

**V(A). Planned Program (Summary)**

**Program # 6**

**1. Name of the Planned Program**

Water Management

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

| KA Code | Knowledge Area                          | %1862 Extension | %1890 Extension | %1862 Research | %1890 Research |
|---------|---|-----------------|-----------------|----------------|----------------|
| 111     | Conservation and Efficient Use of Water | 50%             |                 | 50%            |                |
| 112     | Watershed Protection and Management     | 50%             |                 | 50%            |                |
|         | <b>Total</b>                            | 100%            |                 | 100%           |                |

**V(C). Planned Program (Inputs)**

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

| Year: 2010 | Extension |      | Research |      |
|------------|-----------|------|----------|------|
|            | 1862      | 1890 | 1862     | 1890 |
| Plan       | 27.5      | 0.0  | 14.0     | 0.0  |
| Actual     | 19.0      | 0.0  | 9.6      | 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    |
| 273701              | 0              | 441132         | 0              |
| 1862 Matching       | 1890 Matching  | 1862 Matching  | 1890 Matching  |
| 273701              | 0              | 1319741        | 0              |
| 1862 All Other      | 1890 All Other | 1862 All Other | 1890 All Other |
| 1849679             | 0              | 1777526        | 0              |

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

Publish research findings generated through evaluation of best management practices to efficiently manage available water resources, to limit off-site contaminant transport from production, processing, and landscaping systems, to utilize alternative water sources and to remove contaminants from impaired/alternative water sources.

Develop and conduct research and educational programs utilizing direct and indirect educational methods to support efficient utilization and conservation of water resources, to develop alternative water supplies, to implement best management practices on agricultural production and landscapes to protect water resources from contaminants, to promote proper management of surface and ground water resources, to enhance rainwater harvesting and to remove contaminants from impaired water supplies.

The work of the AgriLife Research and AgriLife Extension is conducted jointly where research-based information is generated and then transferred to clientele.

**2. Brief description of the target audience**

Programs focusing on the issue of Water addresses target audiences including but not limited to producers, homeowners, landscape managers, industry practitioners, water resource managers, and others who identify themselves with this issue.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

| 2010          | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---------------|------------------------|--------------------------|-----------------------|-------------------------|
| <b>Plan</b>   | 12000                  | 50000                    | 4500                  | 0                       |
| <b>Actual</b> | 32844                  | 522260                   | 7947                  | 0                       |

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

**Patent Applications Submitted**

Year: 2010  
 Plan: 1  
 Actual: 1

**Patents listed**

?Aqueous Treatment System and Process Using a Hybrid Reactive Solid/Secondary Reactor?  
 application number: 61/357,466

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

| 2010 | Extension | Research | Total |
|------|-----------|----------|-------|
|      |           |          |       |

|               |   |     |     |
|---------------|---|-----|-----|
| <b>Plan</b>   | 0 | 150 |     |
| <b>Actual</b> | 0 | 199 | 199 |

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # of group educational sessions conducted.

| <b>Year</b> | <b>Target</b> | <b>Actual</b> |
|-------------|---------------|---------------|
| 2010        | 500           | 4073          |

**Output #2**

**Output Measure**

- # research-related projects.

| <b>Year</b> | <b>Target</b> | <b>Actual</b> |
|-------------|---------------|---------------|
| 2010        | 55            | 59            |

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

| O. No. | OUTCOME NAME  |
|--------|---|
| 1      | % of participants who report an increased knowledge of best management practices related to water management.   |
| 2      | % of participants who report the plan to or have adopted best management practices related to water management. |

## **Outcome #1**

### **1. Outcome Measures**

% of participants who report an increased knowledge of best management practices related to water management.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

| <b>Year</b> | <b>Quantitative Target</b> | <b>Actual</b> |
|-------------|----------------------------|---------------|
| 2010        | 65                         | 88            |

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Increased awareness and understanding of local water quality and quantity issues are critical to protect vital water resources. Knowledge of the consequences of individual actions on the quality and sustainability of water resources drives the adoption of best management practices. Training in proper selection and management of best management practices is critical to achieve local and regional water quality and water conservation goals.

#### **What has been done**

Outreach education programs have been provided to watershed stakeholders across the state. Intensive (7 to 16 hr) training programs have been implemented to empower local citizens to take leadership in protecting their water resources. Targeted training is provided for, but not limited to, watershed management, ET Networks, irrigation management, rainwater harvesting, nutrient management, chemigation, feral hog management, livestock management, pesticide management, home water use, and on-site wastewater management.

#### **Results**

Results from a series of 20 irrigation short courses targeting design, installation and operation of systems showed an average knowledge increase of 88%. Attendees at three chemigation workshops focused on proper use of fertilizers and pesticides showed an average knowledge increase of 92%. Knowledge regarding pollutant sources/BMPs and watershed function was increased for 99% of attendees at 8 workshops targeting watershed management for threatened and impaired waterbodies. Participants at 19 training events ranging from 6 to 16 hours in length demonstrated knowledge increases ranging from 75 to 94%.

### **4. Associated Knowledge Areas**

| <b>KA Code</b> | <b>Knowledge Area</b>                   |
|----------------|---|
| 111            | Conservation and Efficient Use of Water |
| 112            | Watershed Protection and Management     |

## **Outcome #2**

### **1. Outcome Measures**

% of participants who report the plan to or have adopted best management practices related to water management.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

| <b>Year</b> | <b>Quantitative Target</b> | <b>Actual</b> |
|-------------|----------------------------|---------------|
| 2010        | 25                         | 75            |

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Proper selection, installation and management of best management practices is essential to achieve water quality and water conservation goals. Extension education programs enable citizens to identify the most appropriate best management practices for their situation and provide information and training on installation and management to ensure that practices function effectively to conserve and protect water resources.

#### **What has been done**

Education and training programs have been developed and delivered to citizens and watershed stakeholders across the state. Intensive (7 to 16 hr) training programs have been implemented to empower local citizens to take leadership in protecting their water resources. Targeted training is provided for, but not limited to, watershed management, ET Networks, irrigation management, rainwater harvesting, nutrient management, chemigation, feral hog management, livestock management, pesticide management, home water use, and on-site wastewater management.

#### **Results**

80% of individuals participating in 8 intensive (7hr) watershed training programs indicated an intent to adopt best management practices to protect water resources. 70% of participants at 20 irrigation short courses reported an intent to adopt recommended irrigation management practices related to design, installation and operation of systems. 75% of attendees at three chemigation workshops indicated an intent to adopt improved fertilizer and pesticide use BMPs.

71 to 94% of participants at 19 on-site septic system training events indicated an intent to adopt recommended design, installation and management practices.

#### 4. Associated Knowledge Areas

| KA Code | Knowledge Area                          |
|---------|---|
| 111     | Conservation and Efficient Use of Water |
| 112     | Watershed Protection and Management     |

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Other (Other Program Areas)

##### Brief Explanation

Texas experienced severe drought conditions which affected program content, but had limited impact on the ability to achieve project goals and outcomes. Economic stresses also impacted program delivery efforts, however, effective planning and the use of distance education tools enabled successful implementation of programs.

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

##### 1. Evaluation Studies Planned

- Retrospective (post program)
- Case Study
- Other (Anecdotal)

#### Evaluation Results

Twenty irrigation management short courses were conducted and reached a total of 254 irrigators with training on topics including auditing, drip irrigation, weather stations, irrigation scheduling, computer aided design and smart irrigation controllers. Overall the program has a 96% overall satisfaction rate and averages an 88% increase in knowledge per course. Over 70% of the students who completed the course plan to make changes to their irrigation practices with 75% planning to benefit economically as a result of the courses. Eighty-five vineyard owners, managers and consultants representing over 800 acres of irrigated grapes attended 3 chemigation workshops. 75% of attendees planned to make changes to their irrigation practices and 81% expected to benefit economically as a result of the training. Participants on average increased their knowledge of chemigation and irrigation scheduling by 92%. Estimated water savings is approximately 800 acre-feet (260,681,142 gallons). A total of 19 on-site wastewater system training programs were conducted with gains in knowledge ranging from 60 to 100% and intent to adopt best

management practices ranging from 75 to 94%. Eight watershed stewardship training courses were conducted for over 320 participants, with pre-post and six-month delayed post survey results indicating that 80% had increased their knowledge about watersheds and water quality and 80% intended to adopt recommended practices to improve and/or protect water resources.

### **Key Items of Evaluation**

Overall, planned programs had significant impacts on citizen knowledge, understanding, and intentions to implement recommended management practices. Changes in knowledge ranged from 60 to 100% at various events, depending on pre-existing competency levels of the audience, and averaged over 80% for all non-technical audiences. Participant intent to adopt practices was highly significant, ranging from 70 to 94% across all audiences, demonstrating the high degree of program effectiveness for both technical and non-technical audiences across a wide range of water resource management and protection subject matter areas.