Agronomic Crop Systems

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V(A). Planned Program (Summary)

1. Name of the Planned Program

Agronomic Crop Systems

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management	0%	0%	2%	
133	Pollution Prevention and Mitigation	0%	0%	3%	
201	Plant Genome, Genetics, and Genetic Mechanisms	12%	12%	15%	
202	Plant Genetic Resources	0%	0%	3%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	0%	12%	
204	Plant Product Quality and Utility (Preharvest)	0%	0%	3%	
205	Plant Management Systems	62%	62%	19%	
206	Basic Plant Biology	0%	0%	2%	
211	Insects, Mites, and Other Arthropods Affecting Plants	3%	3%	5%	
212	Pathogens and Nematodes Affecting Plants	16%	16%	23%	
213	Weeds Affecting Plants	0%	0%	4%	
215	Biological Control of Pests Affecting Plants	0%	0%	2%	
216	Integrated Pest Management Systems	0%	0%	7%	
601	Economics of Agricultural Production and Farm Management	7%	7%	0%	
	Total	100%	100%	100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	62.9	12.9	60.0	0.0
Actual	80.0	3.2	50.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
1076756	282541	1333306	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
3466544	141271	6939684	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
981601	37500	701604	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The Extension portion of this plan was implemented via the Innovation-Decision Process (Rogers, 1995). It is important to organize the agronomic crop systems planned program in this way because producers of various row crops, in various locations in the state are in different stages of this process for the array of research-based practices. Based on needs assessments conducted by Extension Specialists, the following practices were targeted:

•planting insect-tolerant crops •planting herbicide-tolerant crops •spaying crops with foliar fungicide to manage disease •using recommended varieties of soybeans or corn (based on UT field trial results)

A major change to this planned program was helping producers deal with the extreme weather conditions that created an unfortunate growing season. Tennessee experienced freezing temperatures in March and April combined with one of the state's worst droughts on record throughout June, July and August.

Knowledge: Newspaper articles, radio programs, websites and newsletters were used to build awareness of UT Extension resources and practices for more profitable production. Mass media highlighted pests and pesticides in a timely manner.

Persuasion: Farm visits and group meetings were used to showcase practices.

Decision: Group meetings and classes were conducted in which Extension specialists demonstrated practices and shared variety test results with producers.

Implementation: On-farm demonstrations will be conducted, particularly in the 31 West Tennessee counties, to highlight research-based practices. To the extent possible, integrated research and extension will be conducted such as result demonstrations and test plots in all 31 West Tennessee counties.

Confirmation: Farm visits and telephone calls will assist producers to continue use of the practices, respond to environmental factors, and realize greater profits.

From a research perspective, molecular, marker-assisted and traditional breeding techniques were utilized to develop genetic lines and varieties of corn, soybeans, tobacco, and wheat which are adapted, high-yielding, and disease resistant. Varieties of these crops and cotton were evaluated in replicated field research plots at numerous Research and Education Centers and with producer cooperators in selected counties. Likewise, cropping systems research addressing tillage systems and rotation schemes was conducted to develop production system information.

We conducted surveillance for exotic and invasive organisms using both conventional and molecular technology.We researched the effects of biological, cultural and chemical control technology for efficacy and effect on productivity of cropping systems under study. We sought new organisms to use in integrated control programs for pests and diseases of agronomic systems that are in danger of severe damage from new, emerging, and re-emerging pests and diseases.

Economic data was developed from field experiments on agricultural experiment stations, through surveys of producers, and through simulation modeling. Data was analyzed using standard methods for estimating yield response functions, budgeting, optimization techniques, risk analysis procedures, simulation modeling, and other methods of economic analysis, as appropriate.

2. Brief description of the target audience

The primary audience for this program was Tennessee row crop producers, and the secondary audience was the professionals, business owners/cooperatives and government officials who serve row crop producers.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	10000	15000	1000	0
2007	51885	246740	12102	246740

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	**Target**
Plan:	0
2007:	7

Patents listed
Four new Roundup Ready varieties derived from our top performing 5601T soybean variety: 1) Allen 2) 5601TRR-124 3) 5601TRR-293 4) 5601TRR-379.

Antibiotic resistance conferred by a plant ABC transporter gene when expressed in transgenic plants. Inventors: C. Neal Stewart, Jr., and Mentewab Ayalew. US SN11/912,713 filed October 26 2007.

An arsenic-specific phytosensor and uses thereof. Inventors: Jason Abercrombie, Laura L. Good, and C. Neal Stewart, Jr. US Provisional Patent applied for November 2 2007.

Herbicidal mixtures. Armel, G.R., M.S. Casini, J.C. Cotterman, E. Hidalgo, M.L. Link, P.L. Rardon, D.W. Saunders, S.D. Strachan. 2007. World Patent Application, WO07120706.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	26	36	0

V(F). State Defined Outputs

Output Target
Output #1

Output Measure
Number of exhibits displayed to promote awareness and participation in this planned program.

Year	Target	Actual
2007	5	21

Output #2

Output Measure
Number of research-based publications distributed as part of this program.

Year	Target	Actual
2007	1000	7607

Output #3

Output Measure
Presentations, workshops, media releases.

Year	Target	Actual
2007	14	0

V(G). State Defined Outcomes

O No.	Outcome Name
1	Row Crops Production: % acreage increase in conservation-till corn.
2	Row Crops Production: % acreage increase in conservation-till cotton.
3	Row Crops Production: % acreage increase in conservation-till soybeans.
4	Row Crops Production: % reduction in amount of seed planted per acre in soybean.
5	Row Crops Production: Number of acres of corn maintained or increased in conservation-tilled.
6	Row Crops Production: Number of acres of cotton maintained or increased as conservation-tilled.
7	Row Crops Production: Number of acres of soybeans maintained or increased in conservation-tilled.
8	Row Crops Production: Number of acres planted to insect or herbicide tolerant crops.
9	Row Crops Production: Number of acres of sprayed with a foliar fungicide to manage disease.
10	Row Crops Production: Number of producers using recommended varieties of soybeans or corn.
11	Additional tons of soil erosion prevented due to adopting conservation-tillage encouraged by the availability of herbicide-resistant seed for cotton production in Tennessee.
12	Additional acres of herbicide-resistant cotton in Tennessee encouraged by the adoption of conservation tillage.
13	Percentage of farmers using new IPM technology or genetics.
14	Farm operators using TAES economic research in decisions.
15	UT Extension took action to minimize affects to row crop producers from an historic drought across the state.
16	Using a fungus against soilborne pathogens
17	Biocontrol of 'wire stem' of broccoli
18	Herbicide-resistant weeds in cotton and soybean
19	Soybean improvement
20	Cotton variety improvements
21	Biotechnology impacts
22	Damping-off disease in tomatoes
23	Plant nematode resistance mechanism

Agronomic Crop Systems
Outcome #1

1. Outcome Measures

Not reporting on this Outcome for this Annual Report

2. Associated Institution Types

3a. Outcome Type:

3b. Quantitative Outcome

Year	Quantitative Target	Actual

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area

V(H). Planned Program (External Factors)

External factors which affected outcomes

Natural Disasters (drought,weather extremes,etc.)

Brief Explanation

Tennessee faced serious crop production issues in 2007 including a drought of monumental proportions and temperature extremes. Warm March weather encouraged producers to plant corn earlier than normal, and freezing conditions in April damaged over 200,000 acres of corn which had to be replanted. Exceptional drought and heat plagued the rest of the growing season. Outcomes relative to conservation tillage were not measured because programs were constantly changing to provide producers with solutions to weed, insect and disease problems.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

After Only (post program)
Retrospective (post program)
Before-After (before and after program)
Other (Third-Party)

Evaluation Results

Key Items of Evaluation