/ac. Conventional varieties, Stoneville 474, Sure-Grow 501, and Phytogen 355 yield were equal to Sure-Grow 501BG/RR, Deltapine 451BG/RR, Paymaster 1218BG/RR, and Stoneville 4892BG/RR in both conventional and Roundup weed management systems. Conventional variety Stoneville 747 was lower in yield than Sure-Grow 501BG/RR under conventional weed management and Paymaster 1218 BG/RR only under Roundup weed management. These results indicate that conventional weed management had no negative effect on Roundup/bollworm tolerant cotton varieties or conventional varieties. The data indicates that Roundup-BT tolerant varieties can be grown in either weed management program.

COMPARISON OF ROUNDUP READY VARIETIES FOR TWO YEARS IN THE BLACKBELT

J. R. Johnson and J. R. Saunders

ABSTRACT: Six Roundup Ready cotton varieties were evaluated for two consecutive years to determine if spraying Roundup over the top or over the top plus a directed spray reduced the yield potential of the variety. The study was conducted in Noxubee County on a Brooksville silty clay loam soil. Each variety had Roundup sprayed over the top and over the top and directed. The check plots had no Roundup sprays and weeds and grasses were controlled using Staple and Select. In either of the years there was no indication that Roundup caused any boll shed, abortion, hawk-billed bolls, or cavitation of bolls. In 1999 there was no difference in variety performance due to the Roundup sprays. In 2000 four of the six varieties tested had lower yields after being sprayed with Roundup over the

top or a combination of Roundup over the top and directed spray. It should be noted that 2000 growing season was a very dry year leading to high plant stress.

EVALUATION OF ROUNDUP TOLERANCE IN ROUNDUP READY COTTON VARIETIES

J. R. Johnson , J. R. Saunders and Ted Wallace

ABSTRACT: Eleven of the most widely used Roundup Ready varieties were evaluated for maximum tolerance of Roundup. The varieties were sprayed at two weeks after emergence with an over the top application of Roundup and each week thereafter a directed spray of Roundup was sprayed underneath the leaves onto the plants stem. A total of four sprays were made on each variety. There were no classical symptoms to herbicide damage to the cotton plants after any of the sprays. The undue shedding of boll and squares, hawk-billed bolls and boll cavitation was not detected. The weather was extremely hot and dry, however, very little shedding took place in the study. Shedding was equal in the nonsprayed and the sprayed plots indicating that shedding was not caused by the Roundup on the cotton. There were some varieties with significant differences between sprayed and nonsprayed. These yield difference were always in favor of the Roundup sprayed treatment over the nonsprayed treatment.

UNR COTTON RESPONSE TO SEEDING RATES

N. W. Buehring, M. H. Willcutt, G. R. Nice, and R. R. Dobbs.

ABSTRACT: A field study was conducted on a Catalpa silty clay soil evaluating cotton response to seeding rate in ultra narrow row (UNR) 7.5 and 9.5 inches wide. Seeding rates ranged from 70,000 to 300,000 seed/ac. Plant populations ranged from 41,000 for 30-inch row standard at 70,000 seed/ac to 191,000 plants/ac for the 9.5 inch 300,000 seed/ac treatment. Percent lint ranged from 26 to 27.1 with no differences. Lint yield ranged from 884 lb/ac to 1038 lb/ac with no treatment differences.

ULTRA NARROW ROW (UNR) COTTON RESPONSE TO SOIL INSECTICIDES FOR EARLY SEASON INSECT CONTROL

R.R. Dobbs, N.W. Buehring, J.T. Reed, G.R.W. Nice, and M. H. Willcutt

ABSTRACT: A field study was conducted on a Catalpa silty clay loam soil, Verona, Mississippi, evaluating ultra narrow row (UNR) cotton response to selected soil in-furrow insecticides for early season insect control (aphids and thrips). Cotton was planted on 5/30/00 at 150,000 seed per acre in 9.5 inch rows with a vacuum planter. Plant populations were equal for all treatments ranging from about 112,000 to 122,000 plants per acre. Aphid counts were lowest for the two higher rates of Temik, 1.5 and 2.1 lb ai/ac, and the Gaucho 0.25 lb ai/100 lb seed/Temik 1.05 lb ai/ac combination treatment. Immature thrip counts were equal for all treatments. Thrip damage was higher for the check than other treatments. Lint yields were equal for all treatments that received insecticide, and were higher than the check yield of 1192 lb ai/ac.

EVALUATION OF ULTRA NARROW COTTON FOR THE HILL SECTION OF MISSISSIPPI

J. R. Johnson and J. R. Saunders

ABSTRACT: Growing cotton in rows of 7.5 and 10 inches has grown in popularity over the past three years in the Hill Section of Mississippi. This past year there were several thousands acres grown in ultra narrow rows (7.5-10") across the northern part of the state. In our study we evaluated cotton grown in 7.5-inch row spacing at 90,000, 120,000, 150,000, and 180,000 plants per acre. The growing season was short and hot with little rainfall. However, the plants set fruit early and retained most all the bolls set. The plants had completely shut down 100 days after emergence with many of the bolls open. The boll dry weight at cutout was the highest for the 180,000 plants per acre. Yield was highest for the 180,000 plants per acre in our study.

EVALUATION OF ROW SPACING FOR COTTON

J. R. Johnson and J. R. Saunders

ABSTRACT: Many factors have come into play over the past several years to allow growth of cotton in rows narrower than the traditional row spacing. Some of these are better and more precise drill planters, more efficient harvesting equipment and genetic modified cottonseed with herbicide and insect resistance bred into the plants. In our study we found, as the row became narrower and the population within the row increased the plants became shorter. Plant survival rate decreased with an increase in plant population. Barren plants increased with an increase in plant population for each row spacing. When the plant density became greater than three plants per square foot the percent of barren plants was approximately 30% in the field. Boll size was also greatly affected by row spacing and plant population. Boll size was the greatest for the low population and wider rows and lowest for the high population and narrower rows. Yields were the highest when the plants were more evenly spaced in both directions in the field. The highest yield was with a plant spacing of 1.5 plants per square foot in the 15 inch row spacing.

EVALUATION OF SKIP ROW PLANTING PATTERN FOR COTTON IN THE HILLS

J. R. Johnson and J. R. Saunders

ABSTRACT: Skip row cotton has not been a popular planting practice for the Hill Section of Mississippi. This is due mainly to the lack of acres available for production. However, over the past few years the total production per acre has become more important than the total acres farmed. A second factor is the dry growing conditions experienced in the past two growing seasons and the lack of irrigation for the Hill Section. A study was conducted on Keith Morton's farm near Faulkner, Mississippi in 2000 evaluating 2X1 and 4X1 skip row pattern. In comparing the plants dry weight, the 2X1 skip pattern had higher dry than the outside or inside rows of the 4X1 pattern. Dry weight of fruit was much higher for the 2X1 skip than the inside or outside rows of the 4X1 skip. Yields were significantly higher for the two outside rows of the 4X1 skip than the 2X1 skip or inside rows of the 4X1 skip.

EVALUATION OF CHICKEN LITTER AS A NITROGEN SOURCE FOR COTTON

J. R. Johnson and J. R. Saunders

ABSTRACT: Chicken broiler litter and its value as a fertilizer, especially as a nitrogen source for cotton has increased in importance over the past several years. Several ongoing studies are underway evaluating chicken litter as a nitrogen source for cotton within MAFES AND USDA-ARS research programs in Mississippi. Several producers within the state and region of North Mississippi have been applying chicken broiler litter for several years and reaping the benefits of N-P-K from the litter. In our study we only evaluated the nitrogen value of the chicken broiler litter. Using a Minolta NO₃-N sap analysis the NO₃-N level in the petiole was significantly higher in the broiler litter than the 0 and 30 lb. level at the first week of bloom. In the fourth week of bloom, petiole sap analysis for the litter treatment was higher than the 0, 90, and 120-lb level. Leaf fluorescence at the first and fourth week of bloom was higher for the litter than the 0 level of nitrogen. Yields were higher for the litter treatment than the 0 and 30 lb. level of nitrogen.

COTTON RESPONSE TO FOLIAR NUTRIENT APPLICATION

N. W. Buehring, R. R. Dobbs, and G. R. Nice

ABSTRACT: A study was conducted evaluating the influence of foliar slow release N (CoRoN, 25-0-0, N-P-K) or N + K [CoRoN, 10-0-10, (N-P-K) plus 0.5% B] liquid solutions applied either at pinhead square or sequential applications starting at pinhead square. The environmental growing season for 2000 was highly variable with mostly below normal rainfall and above normal $\geq 100^{\circ}$ F temperatures in late August and early September. However, due to timely rainfall events, cotton yields were above normal and foliar fertilizer treatments had no visual effect on cotton growth and maturity. The CoRoN (10-0-10, plus 0.5% B) at 1 gpa applied at first bloom and repeated 9 days after first bloom had 113 lb/ac more lint than the check. CoRoN (10-0-10 plus 0.5% B) applied at first bloom and repeated 9 days after first bloom or CoRoN [25-0-0, (N-P-K)] applied pinhead square showed no difference in lint yield. This research will be continued in 2001.

COTTON RESPONSE TO STARTER FERTILIZER AND DXL 500 ON LEEPER FINE SANDY LOAM AND LEEPER SILTY CLAY LOAM SOILS

N. W. Buehring, R. R. Dobbs, and G. R. Nice

ABSTRACT: Two field experiments were conducted during the 2000 growing season evaluating starter fertilizer (10-34-0, N-P-K) alone and in combination with DXL 500, (thermal polyaspartate) for increased yield on a Leeper fine sandy loam and a Leeper silty clay soils. DXL 500 was applied alone or with starter fertilizer 2 inches from row x 2-inch depth at planting (5/24/00) or sidedress 6 inches from row and 2 inch deep in combination with liquid 32% N (UAN) solution applied at pinhead square. The mean seedcotton yield for the clay and sandy loam soils were 2930 and 2394 lb seedcotton/ac, respectively. Both soils indicated that starter fertilizer (10-34-0) applied alone or in combination with DXL 500 or DXL 500 as a tank mixture with liquid UAN (32% N) applied sidedress had no effect on seedcotton yield.

EVALUATION OF COVER CROPS FOR COTTON PRODUCTION

J. R. Johnson and J. R. Saunders

ABSTRACT: Cover crops are an important part of conservation tillage. Cover crops not only serve as a means of protecting the soil from winter erosion but also can serve other purposes. In the case with legumes, it is a nitrogen source for the crop to follow the legume. In our study when we monitored the plant growth and development during the growing season. The plots that had a cover crop showed no difference in growth and development for the first fourteen weeks of the growing season than those that received 60lb ac of inorganic nitrogen. However, at the end of the growing season the boll weight was significantly higher for the cover crop than for the native vegetation. Yields were the same for the cotton after a cover crop as 60 lbs of inorganic nitrogen applied to the cotton, regardless of the preplant tillage operation.

GROWTH AND DEVELOPMENT COMPARISON IN TILLED AND NO-TILLED COTTON

J. R. Johnson and J. R. Saunders

ABSTRACT: Plants from a conventional tilled and no-tilled planting were dug and portioned into leaves, stem, roots, squares and bolls starting two weeks after planting and continuing until the sixteenth week after planting. The highest percentage of the dry weight was in the leaves for the first twelve weeks after planting. At twelve weeks after planting the stem dry weight and the square dry weights reached their peaks. Dry weights of the no-till plants were numerically higher in leaves, stems, roots and squares for the first twelve weeks after planting. Total dry weights at the end of the growing season were higher for the no-till than the conventional tilled cotton. The boll dry weight for the conventional tilled and no-tilled cotton was nearly identical at the end of the growing season, which was reflected in the yield

COTTON RESPONSE TO BED RENOVATION

N. W. Buehring, R. R. Dobbs, and G. R. Nice

ABSTRACT: Studies were conducted during the 2000 growing season evaluating cotton yield response to time of bed renovation on a Leeper silty clay loam and a Leeper fine sandy loam soil. The cotton growing season environmental conditions were favorable early with very unfavorable conditions in late August and early September ($\geq 100^{\circ}$ F) with 44 days from late July through early September with no rainfall above 0.35 inches. However, seedcotton yields were above normal due to low insect infestations and timely rains in May through September. Seedcotton yields ranged from 2847 to 3440 lb/ac across both soils. Bed renovation in April or at planting or a doall before planting did not increase yield when compared to planting no-till into a fall paratill-bed rolled system.

COTTON RESPONSE TO TILLAGE IN A CORN ROTATION SYSTEM

N. W. Buehring, W. R. McCarty, G. R. Nice, and R. R. Dobbs

ABSTRACT: Seven tillage methods in continuous cotton and cotton following ridge-tillage corn in a rotation were evaluated on a Marietta silt loam soil in the 2000 growing season. Rainfall during the growing season was highly variable with below normal rainfall in March, May, July, August, and September. Above normal rainfall of 233% and 133% occurred in April and June, respectively. However, timely rainfall in June, July, and early September resulted in cotton lint yield mean of 1163 lb/ac. Except for the ridge-tillage treatment, cotton following ridge-tillage corn had increased yield from 84 to 239 lb lint/ac when compared to continuous cotton. In continuous cotton, except for ridge-tillage, all reduced tillage systems had higher lint yield than conventional tillage. In the rotation, all reduced tillage systems and conventional tillage had higher yield than ridge-tillage yield of 1058 lb lint/ac. Corn residue increased ground residue cover in all tillage systems. The reduced tillage systems also had increased ground residue cover.

DEVELOP EROSION CONTROL TILLAGE SYSTEMS FOR COTTON, CORN, SOYBEAN, AND RYEGRASS

K.C. McGregor, R.F. Cullum, J.S. Schreiber,
S.M. Dabney, G.V. Wilson, and J.R. Johnson

ABSTRACT: A literature survey summarized the beneficial effects of crop residues on soil erosion. Recent and historical (40-years) crop yield, runoff, and soil loss erosion data from crop production plots, erosion plots, and small watersheds illustrated the erosion control effectiveness of various conservation tillage practices. The erosion control effectiveness of no-till (NT) crops and grass buffer strips on idle land being returned to row-crop production provided useful information related to the potential return to row-crop production of land previously in the conservation reserve program (CRP). Other continuing erosion control studies included the evaluation of soil and water conservation management of poultry waste-amended ryegrass systems, long-term effects of NT and conventional-till (CT) practices on crop yields for a 16-year period (1984-1999), and stiff grass hedges with reduced-till and CT ultra narrow-row cotton. Ryegrass tillage treatments included a short fallow period (planted immediately after tillage), a long fallow period (planted one month after tillage), and no-till. Two-year average soil losses from each of these treatments averaged less than 1 t/ac. A recent topographic survey revealed dramatic differences in elevation between no-till and conventional-till plots after 17 years. The net loss for a 100 ft long reach for conventional-till as compared to no-till averaged 8 inches.

STAPLE AND COTORAN PREPLANT FOR ROUNDUP READY COTTON PRODUCTION

J. R. Johnson and J. R. Saunders

ABSTRACT: Roundup Ready technology in cotton provides an opportunity for producers to make all herbicide application post emergence thereby omitting any preplant incorporated or preemergence herbicide application. A study was started at Holly Springs, Nesbit, and Brooksville to evaluate a tank mix of Cotoran and Staple sprayed at the full rate and one-half rate as a preemergence on cotton. Cotoran provides grass and some weed control while Staple provides control of weeds especially morning glory in which Roundup is poor in controlling. There was a significant difference in seedling disease for the plots at Holly Springs, Nesbit and Brooksville although a granule fungicide was used at planting. Seedling disease or thrip infestation did not increase the herbicide injury in the full rate or half rate application. When the plots were rated visually for weed control before harvest, a noticeable difference was observed in the plots where no preemergence was used for morningglory control and there was more grasses than in the plots where a preplant was used. Yields were higher at Nesbit with the half-rate and no difference was observed within treatments among the other locations.

COTTON SEED TREATMENT EVALUATION TRIAL

Jack T. Reed, D. Bao, and C. S. Jackson

ABSTRACT: Insecticides used as seed treatments for control of thrips in seedling cotton were evaluated in comparison with a standard, in-furrow insecticide. Tests were planted at the North Mississippi Research and

Extension Center, Verona, MS, and at the Plant Science North Farm at Mississippi State University. Insect pressure was light in both locations and no significant crop related effects of thrips or treatments for thrips control was evident at the Verona location except for visually reduced damage from thrips in all treated plots as compared to the untreated check. Insecticide treatments significantly reduced stunting, delay in first bloom, the number of plants without blooms on one sample date, and visual plant damage in plots at the MSU location. Although there was a trend toward increased yield in treated plots as compared with the untreated check, there were no statistically significant differences in yield at either location.

AGRONOMIC STUDIES – COTTON: INSECT MANAGEMENT TRIALS

FIELD CAGE EVALUATION OF INSECTICIDES FOR TARNISHED PLANT BUG MANAGEMENT ON COTTON IN MISSISSIPPI, 2000

Jack T. Reed, D. Bao, and C. S. Jackson

ABSTRACT: The purpose of this trial was to evaluate insecticides for control of tarnished plant bug, *Lygus lineolaris* (*Palisot de Beouvois*), on cotton. Tarnished plant bugs were reared by the Gast Rearing laboratory and caged in cloth sleeve cages after plots were sprayed and the spray had dried. Under the conditions of this trial, Steward 1.25SC and Provado 1.6F provided more than 50% control, and Centric 25WG provided about 80% control of tarnished plant bugs. Bidrin 8E, Centric 25WG, Capture 2EC, and Vydate 3.77L compounds resulted in more than 90% mortality in 48 hours.

A COMPARISON OF DIFFERENT CHEMICAL ATTRACTANTS FOR TRAPPING MAY/JUNE BEETLES

Pheromone Trapping Study:

Michael R. Williams, Paul Thompson, Bill Burdine, Jeff Main, Noreen Thomas and Stan Wise III

Abstract: This is the continuation of a cooperative study with Dr. Abner Hammond, LSU, comparing varying combinations of Valine and iso-Leucine for their ability to attract May/June beetles (*Phyllophaga sp.*). The two locations had definite peaks of *P. ephilida* in late June and late July. The 100% iso-Leucine was the most active and most consistent chemical attractant.

AGRONOMIC STUDIES – COTTON: COTTON-CORN ROTATION-TILLAGE

COTTON RESPONSE TO TILLAGE IN A CORN ROTATION SYSTEM

N. W. Buehring, W. R. McCarty, G. R. Nice, and R. R. Dobbs.

ABSTRACT: Seven tillage methods in continuous cotton and cotton following ridge-tillage corn in a rotation were evaluated on a Marietta silt loam soil in the 2000 growing season. Rainfall during the growing season was highly variable with below normal rainfall in March, May, July, August, and September. Above normal rainfall of 233% and 133% occurred in April and June, respectively. However, timely rainfall in June, July, and early September resulted in cotton lint yield mean of 1163 lb/ac. Except for the ridge-tillage treatment, cotton following ridge-tillage corn had increased yield from 84 to 239 lb lint/ac when compared to continuous cotton. In continuous cotton, except for ridge-tillage, all reduced tillage systems had higher lint yield than conventional tillage. In the rotation, all reduced tillage systems and conventional tillage had higher yield than ridge-tillage yield of 1058 lb lint/ac. Corn residue increased ground residue cover in all tillage systems. The reduced tillage systems also had increased ground residue cover.

LIVESTOCK STUDIES – BEEF

LOW INPUT FEEDING REGIMES FOR DEVELOPMENT OF FALL-BORN REPLACEMENT HEIFERS

R. R. Evans, L. R. Ballweber, R. D. Little, T. J. Engelken, R. L. Ivy, T. F. Best

ABSTRACT: Developing replacement heifers is an expensive part of the beef cattle enterprise. Producers are looking for systems that minimize inputs and labor while still providing sufficient nutrition to developing heifers to insure that they are large enough to breed at 14-15 months of age. In this study three feeding regimes were evaluated. Average daily gain (ADG) for heifers consuming a 16% protein commercial ration was 1.21 lb/h/d and the soybean hull ration was 1.24 lb/h/d when both were fed 8.0 lb/h/d for 154 days. The third treatment was a free choice heifer developer tub and the ADG for this treatment was 0.52 lb/h/d. Supplement cost per day for the above-mentioned rations were \$0.32/day for soybean hulls; \$0.32/day for the self-feeding tub and \$ 0.64/day for the commercial heifer developer. Two dewormers, a pour-on product, Eprinex® was compared to an injectable product, Ivomec®. Both products are type II dewormers developed by Merial, Inc. and both products were compared to an untreated control. There was no significant difference in total gain between heifers receiving either deworming product or between the untreated controls. There was, however, potentially a biologically significant weight difference (Ivomec, 19 lb and Eprinex, 25 lb) between the calves that did receive a dewormer and untreated controls. Small numbers of animals may not have allowed for statistical differences to be seen, but 19 pounds weight difference, in this age heifer, may be enough weight to not allow her to reach puberty and to exhibit estrus. Egg per gram (EPG) counts were significantly reduced ($p < .05$) in the Eprinex treated groups at day 28 of the study. This finding would be in line with the manufacture's evaluation of effectiveness for 21-28 days post treatment. The Ivomec group did not show significance but was numerically lower (forty (40) EPG) than the untreated controls. After day 28 EPG counts increased for all treatments but the egg counts were still lower at trial termination for both treated groups.

EFFECT OF TASCO® 14 MEAL ON THE REBREEDING OF FIRST CALF HEIFERS AND SECOND CALF COWS

R. R. Evans, R. L. Ivy, T. F. Best, and V. G. Allen

ABSTRACT: Tasco-Forage^{FM}, an extract from Brown Seaweed (*Ascophyllum nodosum*), when sprayed on pastures has been shown to increase immune function, increase carcass quality grade and extend the shelf life of meat products. This multi-year study was undertaken to determine if TASCO®14 Meal, a less potent form of the seaweed, would have a similar effect on steers when ingested through their dam's milk or in a mineral mixture. The seaweed meal was mixed at the rate of 0.05 pounds/head/day consumption for approximately 150 days. When cows consumed TASCO®14 Meal body temperature was reduced 0.5 ($p < .05$) and 0.3 degrees in cows and 0.7 ($p < .05$) and 0.1 degrees in calves in July and September, respectively. Cows consuming TASCO had lower respiration rates ($p < .05$), fewer flies per side ($p < .05$), but TASCO did not influence the numbers of cows grazing in direct sunlight. No difference was seen in rebreeding percentages.

SEAWEED (*Ascophyllum nodosum*) SUPPLEMENTATION FOR BACKGROUNDING WEANLING OR PURCHASED CALVES

R. R. Evans, T. F. Best, R. L. Ivy, and V. G. Allen

ABSTRACT: TASCOTM-Forage has been effective in increasing immune function in cattle when either applied to tall fescue pasture grazed by steers or by direct ingestion by cattle. Ability to boost immune function prior to an anticipated stress such as weaning and shipping could have far reaching effects on reducing morbidity and mortality of calves. Additional benefits could include less labor and facilities to handle sick cattle, decreased needs for antibiotics and other medications, improve carcass characteristics and grade at slaughter, and extended shelf-life of the meat during retail display. Previous research has suggested that introducing seaweed into the diet prior to an anticipated stress should position the animal to better tolerate stress and disease challenges but this needs to be tested. Thus, we propose to feed a seaweed containing supplement to southeastern beef calves just prior to weaning and to background beef calves bought through local sales in the southeast, prior to transportation to wheat pastures

and eventual feedlot feeding in western feed-yards. The overall objective is to improve health and reduce morbidity and mortality in beef calves shipped from southeastern pastures to the west for grazing followed by feedlot finishing and to measure the long term effects through slaughter and retail display. From the 1999 study, we determined that calves consuming seaweed had less sickness than calves not consuming seaweed. However calves that consume seaweed, while under shipping stress, exhibited more sickness than untreated calves. There was no difference in grazing ADG or feedlot ADG. Calves that had eaten seaweed prior to shipment from Mississippi to Texas had less shrink in transit (10 lb/calf) than controls. This trend was also seen when the calves were moved from grazing to the feedlot (5 lb/calf). Preliminary results indicate that steers fed seaweed meal yielded display case primal cuts that maintained a cherry red color longer ($P < .07$), had greater uniformity ($p < .02$) and had less discoloration ($p < .03$) and browning ($p < .02$) up to 21 days post harvest than untreated controls. Results were so encouraging that the trial was extended to further test the seaweed meal's influence on shelf-life.

PERFORMANCE OF STEERS GRAZING SUMMER PASTURE AND SUPPLEMENTED WITH BROILER LITTER

Katie C. Hanson, Brian J. Rude, and William B. Burdine, Jr.

ABSTRACT: Over 14 million tons of poultry waste are produced in the USA annually. In addition to being used as fertilizer, broiler litter can be fed to cattle as a means of disposal as well as serve as an inexpensive feedstuff. Broiler producers have recently begun adding aluminum sulfate (alum) to their litter to reduce volatilization of ammonia and to bind phosphorus. However, it is not known how the addition of aluminum sulfate to broiler litter may affect animal performance. The objective of this study was to determine the performance of steers fed broiler litter with or without aluminum sulfate while grazing summer forages. Steers consuming broiler litter with aluminum sulfate gained faster than those consuming traditional broiler litter or the control.

CULL SWEETPOTATO ROOTS CAN INCREASE CATTLE PROFITS

William B. Burdine, Jr., Brian J. Rude, Richard R. Evans, Terry J. Engelken, and Paul G. Thompson

ABSTRACT: Annually, tons of sweetpotatoes are discarded from the packing line. Lost production time and disposal expenses increase. In an effort to reduce these factors, cull grade sweetpotatoes were evaluated as an alternative feed source for beef heifers. After an 84 day feeding period, ADG was 2.0 lb/day for both a traditional wintering diet (4 lb corn + 1.75 lb cotton seed meal) and the sweetpotato-based diet (1.5 lb corn + 2.0 lb cotton seed meal + 10.0 lb SP). These results suggest that sweetpotato may be used as a substitute for more expensive feedstuffs without sacrificing weight gain. This strategy can reduce feed costs for livestock while reducing disposal costs for the sweetpotato packer.

LIVESTOCK STUDIES – DAIRY

TAIL DOCKING PROCEDURES TO PRODUCE HIGH QUALITY MILK

Thad O Riley , Donald E. Pogue, and Alan C. Rathwell

ABSTRACT: The dairy herd at North Mississippi Branch Experiment Station was randomly assigned into treatment and control groups. Treatment 1 was the removal of cows' tails 4 to 6 inches below the vulva. Treatment 2 was the removal of cows' tails above the long hair growth line (switch) of the tail end. Tails were not removed from control group. Milk somatic cell count (SCC) data was collected to determine the effectiveness of docked tails upon milk quality. Forty-six months of data has been collected on average milk production per cow, average milk somatic cell counts and visual inspection of cow comfort due to irritation from flies. Average daily milk production from treatment 1 and control groups was 60.98 and 60.09 lbs respectively. Average somatic cell counts were 3.56 for treatment 1 and 3.74 for control group. Treatment 2, the removal of the tail switch only, was initiated in April 1999. Nineteen months of data indicates a 3.49 SCC with 62.53 lbs average milk. Routine observation determined that fly populations per cow were not affected by tail length.

LIVESTOCK STUDIES – FORAGE

THE USE OF BROILER LITTER AS FERTILIZER ON BERMUDAGRASS FOR HAY

J. L. Howell, R. L. Ivy, J. R. Johnson, and J. R. Sanders

ABSTRACT: Thousands of acres of pastureland have been fertilized using broiler litter for many years. This has led to the possibility of nutrient run off, especially phosphorus. As livestock operations become more confined, the problem of retaining these nutrients will continue. This study was initiated to determine if, and at what level the nutrients would increase when chicken litter is applied to four different varieties of Bermudagrass; Coastal, Tifton 44, McDonald, and Sumrall 007. In this trial, fourteen lb of litter was applied to a 12' x 12' plot area of growing bermudagrass on July 14, 2000. Soil and forage samples were taken prior to application on this Grenada silt loam soil. Insufficient data has been collected to analyze at this time.

EFFICIENT MANAGEMENT AND UTILIZATION OF NEW AND IMPROVED FORAGE CROPS

J. L. Howell and R. L. Ivy

ABSTRACT: This study was initiated to evaluate new, improved, as well as standard varieties of forage crops. All plots were planted on a prepared seedbed. The experimental design was a randomized complete block design with four replications. These data were analyzed within harvest dates. Thirty-eight varieties of ryegrass were planted on October 25, 1999. All ryegrass plots were harvested four times. The four harvest dates from February 23, 2000 through May 4, 2000 produced a range from a high of 5683 lb dry matter/ac for FLX 1998 (SII) LR to a low of 4380 lb/ac for Major. Sixteen varieties of bermudagrass varieties were evaluated in four harvest dates from May 24, 2000 through August 29, 2000. These varieties ranged from a high of 5583 lb dry matter/ac for Coastal to a low of 1663 lb dry matter/ac for Lancaster. Nine varieties of warm season perennial grasses were evaluated in 2000. They were harvested twice producing a high of 7132 lb dry matter by Alamo to a low of 3301 lb dry matter by PMC 9029926. Seven Dallisgrass varieties were harvested four times from May 24, 2000 through September 27, 2000. These produce a range from a high of 10815 lb dry matter per acre for 460 to a low of 4897 lb for Common.

RESPONSE OF WARM SEASON PERENNIALS TO NITROGEN IN 2000

J. L. Howell, R. L. Ivy, D. L. Lang, and R. L. Elmore

ABSTRACT: This study was initiated in 1997 to determine the yield, quality and persistence of switchgrass to different levels of nitrogen. The experimental design was a randomized complete block with four replications. Three varieties of switchgrass were planted on a Houston clay (very fine, montmorillonitic, thermic, Typic Chromuderts) soil. Three different nitrogen levels were used, 0, 30, and 60 lb/ac, after each harvest. In 2000, as in previous year, the 60-lb nitrogen rate produced higher yield, however only two harvest dates were taken in 2000.

DALLISGRASS ECOTYPE EVALUATION AT HOLLY SPRINGS

J. L. Howell, R. L. Ivy, J. R. Johnson, and J. R. Sanders

ABSTRACT: Seven ecotypes of dallisgrass were transplanted at the North Mississippi Branch Experiment Station at Holly Springs in late summer of 1999. The trial is being conducted on a Grenada silt loam soil. The experiment is being conducted using a randomized complete block with four replications. In addition to collecting yield dates, evaluations of cold tolerance will be made. Three harvests were made during the summer of 2000.

MEANS OF RENOVATION OF STANDS OF TOXIC ENDOPHYTE TALL FESCUE

R. L. Ivy, G. B. Triplett, M. L. Broome, D. R. Reynolds, D. J. Lang, J. L. Howell, and K. M. Bloodworth

ABSTRACT: Tall fescue is the most important cool season perennial forage grass in the United States. The toxic endophyte (*Neotyphodium coenophialum* [(Morgan-Jones and Gams) Glenn, Bacon, and Hamlin]) has been

implicated in lower animal performance. Recent developments have generated new interest in tall fescue. The development and release of new novel endophyte tall fescue may increase animal performance. The renovation of old endophyte infected pastures and establishment of new novel endophyte tall fescue pastures can be expensive (estimated at over \$200 per acre). As a means of reducing renovation costs, the existing fescue stand could be killed and a crop of no-tillage corn grown before making the new fescue seeding. In earlier research, several herbicide combinations eradicated tall fescue and suppressed or controlled warm season perennial species with adequate safety for the corn crop. Transgenic hybrids tolerant to post-emergence application of glyphosate, glufosinate, sulfosate and other effective herbicides will contribute to the effectiveness of the system. Successful corn production will involve transgenic hybrids planted into sod around April 1. Earlier work with no-tillage corn planted into sod and managed properly averaged more than 100 bu/ac in Mississippi. The value received from corn could defray most, or all, of the cost of renovation. A no-tillage corn study was initiated in the spring of 2000. Environmental conditions resulted in no harvestable corn. Seeding of novel endophyte tall fescue following corn will be in then the fall of 2000.

PERFORMANCE OF HEIFERS ON NOVEL ENDOPHYTE-INFECTED TALL FESCUE

R. L. Ivy, T. F. Best, J. L. Howell, D. J. Lang, and R. L. Elmore

ABSTRACT: Endophyte free (F) tall fescue was developed and released as a new forage crop for livestock. Problems developed with plant persistence causing loss of stands from F tall fescue. A novel endophyte strain (N⁺) has been developed which is animal friendly and imports persistence to the tall fescue plant. The objectives of this study were to evaluate animal performance, stand persistence and ground cover of tall fescue cultivars. Paddocks were stocked March 23, 2000 at 600 lb/ac. Heifers were removed May 16, 2000 for a total of 56 days on the study. Average daily gain was 3.0, 3.7, 2.6, 2.5, 2.5, 2.4, and 2.4 for Georgia 5 N⁺, Georgia 5 E⁺, Georgia 5 E⁻, Jesup E⁻, Jesup N⁺, Jesup E⁺, and Kentucky 31⁺, respectively. Georgia 5 (+/N⁺) average daily gain was significantly higher than Jesup (+/N⁺) and Kentucky 31⁺. There was no significant difference between Georgia 5 N⁺, Georgia 5⁺, and Georgia 5⁻. There was no significant difference between Georgia 5 E⁺, Georgia 5 E⁻, Jesup E⁻, Jesup N⁺, Jesup E⁺, and Kentucky 31⁺.

DEVELOP EROSION CONTROL TILLAGE SYSTEMS FOR COTTON, CORN, SOYBEAN, AND RYEGRASS

K.C. McGregor, R.F. Cullum, J.S. Schreiber, S.M. Dabney, G.V. Wilson, and J.R. Johnson

ABSTRACT: A literature survey summarized the beneficial effects of crop residues on soil erosion. Recent and historical (40-years) crop yield, runoff, and soil loss erosion data from crop production plots, erosion plots, and small watersheds illustrated the erosion control effectiveness of various conservation tillage practices. The erosion control effectiveness of no-till (NT) crops and grass buffer strips on idle land being returned to row-crop production provided useful information related to the potential return to row-crop production of land previously in the conservation reserve program (CRP). Other continuing erosion control studies included the evaluation of soil and water conservation management of poultry waste-amended ryegrass systems, long-term effects of NT and conventional-till (CT) practices on crop yields for a 16-year period (1984-1999), and stiff grass hedges with reduced-till and CT ultra narrow-row cotton. Ryegrass tillage treatments included a short fallow period (planted immediately after tillage), a long fallow period (planted one month after tillage), and no-till. Two-year average soil losses from each of these treatments averaged less than 1 t/ac. A recent topographic survey revealed dramatic differences in elevation between no-till and conventional-till plots after 17 years. The net loss for a 100 ft long reach for conventional-till as compared to no-till averaged 8 inches.

HORTICULTURE STUDIES – SWEETPOTATOES

REGIONAL SWEETPOTATO VARIETY TRIAL

Jeff L. Main, Noreen G. Thomas, and Paul G. Thompson

ABSTRACT: Advanced breeding lines from sweetpotato breeding programs in Mississippi, Louisiana, North Carolina and the U.S. Vegetable Laboratory in South Carolina were evaluated for yield. MS-K39 was the leading entry in U.S. No.1 production, but was not significantly different than nine additional orange fleshed entries including the control cultivar 'Beauregard'. MS-K39 produced a greater jumbo yield than other entries.

FOUNDATION SWEETPOTATO SEED PROGRAM

Paul G. Thompson, Noreen G. Thomas, Jeff L. Main, and William B. Burdine, Jr.

ABSTRACT: A foundation sweetpotato seed stock program is maintained at the Pontotoc Experiment Station. The goal of the program is to maintain high quality seed stock which is genetically pure and disease, virus, and insect free for Mississippi's sweetpotato producers. A transition to the production of virus indexed foundation seed stock was made at the Pontotoc Station in November, 1999. All subsequent seed stock production will be virus indexed. In 2000, virus indexed G1 'Beauregard' seed stock were produced from G0 plants obtained from Louisiana State University. Those plants were increased in a greenhouse at the Pontotoc Station remodeled to meet certification standards for the production of virus indexed plants. G1 roots were produced in isolation at the station. All 'Beauregard' foundation seed sold in 2001 will be virus indexed. This seed is produced from original virus tested seed maintained at Louisiana State University. Preliminary studies have shown that virus indexed (VT) seed stock produced greater yields, more uniform sized and shaped roots with smoother, brighter skin (Thompson, et al., 1999). Production of G1 roots was low in 2000 due to problems with greenhouse plant increase and plant survival after transplanting to the field.

SWEETPOTATO YIELD RESPONSE TO TRANSPLANT LENGTH

Noreen G. Thomas, Paul G. Thompson, and Jeff L. Main

ABSTRACT: An 8 to 12 in sweetpotato transplant is widely considered the ideal length. Shorter and longer plants are unavoidable when mechanical plant cutters are utilized. Subsequently, plants that are not the ideal length are often transplanted. This was the second year of a study to determine if transplant length influenced yields. In 1999, 8 in and 11 in transplants produced the greatest U.S. No.1 yield compared to 5 and 14 in. Eleven in plants produced the greatest jumbo and total marketable yields. In 2000, 6, 9, 12, and 15 in plants were compared. The procedure used for obtaining plants of specified lengths in both 1999 and 2000 was to select plants of the correct length from the same field bed and cutting about one in above the soil level, i.e., plants of each length were selected in the bed and not cut to length. In 2000, 12 in plants were the highest ranking for U.S. No.1 yield, but were not significantly greater than 15 in which was intermediate between 12 and the 6 and 9 in plants. Twelve in plants also produced the greatest canner and total marketable yields. In 1999, 8 and 11 in plants produced 36 boxes of U.S. No.1 roots more than 5 in plants. In 2000, 12 in plants produced 109 boxes of U.S. No.1 compared to 47 boxes from 6 in plants. This is an average increase of 40% in U.S. No.1 from 11-12 in plants over 5-6 in plants. Consequently, small plants should be discarded rather than transplanted if sufficient numbers of 10-12 in plants can be produced.

EVALUATION OF VIRUS TESTED VS VIRUS INNOCULATED PLANTS OF SIX SWEETPOTATO CULTIVARS

Jeff L. Main, Noreen G. Thomas, and Paul G. Thompson

ABSTRACT: The six cultivars, Beauregard-63, Jonathan, NC-262, Tanzania, Wagabolige, and Xushu-18, were selected by an international panel to compare yield and quality of virus tested plants to plants that were graft inoculated with viruses. Yields were low due to the late date of transplanting, drought, and early frost. Too few storage roots were produced to observe and measure differences in root quantity or quality due to virus infection.

SWEETPOTATO BREEDING

Paul G. Thompson, Jeff L. Main, and Noreen G. Thomas

Approximately 7000 seedling plants from true seed produced in 1999 polycross blocks were evaluated in a field trial at the Pontotoc Experiment Station. Thirty four plants were selected and will be further selected for storage ability and plant production. Those selected will be included in first year selection trials in 2001.

First year selections from seedling plants were field evaluated in 2000 and eight lines were selected for inclusion in the advanced line trials in 2001. Second year and advanced selections were evaluated in separate field trials. Those evaluations are described in the following reports.

SWEETPOTATO BREEDING: SECOND YEAR BREEDING LINE EVALUATIONS

Paul G. Thompson, Jeff L. Main, and Noreen G. Thomas

ABSTRACT: Nine breeding lines in their second selection season were evaluated for yield, flesh color, external root quality and freedom from disease in a 2000 field trial. M004 produced the greatest U.S. No.1 yield of entries tested including the control 'Beauregard'. M020 was second in rank for U.S. No.1 yield and produced the greatest jumbo yield of entries tested. Potential for both of these lines appears promising for cultivar development.

SWEETPOTATO BREEDING: ADVANCED BREEDING LINE EVALUATIONS

Paul G. Thompson, Jeff L. Main and Noreen G. Thomas

ABSTRACT: In 2000, three advanced breeding line trials were conducted to evaluate lines selected in at least two previous seasons. Characters evaluated included yield, flesh color, external root quality and freedom from disease. One trial was conducted at Cane Creek Farms in Calhoun County, MS and two trials were conducted at Ferguson Farms in Pontotoc County, MS. Yields were low at Cane Creek Farms due to insufficient rainfall. No differences in U.S. No.1 yield was observed between the orange fleshed breeding lines, I52, K39, K124 and the control cultivar 'Beauregard'. I1 and I23 were the highest yielding white fleshed breeding lines and were not different than 'Beauregard' in U.S. No.1 yield. In trial 1 at Ferguson Farms, K39 produced the greatest U.S. No.1 yield. The Ferguson 1 trial was the only one that included third year selections ('L Lines') due to lack of availability of plants. Four of those lines were not different than 'Beauregard' in U.S. No.1 yield and have potential for cultivar development. I23 and J162W produced the greatest U.S. No.1 yields of white fleshed entries. In trial 2 at Ferguson Farms, 'Beauregard' and I52 produced the greatest U.S. No.1 yields of orange fleshed entries, but I52 was not significantly different than the remaining orange fleshed lines. The greatest U.S. No.1 yields by white fleshed entries were by I1 and I23 which were greater than J162W and O'Henry, the white fleshed control cultivar. Although, mean yields of most grades over the three locations could not be compared due to entry x location interactions, there was a trend for K39 and 'Beauregard' to produce greater U.S. No.1 and total marketable yields than other orange fleshed entries. I1 and I23 tended to produce the greatest U.S. No.1 yields among white fleshed entries and were comparable to the orange fleshed 'Beauregard' and K39.

CULL SWEETPOTATO ROOTS CAN INCREASE CATTLE PROFITS

William B. Burdine, Jr., Brian J. Rude, Richard R. Evans, Terry J. Engelken, and Paul G. Thompson

ABSTRACT: Annually, tons of sweetpotatoes are discarded from the packing line. Lost production time and disposal expenses increase. In an effort to reduce these factors, cull grade sweetpotatoes were evaluated as an alternative feed source for beef heifers. After an 84 day feeding period, ADG was 2.0 lb/day for both a traditional wintering diet (4 lb corn + 1.75 lb cotton seed meal) and the sweetpotato-based diet (1.5 lb corn + 2.0 lb cotton seed meal + 10.0 lb SP). These results suggest that sweetpotato may be used as a substitute for more expensive feedstuffs without sacrificing weight gain. This strategy can reduce feed costs for livestock while reducing disposal costs for the sweetpotato packer.

SWEETPOTATO YIELDS AS AFFECTED BY BED WIDTH AND PLANT SPACING

William B. Burdine, Jr., Paul G. Thompson, Jeff L. Main, Noreen G. Thomas, and Grover Triplett

ABSTRACT: An experiment was begun to test different field bed widths with multiple rows of plants on wide beds and different plant spacings within rows. Bed widths included standard beds 30 in and 40 in center to center with a single row of plants on each bed. Wider beds were 60 inches and 80 inches with 3 rows of plants per bed. Plant spacings within rows were 9, 12 and 15 in.. The experiment was conducted in Pontotoc County at Ferguson Farms. The experimental design used was 3 x 4 factorial arrangement of treatments in a randomized complete block containing four replications. A standard bed 40 in apart with a single row of plants was the highest ranking for U.S. No.1 yield although it was not significantly greater than closer plant spacings in 40 in beds or the 80 in bed with 12 in plant spacing. Due to low rainfall, moisture was restricted and sizing of roots with close spacing was limited. Additional analyses are needed, and will be completed, to derive more information on the effects of bed widths and plant spacings from the study.

FEASIBILITY OF PROGRAMMED FOLIAR INSECTICIDAL APPLICATION FOR INSECT CONTROL IN SWEETPOTATO

Michael R. Williams, Paul Thompson, Bill Burdine, Jeff Main, Noreen Thomas, and Stan Wise, III

Abstract: It is generally thought that foliar insecticide applications to sweetpotatoes will significantly reduce insect damage and result in fewer culls because of insect injury. Weekly applications of PennCap M compared with as needed applications (determined by weekly scouting) were not significantly better than control plots, which received no insecticide. Insect pressure was light, probably contributing to the lack of differences.

SWEETPOTATO YIELD RESPONSE TO TRANSPLANTS WITH AND WITHOUT LEAVES

Noreen G. Thomas and Paul G. Thompson

ABSTRACT: Present day sweetpotato production includes the use of transplants that often have no leaves. Yield from leafless transplants may be lower. Should the leafless transplants be discarded? A preliminary study was conducted to determine yield response to transplants with and without leaves. Transplants 12 inches long were hand cut from beds. The leaves were then removed by hand for the 'no leaf' treatment. The plants were then transplanted by hand into the field. Plant survival in both treatments was near 100%. There were no differences between the two treatments in U.S. No.1, canner, jumbo, cull or total marketable yield. There was a difference in total yield (including culls) between treatments with the transplants with leaves having a significantly higher total yield. These results show that transplants with or without leaves are viable choices to plant.

EFFECTS OF SPATIAL VARIABILITY ON SWEETPOTATO YIELD

Mark W. Shankle and Jeff L. Main

ABSTRACT: Yield of US No. 1 and total marketable sweetpotato was positively correlated to soil organic matter, calcium, sulfur, and pH with r-values of at least 0.41. Percent clay ($r = -0.29$) was inversely related to canner yield. Penetrometer measurements at 5 and 10 cm depths were inversely related to canner yield and positively related to jumbo yield. Cull yield was positively related to all penetrometer measurements at 0, 5, 10, and 15 cm. This suggests that there can be an increase in cull amount with an increase in soil compaction. Total marketable yield was also inversely related to soil compaction at the 15 cm depth. Plant tissue nitrogen was inversely related to US No. 1 yield ($r = -0.67$) and positively related to canner yield ($r = 0.83$). Plant tissue potassium was inversely related to canner yield. Canner yield was also positively related to plant iron ($r = 0.83$) and jumbo yield was negatively related to plant copper ($r = -0.74$).

SWEETPOTATO YIELD MONITOR BASED ON OPTICAL IMAGING TECHNIQUES

J. Alex Thomasson, James R. Wooten, Swapna Gogineni, and Paul G. Thompson

ABSTRACT: Current yield monitors for root crops rely on a conveyor weighing system. This system depends on the assumption that practically all soil is removed from the conveyor chain before the weighing takes place. This assumption is often not valid in Mississippi, where sweetpotatoes tend to be grown in heavy clay soils that form clods that cannot be easily removed. The objective of this research project is to develop an optical system that (1) measures the yield of sweetpotato at a given point in a field, (2) classifies sweetpotatoes according to grade at the point of harvest, and (3) georeferences yields and grades so that spatial variability of sweetpotato yield and grade can be mapped within a field. In the fall of 1999, a digital camera system was constructed for taking color digital images on a standard sweetpotato harvester. Image-based measurements of sweetpotato size and classifications of sweetpotato grade compared well to actual scale weights and traditional manual classifications. In the fall of 2000, a 2nd-generation digital camera system was constructed for taking color digital images on a sweetpotato harvester. The field system consists of a digital RGB progressive-scan camera mounted in an enclosure over the chain conveyor, a fluorescent and LED lighting system, and a portable-computer-based image acquisition system. Software has been written to control the collection of images such that they are collected in accordance with the speed of the conveyor. GPS has also been incorporated so that, with each image, a precise field location is recorded. Several hundred images were collected over several days of harvesting. Image-analysis software is being developed to analyze the sweetpotato images in the laboratory.

HORTICULTURE STUDIES – VEGETABLES, STRAWBERRY, AND MEDICINAL HERBS

SUMMARY OF VEGETABLE, STRAWBERRY, AND MEDICINAL HERBS RESEARCH PROJECTS CONDUCTED IN 2000

Kent E. Cushman, Thomas E. Horgan, and Mohammad Maqbool

ABSTRACT: The vegetable and small fruits project at Verona expanded its activities in 2000 to include a new project: Medicinal Herbs. Dr. Mohammad Maqbool was hired in July to assist with medicinal herbs plantings and he has already established several research studies with the American Mayapple (*Podophyllum peltatum*). One study will determine the best type of mayapple propagule to use for field establishment and also the best time of year to harvest and plant these propagules. Another study will determine the best mulch and weed control strategies for establishing field plantings of mayapple. Other studies, both in the greenhouse and in the field, will be established in the spring of 2001. The Medicinal Herbs project is working closely with the University of Mississippi's National Center for Natural Products Research. Cooperation between the two institutions may soon involve another medicinal herb, Black Cohosh (*Cimicifuga racemosa*), known for its estrogen-like compounds. The vegetable project, established five years ago, continues to conduct cultivar evaluations and research studies directed to improving cultural practices. Several cultivar evaluations were conducted during the 2000 growing season: triploid (seedless) watermelons, edible-podded peas, and strawberries. Plant population studies with pumpkin and sweet pepper were also conducted. Research from past years continued with investigations of swine effluent as a source of fertilizer and irrigation for the plasticulture production of vegetables. In the spring, early sweet corn was planted on black plastic to compare swine effluent to other, more conventional, fertilizers.

EDIBLE-PODDED PEA CULTIVAR EVALUATION

Kent E. Cushman, Thomas E. Horgan, and Muhammad Maqbool

ABSTRACT: Eight entries of edible-podded pea cultivars were evaluated at the North Mississippi Research & Extension Center in Verona during the spring of 2000. The cultivars were 'Norli,' 'Ho Lan Dow,' 'Blackeye Marofat,' 'Narikoma Express,' 'Oregon Sugar Pod,' 'Mammoth Melting,' 'Dwarf Grey Sugar,' and 'Oregon Giant.' There were no significant differences in total marketable yield between cultivars. As expected, there were highly significant differences in size of pods (pods/lb). 'Oregon Giant' produced the largest pod with the lowest number of

pods/lb (124) followed by 'Oregon Sugar' and 'Ho Lan Dow' with 152 and 156 pods/lb, respectively. 'Dwarf Grey Sugar' produced the smallest pod with the greatest number of pods/lb (346).

PLANT POPULATION AFFECTS BELL PEPPER YIELD

Kent E. Cushman and Thomas E. Horgan

ABSTRACT: Four plant populations were used to evaluate the plasticulture production of 'Vivaldi' bell pepper. Marketable yields were not significantly different for the three highest plant populations of 29040, 14520, and 9680 plants per acre. However, marketable yield of the lowest plant population of 7260 plants per acre was significantly lower than the other treatments. Plant population did not affect average fruit weight. Results of this 1-year experiment suggest that 9680 plants per acre is the optimum plant population to maximize yield and reduce costs of production without affecting fruit size.

THE EFFECT OF PLANT POPULATION ON PUMPKIN YIELD

Kent Cushman, Thomas Horgan, David Nagel, Muhammad Maqbool, and Pat Gerard

ABSTRACT: Pumpkin cultivars Aspen and Howden Biggie were planted at the North Mississippi Research & Extension Center in Verona during the summer of 2000 to investigate the effect of plant population on yield. Four plant populations for the cultivar Aspen were tested: 3068, 2045, 1361 and 908 plants/ac. These populations are equivalent to 14, 21, 32, and 48 ft²/plant, respectively. In a separate experiment, four plant populations for the cultivar Howden Biggie were also tested: 2045, 1361, 908 and 605 plants/ac. These populations are equivalent to 21, 32, 48, and 72 ft²/plant, respectively. 'Howden Biggie' produces a more vigorous vine than 'Aspen' and therefore plant population treatments were adjusted accordingly. There was a linear relationship between increasing 'Aspen' plant population and average fruit weight (lb/fruit) and number of fruit per plant. Plant population appeared to have no effect on yield (lb/ac and fruit/ac) or average fruit size (in³/fruit). There was a linear relationship between increasing 'Howden Biggie' plant population and yield (fruit/ac), average fruit weight (lb/fruit), and number of fruit per plant (Table 2). There was also a quadratic effect for plant population and yield (fruit/ac). Plant population appeared to have no effect on yield (lb/ac) or average fruit size (in³/fruit). Increasing plant population affected both cultivars by decreasing number of fruit per plant and increasing average fruit weight. Increasing plant population also affected 'Howden Biggie' by increasing yield (fruit/ac).

SWINE EFFLUENT FOR PLASTICULTURE PRODUCTION OF SWEET CORN

Kent E. Cushman and Thomas E. Horgan

ABSTRACT: Five fertilizer treatments, three of which included swine effluent, were evaluated for the plasticulture production of sweet corn. One of the treatments also included a commercial chicken litter product used as a preplant fertilizer. Four experiments were conducted at two locations: fall-prepared plots at (1) Verona and (2) Pontotoc and spring-prepared plots at (3) Verona and (4) Pontotoc. Plots were prepared in fall or spring and, if a treatment included preplant fertilizer, it was applied at that time. Results of the two experiments using spring-prepared plots are consistent with each other. There were no significant differences between any of the treatments. Analyses of leaf tissue element concentrations also confirm that there were no significant differences between any of the treatments for the spring-prepared plots. These results indicate that each of the five fertilizer approaches used in these experiments was adequate to produce high yields of sweet corn. Results of the two experiments using fall-prepared plots were not consistent. At the Verona location, treatment D produced the greatest yields while treatment A produced the least. At the Pontotoc location, treatment B produced the greatest yields while treatment D produced the least. Analyses of leaf tissue element concentrations showed significant differences between treatments for only one element, Zn, for fall-prepared plots. In conclusion, three of the four experiments showed that swine effluent produced yields equal to or greater than commercially-available inorganic fertilizers. Generally, these experiments also showed that there were few differences between type and proportion of preplant fertilizers used in each treatment. Yields were similar whether 0 to 55 % of N, P, and K was applied preplant or whether the preplant fertilizer was an inorganic product or a commercial chicken manure product.

TRIPLOID WATERMELON CULTIVAR EVALUATION: YIELD AND QUALITY

Kent E. Cushman, Rick G. Snyder, Thomas E. Horgan, David H. Nagel, and Muhammad Maqbool

ABSTRACT: Twenty entries of triploid (seedless) watermelon were evaluated in a replicated trial during the summer of 2000 at the North Mississippi Research & Extension Center in Verona. W5052, an entry from Sunseeds, produced significantly greater marketable melons (93,000 lb/ac) than any other entry. Yield of 'Millionaire,' an entry with the second highest yield (75,700 lb/ac), was not significantly different than 15 other entries. Only 'Diamond,' 'Gem-Dandy,' and Asgrow 9024 produced yields significantly lower than 'Millionaire.' W5052 also produced significantly larger melons (15.1 lb/melon) than any other entry. Average weight of 'Millionaire,' the second largest melon (14.4 lb/melon), was significantly greater than all other entries except Asgrow 9033 (13.8 lb/melon). There were no significant differences between any of the entries for number of marketable melons per acre, which ranged from a high of 6150 melons/ac for W5052 to a low of 3870 melons/ac for 'Diamond.' The lowest yielding entries, in general, were also the earliest to mature and produced the smallest melons. The highest yielding entry, W5052, was the latest to mature and produced the largest melon. Rind necrosis and hollow heart were serious problems in our study. W5052 and 'Tri-X Brand 313' had the lowest incidence of rind necrosis while RVM 8073-VP, 'Willhite 4830,' and XWT7703 had the highest. Many entries had low incidence of hollow heart, but 'Diamond,' 'Sapphire,' and 'Constitution' had the highest.

STRAWBERRY CULTIVARS 'CAMAROSA' AND 'CHANDLER' BEST IN NORTHERN MISSISSIPPI

Kent E. Cushman and Thomas E. Horgan

ABSTRACT: Strawberry cultivar evaluations have been planted at the North Mississippi Research & Extension Center since 1998. In 2000, 'Camarosa' and 'Chandler' again produced the greatest total marketable yields compared to the other entries. 'Diamante' and 'Seascape' were included for the first time in 2000, but yields were low for both of these new cultivars. Average fruit weight and percent marketable yield, however, were significantly greater for 'Diamante' compared to 'Camarosa' or 'Chandler.' 'Camarosa' and 'Chandler' were also the highest yielding cultivars in our 1999 trial. The 1999 trial did not include 'Seascape', 'Diamante', or 'Earliglow.' 'Sweet Charlie' and 'Earliglow' have performed poorly in our trials. The cultivars 'Gaviota' and 'Cardinal' were also included in this year's trial, but yields were so low that they were not included in the analysis of yield data.

MAYAPPLE: A REVIEW OF THE LITERATURE FROM A HORTICULTURAL PERSPECTIVE

Muhammad Maqbool, Kent E. Cushman, and Rita M. Moraes

ABSTRACT: A new project was established at the North Mississippi Research & Extension Center (NMREC) in Verona in 2000 to investigate field establishment of the American Mayapple (*Podophyllum peltatum*) for commercial production. This is a joint effort between the National Center for Natural Products Research (NCNPR) at the University of Mississippi and NMREC, Mississippi State University. The goal of this project is to provide research-based knowledge for the establishment of commercial mayapple plantings. Commercial plantings have the potential to provide a consistent and high quality product to the pharmaceutical industry while providing opportunities for agricultural producers of high-value specialty products. American Mayapple is a rhizomatous herbaceous perennial found in the wild throughout North America from Quebec and Minnesota to Florida and Texas. Species of the *Podophyllum* genus contain important anti-cancer compounds: podophyllotoxin, â-peltatin, and â-peltatin. A *Podophyllum* species found in India, *P. emodi* Wall. (Syn. *P. hexandrum* Royale, Berberidaceae), has been over-harvested to meet pharmaceutical industry demand and is considered an endangered species. Commercial plantings of mayapple have the potential to reduce harvest pressure on this species. In a review of the scientific literature, few references about commercial production or field establishment were found. To begin to understand mayapple as a horticultural crop, this review presents a summary of the plant's botany, climate and soils, growth and development, sexual and asexual propagation, pests and diseases, and medicinal uses. Fifty references are listed.

HORTICULTURE STUDIES – FRUITS AND NUTS

APPLE PRODUCTION STUDIES

F. B. Matta, R. C. Sloan, Jr., S. S. Harkness, and Elizabeth Montgomery

ABSTRACT: Apples have the potential to be a profitable tree fruit in North Mississippi. Questions about cultural practices such as spray programs, fertilizer requirements, fire blight control, and chemical thinning need to be addressed. Five cultivars on M7 rootstock were planted in 1997 to utilize in future cultural practice trials.

FIRE BLIGHT CONTROL IN ROYAL GALA APPLES

Frank B. Matta, Paul Thompson, and Elizabeth Montgomery

ABSTRACT: A limiting factor in apple production is fire blight bacterial disease. This study was initiated to determine the effects of applied nitrogen and calcium on susceptibility to fire blight. Various rates of nitrogen and calcium were applied on Royal Gala apple on M7A rootstock. The severity of fire blight was recorded and expressed as percentage infection per tree.

EVALUATION OF APPLE CULTIVAR/ROOTSTOCK COMBINATIONS IN NORTHERN MISSISSIPPI

Maria Sindoni, Frank B. Matta, and James O. Garner, Jr.

ABSTRACT: To increase the number of cultivar/rootstock combinations being evaluated, an orchard was planted in 1993. Plant combinations are being evaluated for over-all performance, including disease and insect resistance and postharvest physiology to determine apple storage life.

SHORTENING THE JUVENILE PERIOD OF APPLE SEEDLINGS BY GIRDLING AND GROWTH REGULATORS

Usman Siswanto and Frank B. Matta

ABSTRACT: Juvenility is inherited, and related to tree vigor and growth characteristics. This preliminary research was established to investigate the effect of girdling and the effect of gibberellic acid (GA3) and paclobutrazol on the vegetative characteristics of young apple seedlings. After 2 years observation, seedlings applied with GA3 at 1500 ppm showed vigorous growth. Trees treated with girdling and GA3 1000 ppm indicated less growth. In terms of trunk diameter growth, trees treated with the combination of girdling and GA3 at 2000 ppm resulted in bigger trees. Trees treated with paclobutrazol at 100 mg/L had smaller trunk diameter.

EVALUATION OF APPLE CULTIVARS ON DWARFING ROOTSTOCKS

Usman Siswanto and Frank B. Matta

ABSTRACT: Seven apple scion cultivars on dwarfing rootstocks were established in 1991. The study reported here was initiated to investigate the effects of various scion cultivars on dwarfing rootstocks and to determine the most appropriate scion/stock combination for Mississippi. Ultra Mac on M-7A was the least infected by fire blight (*Erwinia amylovora*) followed by Braeburn on M-26 and Mark rootstock. Jon-A-Red on MM-111, MM-106 and M-7A were the most infected by fire blight. Royal Gala on MM-111, MM-106, Empire on M-26 and Ultra Gold on MM-106 produced heavier fruits than the other scion/stock combinations. The lighter color of fruit was produced by Empire on M-26, Blushing Golden on M-7A and Ultra Gold on MM-111. Higher fruit pH was obtained for Royal Gala on all the rootstocks, and the lowest fruit pH was found on Jon-A-Red on M-7A. Jon-A-Red, Ultra Mac, and Braeburn on M-7A had higher soluble solids concentration (SSC) than the remaining scion/stock combinations.

BLUEBERRY VARIETY TRIALS

Frank Matta, Elizabeth Montgomery, Jeff Main, and Adel Al-Qurashi

ABSTRACT: The purpose of the study is to evaluate various selected blueberry varieties of rabbiteye, southern highbush, and highbush for over-all performance in Northern Mississippi.

FROST HARDY PEACH EVALUATION

R. C. Sloan, Jr. and S. S. Harkness

ABSTRACT: A major limiting factor in peach production in Mississippi is crop loss due to frosts and freezes during and after the bloom period. Seven cultivars purported to be frost hardy were planted in 1997 to evaluate production. 'Contender', 'Jayhaven', and 'Surecrop' bloomed later than 'Bobeva' and 'Ruston Red'. 'Contender', and 'Bobeva' needed more fruit thinned compared to 'Ruston Red', 'Jayhaven', 'Surecrop', and 'Harvester'. 'Bobeva' produced more fruit than 'Jayhaven' and 'Harvester' but the number of fruit was statistically the same for 'La Premier', 'Surecrop', 'Contender', and 'Ruston Red'.

PEACH FRUIT THINNING WITH PLANT HORMONES

Frank B. Matta and Paul Thompson

ABSTRACT: Peaches have a tendency to overcrop. Fruit removal is done manually. The objective of this study was to thin peaches with hormones and the insecticide Sevin to reduce the amount of annual labor required in thinning.

ETIOLATION OF PECAN SHOOTS TO ENHANCE ROOTING OF CUTTINGS

Frank B. Matta, Vicentius Tarus, and Paul Thompson

ABSTRACT: Mature wood of pecan is very difficult to root. Nurserymen would be greatly benefited if pecan trees could be propagated by cuttings. In addition, juvenility would be circumvented allowing for early production of pecans. Growers would greatly benefit from higher prices for early pecans. This study involved excluding light by using black tape wrapped on shoots taken for cuttings. The objective was to enhance rooting.

HORTICULTURE STUDIES – ORNAMENTALS

MAGNOLIA BOTANICAL GARDENS

R. C. Sloan, Jr., and S. S. Harkness

ABSTRACT: The Magnolia Botanical Gardens (MBG) project originated in discussions at the North Mississippi Research and Extension Center's Producer Advisory Meeting in the Ornamental Horticulture Commodity Group in 1996. MAFES Horticulture Unit researchers posed this question to horticulture industry representatives attending the meeting: "What research can the Horticulture Unit perform that would be the greatest benefit for the horticulture industry in Northeast Mississippi?" The group responded that a landscaped, attractive site for landscape plant evaluations would have the greatest immediate impact on the "Green Industry."

HERBICIDES FOR LANDSCAPE CONTROL OF NUTSEGE

S. S. Harkness and R. C. Sloan, Jr.

ABSTRACT: Control of purple nutsedge, *Cyperus rotundus*, in established annual beds is difficult. This trial evaluated 4 post emergence herbicides, each at 3 rates, for nutsedge control and crop injury. Lescogran 2 X exhibited the greatest damage to the vinca in 2 observation dates.

LANDSCAPE EVALUATION OF SHRUB ROSES

R. C. Sloan, Jr. and S. S. Harkness

ABSTRACT: Rugosa hybrid roses ‘Snow Owl’, ‘Yankee Lady’, and ‘Buffalo Gal’ bloomed well in April but declined in bloom number for the remainder of the growing season while ‘Lavender Dreams’, ‘Champlain’, ‘Roselina’, and ‘John Franklin’ bloomed well for the remainder of the growing season. The rugosa hybrids and ‘John Cabot’ exhibited superior disease resistance over the growing season.

LANDSCAPE PERFORMANCE OF LANDSCAPE ROSES

R. C. Sloan, Jr. and S. S. Harkness

ABSTRACT: Landscape roses planted in 1998 were evaluated for bloom, disease resistance, and vigor in the landscape. They have been grown with little fungicide spray and supplemental irrigation. There were no differences in disease resistance between the cultivars during the growing season and the disease resistance was very good. ‘Knock Out’ and ‘Carefree Delight’ rated higher in bloom performance through the growing season while vigor of the cultivars was basically the same for the 5 observation dates.

LANDSCAPE EVALUATION OF ROSES IN THE MAGNOLIA BOTANICAL GARDENS

R. C. Sloan, Jr. and S. S. Harkness

ABSTRACT: Hybrid tea (HT), English (E), floribunda (F), and antique (A) roses were planted in 1998 in the Formal Garden at the Magnolia Botanical Gardens (MBG) for evaluation of landscape performance. Bloom, disease, and vigor ratings were performed on 5 observation dates during the 2000 growing season. ‘Tournament of Roses’ and ‘Garden Party’ were very consistent blooming hybrid teas over the growing season from April to August. ‘The Fairy’ was rated high in bloom during the summer after April in the antique class and Mme Plantier was the most vigorous.

EFFECT OF SOIL AMENDMENTS IN A CLAY SOIL ON SOIL PROPERTIES AND PLANT GROWTH

R. C. Sloan, Jr. and S. S. Harkness

ABSTRACT: Strategies to improve the soil environment for plant growth would benefit property owners and landscape professionals in their attempts to establish and maintain landscape plantings. Wood byproducts are readily available in Mississippi. Bark, sawdust, or other wood byproducts used as a soil amendment may provide long term beneficial soil changes making otherwise unsuitable soils acceptable for landscape plant growth. Soil amendment treatments; pine bark, pine bark with nitrogen, and pine bark with cotton gin waste, were implemented in 10/99. Two fall crops of pansies and summer crops of vinca and crape myrtle were grown on the soil amendment beds. Pine bark with nitrogen added produced larger pansy plants during the winter growing season

TERRA-GREEN™ AS A PINE BARK AMENDMENT FOR CONTAINER NURSERY PRODUCTION

R. C. Sloan, Jr. and S. S. Harkness

ABSTRACT: Fertilizer runoff from container nurseries is an environmental and economic concern. The pine bark substrate used in containers is well drained to reduce root rot problems and to promote growth, but does not retain fertilizer very well. Terra-Green an expanded clay material was added to pine bark media to investigate the potential of Terrasorb retaining some of the fertilizer leachates. In this study, the addition of Terra-Green to the substrate did not affect plant growth. The 200 lb/yd³ rate of Terra-Green did result in higher electrical conductivity readings in the substrate leachate on 3 collection dates.

LANDSCAPE EVALUATION OF SUNFLOWER CULTIVARS

S. S. Harkness and R. C. Sloan, Jr.

ABSTRACT: Twenty five ornamental sunflower cultivars were planted at the HREU to evaluate height, flower production and landscape performance. 'Kong', 'Giganteus', and 'Mammoth Giant Russian' were among the tallest sunflowers in the trial while 'Teddy Bear', 'Sonja', 'Music Box', and 'Sundance Kid' were the shortest cultivars in the trial. 'Mammoth Giant Russian' and 'Sun Goddess' produced the largest flowers in the trial.

EFFECT OF AMISORB™ ON CONTAINER NURSERY SUBSTRATE

S. S. Harkness and R. C. Sloan, Jr.

ABSTRACT: Fertilizer runoff from container nurseries is an environmental and economic concern. The pine bark substrate used in containers is well drained to reduce root rot problems and to promote growth, but does not retain fertilizer very well. Nutrient runoff must be contained at the nursery. Also, the loss of nutrients from containers necessitates repeat applications of fertilizer, an expense for the grower. Literature suggests that the polymer thermal polyaspartate (TPA), the active ingredient in Amisorb, enhances plant growth and nutrient uptake. This trial evaluated the effect on leachate composition of pine bark nursery substrate and plant growth of Amisorb as a spray and a drench application to the root balls of 4 in liners. Amisorb had no effect on the shoot growth, stem diameter, and dry weight of *Lagerstroemia indica* 'Carolina Beauty' measured at the conclusion of the trial 9/00. Additionally, there were no differences in electrical conductivity or pH measured during the growing season.

EFFECT OF AMISORB™ ON BEDDING PLANT PRODUCTION

R. C. Sloan, Jr. and S. S. Harkness

ABSTRACT: Literature suggests that the polymer thermal polyaspartate (TPA), the active ingredient in Amisorb, enhances plant growth and nutrient uptake. This trial evaluated the growth response of 'Queen Sophia' marigold to the addition of Amisorb to liquid fertilizer commonly used in bedding plant production. 3500 ppm Amisorb added to 150 ppm N from 20-10-20 liquid fertilizer significantly increased the electrical conductivity (EC) of leachate collected 8/11/00 while no differences were detected in EC due to Amisorb addition to 300 ppm N fertilization on that date. Plant growth was reduced due to 3500 ppm Amisorb compared to 350, 35, and 0 ppm additions of Amisorb. Foliage analysis of the marigold plants showed a higher level of N, P, K and a lower level of Ca, and Mg for plants fertilized with 150 ppm N amended with 3500 ppm Amisorb.

CONTROLLED RELEASE FERTILIZER FOR CONTAINER NURSERY PRODUCTION

R. C. Sloan, Jr. and S. S. Harkness

ABSTRACT: Nursery producers want to grow ornamentals to a desired size and quality in the shortest time possible. Controlled release fertilizer (CRF) is often used to supply nutrients to plants growing in a container nursery. Sufficient fertility is required for optimum growth but excessive fertilization can injure plants, degrade watersheds, and be unnecessarily expensive to the nursery owner. This trial was conducted to evaluate the growth response of 1 gal container nursery plants for one growing season. Shoot growth of crape myrtle liners was statistically the same for 42, 36, 30, 27, and 21 grams of CRF per pot. The recommended rate is 21 grams per pot. There were no differences in shoot growth of crape myrtles grown with 30, 27, 21, 15, and 0 grams CRF per pot. In this trial, 3 and 6 grams CRF per pot produced the same amount of shoot growth as did the control plants which had 0 grams CRF applied per pot.

WILDLIFE STUDIES

GAME AND NON GAME BIRD RESPONSES TO HABITAT RESTORATION

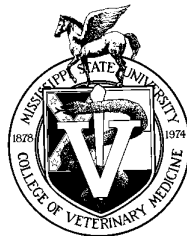
Dale H. Arner, Jeanne C. Jones, and Donald E. Pogue

ABSTRACT: Habitat restoration was initiated in 1989 on the North Mississippi Branch Experiment Station in Holly Springs, Mississippi and at the Black Belt Branch Experiment Station, Brooksville, Mississippi. Habitat areas ranged from 20 to 25 acres in size and were comprised primarily of early successional stages of vegetation, including introduced perennial grasses. Restoration techniques included native shrub planting, introduced plant control, seeding of annual legumes, cessation of mowing along forest corridors and wetlands, and protection of remnant forest stands and cavity trees. Restored areas were compared to cleaned farm areas for game bird and non game bird numbers. Significantly more game and non game species were found in the restored habitat at both sites during the study.

HABITAT RESTORATION FOR BOBWHITE QUAIL FOOD AND COVER ENHANCEMENT

Dale H. Arner, Jeanne C. Jones, and Donald E. Pogue

ABSTRACT: Partridge pea plots seeded in January either in ryegrass or on fallow bare ground resulted in equal excellent stands and canopies by June of the same year. Plots with no renovation maintained good stands through year one and two with stand reduction noted in the third year due to ryegrass dominance and/or invading weeds, primarily goldenrod. Plot renovation by disking after three years showed a resurgence of the partridge pea to an excellent stand.



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