

Entomology

Mission:

To create and implement knowledge that improves lives.

Vision:

The Department of Entomology strives to be a network of faculty, staff, and students that creates a culture of excellence resulting in the Department being one of the pre-eminent entomological teaching, research, and extension organizations in the world.

Goal 1: Teaching - Offer academic programs that are relevant and effective in developing student's lifelong learning skills.

Program Objective: Enhancing the Educational Experience

Benchmark: Broadening educational experiences and student recruiting.

Keywords: Entomology, core curriculum, external linkages, Forensic & Investigative Sciences, undergraduate

| Strategy | Timeline/Measure | Oversight |
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| <p>1. Create an Undergraduate Certificate in Public Health Entomology as a value-added credential for career focused students with collaborations of partners in Biomedical Sciences and the School of Rural Public Health.</p> | <ul style="list-style-type: none"> • <i>Develop and implement an Academic Concentration of approximately 15 credit hours focused in Public Health Entomology building from existing courses but including a new capstone course in Disease Ecology.</i> • <i>Prepare proposal for submission to COALS academic committee (UPC) by summer 2011.</i> • <i>Implementation of Certificate target is fall 2012.</i> • <i>Background & Progress: Initial concept presentation has support from Deans of COALS, Veterinary Medicine & Integrative Biomedical Sciences, and the School of Rural Public Health. Syllabus for capstone course is under development.</i> | <p>Dr. Pete Teel and the Academic Team.</p> |
| <p>2. Complete Core Curriculum modifications as designated by THECB and TAMU.</p> | <ul style="list-style-type: none"> • <i>Participate in Core Curriculum meetings on campus, modify curricula in accordance with guidelines, and submit timely requests for approvals.</i> • <i>Timeline: Draft changes ready for review 2011 for submission in 2012.</i> | <p>Dr. Pete Teel and the Academic Team.</p> |
| <p>3. Identify and review institutions statewide that offer introductory entomology courses and assess opportunities for recruiting transfer students.</p> | <ul style="list-style-type: none"> • <i>Work through the Office of Admissions and Records to research and review.</i> • <i>Timeline: 2010-2012.</i> • <i>Background & Progress: Blinn College shares a common interest in introductory entomology courses; and Blinn has encouraged opportunities for student recruiting.</i> | <p>Dr. Pete Teel and the Academic Team.</p> |
| <p>4. Expand and support High Impact learning opportunities through</p> | <ul style="list-style-type: none"> • <i>Develop a program of student proposal submission for financial support; improve student-faculty-supervisor linkages and project</i> | <p>Drs. Ragsdale, Teel, Tomberlin, and</p> |

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| departmental support of research and internship activities. | <p><i>development and assessment.</i></p> <ul style="list-style-type: none"> • <i>Timeline: 2010-2013</i> | Advising Team. |
| 5. Seek renewal “W” and “C” designations in the Entomology and Forensic & Investigative Sciences curricula. | <ul style="list-style-type: none"> • <i>Submit renewal proposals with requested background data for “C” (communications intensive) designations for ENTO 435 and FIVS 435 Case Studies in Problem Solving and for “W” (writing intensive) designation for FIVS 481 Seminar</i> • <i>Timeline: summer-fall 2010</i> | Drs. Cecilia Tambourindeguy, Aaron Tarone, Jeff Tomberline, and Pete Teel. |
| 6. Secure Entomology course offerings for acceptance in the new University Core Curriculum | <ul style="list-style-type: none"> • <i>Potential submissions include ENTO 201, 320, 322, and a new course FIVS 123 Forensic Investigations.</i> • <i>Timeline: Prepare proposals for submission when final CC guidelines are approved – anticipated in 2010.</i> | Department Head. Faculty as Instructors of Record; academic team. |

Goal 2: Teaching - Offer academic programs that are relevant and effective in developing student's lifelong learning skills.

Program Objective: Assessing Student and Programmatic Outcomes

Benchmark: Planned methods for first cycle outcome assessment and performance trend analyses.

Keywords: Outcome assessment, student retention, recruiting, curriculum development, undergraduate, graduate.

| Strategy | Timeline/Measure | Oversight |
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| 1. Assess and improve techniques for student retention and success. | <ul style="list-style-type: none"> • <i>Academic advising team to track trends in performance outcomes of our new student orientation and retention program – Continuous annual cycle.</i> • <i>Recommend, implement and track refinements – for both undergraduate majors and graduate student cohorts – Continuous annual cycle.</i> | Drs. Ragsdale, Teel, Tomberlin and Academic Team. |
| 2. Develop recommendations to improve the Entomology Graduate curriculum. | <ul style="list-style-type: none"> • <i>Assess degree plan ENTO courses and course patterns for 64-hour and 96-hour doctoral students with assistance of An-Hoc Committee of Faculty Advisory Committee.</i> • <i>Analysis and assessment – 2012-13</i> • <i>Recommendations considered by faculty and Academic Program Review - 2013-14</i> | Drs Ragsdale, Teel, and the FAC. |
| 3. Integrate online survey tools to improve data capture procedures for student academic and professional activities, including presentations, awards, grant proposals, employment, graduate and professional school goals. | <ul style="list-style-type: none"> • <i>Develop and test Qualtrics survey tools, and evaluate optimal integration of surveys into compliance activities to increase data capture.</i> • <i>Staged development of tools 2010-2013</i> • <i>Staged implementation 2012-2014.</i> | Academic Team and Drs. Tomberlin and Teel. |

Goal 3: Research - Enhance competitiveness and prosperity of urban and rural agricultural industries.

Program Objective: Discover, develop, and implement effective, economical, and environmentally benign methods for the control of arthropod pests

Benchmark: Research and implementation of many pest management programs keep urban and rural agricultural industries competitive and prosperous. New pest threats continually challenge these industries, thus mandating continuous research on arthropod identification and life histories, discovery of new control strategies and technologies, and development and evaluation of the most effective implementation programs.

Keywords: IPM, Pest management, Arthropods, Insects

| Strategy | Timeline/Measure | Oversight |
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| <p>1. Advance discovery of novel technologies benefiting management of arthropods.</p> | <p>Provide intellectual infrastructure to address pressing arthropod management issues in Texas and elsewhere</p> <p>Progress:</p> <ul style="list-style-type: none"> • <i>Sustain scholarly activity in Fire Ant Management Research. Change the emphasis in the Texas Fire Ant Management Research Program into Invasive Ants. COMPLETED FY13.</i> <p>OUTCOME: An outside panel of reviewers was engaged, proposals were ranked and funded following the review panel recommendations.</p> <ul style="list-style-type: none"> • <i>Synergize host-insect research enterprise through key faculty interactions with off-campus faculty. Working group formed to focus on mechanisms to control sucking insects – a key functional group not currently being addressed by transgenic technologies.</i> <p>OUTCOMES TO DATE: Grants submitted, research initiated even though USDA AFRI grant was not funded and group remains engaged with grower groups in cotton and sorghum</p> <p>Planned:</p> <ul style="list-style-type: none"> • Explore opportunities in classical biological control of sorghum aphid if pest pressure continues in 2014 and beyond. • Have faculty work on collegiate strategic planning process: Grand Challenges. | <p>Department Head and Associate Department Heads</p> |
| <p>2. Build multi-disciplinary, -</p> | <p>Increase number of productive collaborations each year.</p> | <p>Department Head,</p> |

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| <p>agency, and –geographical teams to achieve sustainability across Texas and beyond.</p> | <ul style="list-style-type: none"> • <i>Work with AgriLife Research Administration to explore opportunities as they arise to collaborate with constituent groups to meet critical needs in entomological expertise.</i> <p>OUTCOMES TO DATE</p> <ol style="list-style-type: none"> 1. Creation of West Nile Virus Task Force with creation of training manual for mosquito abatement training. Five workshops planned for early 2014. 2. Regional response to invasive aphids found in sorghum, tentatively identified as <i>Melanaphis sacchari</i>. USDA grants have been submitted, 2 small grants have been awarded to faculty teams, Extension training guide developed winter 2014 <ul style="list-style-type: none"> • <i>Increase collaborations with TDA, UDSA-APHIS-PPQ, Texas Citrus Mutual, and Citrus Center in response to the January 2012 discovery of Honglongbing (citrus greening) disease of citrus in the lower Rio Grande Valley resulting in a citrus quarantine.</i> <p>OUTCOMES TO DATE</p> <ol style="list-style-type: none"> 1. Worked with industry, state and federal partners to develop a management program focused on early detection, psyllid population management and biological control. Brought funding opportunities to key faculty. Proposals have been written, outcomes yet to be determined. <p>Planned:</p> <ul style="list-style-type: none"> • Continue to work with AgriLife administration in developing an SCRI project once farm bill is passed and funding released. <p>Proposed:</p> <ul style="list-style-type: none"> • <i>Work with CEDA and NCAC015 and SAC012, Department of Entomology Administrators to work on annual salary survey data along with programmatic metrics.</i> • Support requests for major research equipment purchase to AgriLife Research administration. Planned request for microscope acquisition of ca. \$60,000 through a partnership of faculty, department and | <p>Associate Department Head for Extension, AgriLIFE Administration</p> |
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| | AgriLife Research funds. | |
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| 3. Facilitate building of translational bridges between research and implementation | Provide formalized opportunities for faculty networking between research and extension. Continuing: <ul style="list-style-type: none"> • <i>Re-evaluate the need for an Annual Entomology Science Conference</i> • <i>Expand the departmental support of a graduate student recruiting weekend</i> • <i>Re-evaluate the Extension entomology retreat. Seek Extension faculty and staff guidance on rethinking the venue and need.</i> | Department Head, Associate Department Head for Extension |

Goal 4: Research - Improve public health and well-being

Program Objective: Use model insect systems to elucidate biological systems that enable prevention and remediation of diseases that influence human health and that of their companion animals.

Benchmark: Impacts on vector-borne diseases, including malaria, dengue fever, infections by other arboviruses, schistosomiasis, trypanosomiasis, onchocerciasis, and leishmaniasis are expected to pose unknown future risks to humans and natural ecosystems due to global and local climate changes (that lead to geographical spread of the arthropod vectors and the diseases they vector) in addition to the ongoing loss of drugs and pesticides due to the selection of resistant strains of pathogens and vectors. Similar problems will exist for vector-borne diseases of plants (ex. Citrus Greening Disease, Pierce’s Disease, Tomato Spotted-Wilt Virus, etc.). Within the United States, Texas will continue to be a primary invasion point for these vector-borne diseases due to its geographical location, its climatic conditions, and high population centers.

Keywords: Vector-borne diseases, Prevention, Remediation, Arthropods, Insects, Vector-Host-Pathogen Interactions

| Strategy | Timeline/Measure | Oversight |
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| 1. Connect on campus faculty with research and extension counterparts statewide. | <ul style="list-style-type: none"> <i>West Nile Virus Task Force.</i> Led by AgriLife Extension faculty but fully engaged with relevant campus based faculty with appropriate research focus. <p>OUTCOME: Exceptional Item selected by AgriLife Research for inclusion into the FY13/FY14 Legislative Request. Exceptional Item was not funded by the 83rd Texas Legislature, but plans are to resubmit for the 84th Texas Legislative session in January 2015.</p> <ul style="list-style-type: none"> | Department Head, Faculty, AgriLife Administration |
| 2. Sustain momentum in the Forensic and Investigative Sciences major | <p>Seek novel means to fund the nationally accredited program.</p> <ul style="list-style-type: none"> <i>DIFFERENTIAL TUITION.</i> Developed a proposal that was presented to the Provost. <p>OUTCOME: One-time funding of \$57,000 for FY14 was obtained to support FIVS program. One full-time lecturer was hired to help relieve the teaching load.</p> <ul style="list-style-type: none"> REDESIGN FIVS curriculum to meet the new FEPAC standards <p>OUTCOME: Report submitted to FEPAC, report was accepted without comment by FEPAC and at the American Academy of</p> | <p>Department Head, Faculty, AgriLife Administration; Development Foundation</p> <p>FIVS Director, Kevin Heinz and Associate Director Pete Teel.</p> |

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| | <p>Forensic Sciences annual meeting with the Directors of accredited programs, all modifications were accepted as meeting the new standards.</p> <ul style="list-style-type: none"> • Developed working partnership with Tom Shehan regarding teaching support Forensic and Investigative Sciences Program through required course taught by TEEX instructors in Crime Scene Investigation (FIVS 422). <p>OUTCOME: completed.</p> <ul style="list-style-type: none"> • <i>Initiate development of a fund raising campaign to support the program. Initiation of the Forensics and Investigative Sciences Endowment. Current book value of \$8,200</i> <p>Goal not met. Focus has been for fund raising for the \$4.2M Urban and Structural Entomology building which broke ground Fall 2013 for completion by November 2014</p> <p>Proposed:</p> <ul style="list-style-type: none"> • <i>Mentor new hire in Apiculture.</i> • <i>Support development of FIVS 123 Forensic Investigations, an online only course to be developed by TEEX.</i> | |
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Goal 5: Research – Successfully recruit, retain, and promote faculty; increase overall budgets, and improve infrastructure to sustain international reputation and fulfill Department mission and vision

Program Objective: Strengthen existing and build new programs of discovery, transitional, and applied entomological research from levels of ecological landscapes to biological molecules to provide educational, scientific and technological advances through teaching, research, and extension and regulatory.

Benchmark: Entomological opportunities continue to expand and TAMU Entomology is geographically and scientifically well-positioned for sustained international prominence. There are currently 22 tenured and tenure-track faculty and one clinical faculty member (non-tenure track) based in College Station who are the scholarly engines to achieving this goal. I have reported here for comparison purposes the grantsmanship of the extension entomology unit because in nearly all of our peer institutions, these faculty would also hold tenure and their scholarship would be counted in their departmental total.

Keywords: Discovery Research, Translational Research, Invasion Biology, Vector Biology, Biodiversity, Public Health, Interaction, Insect-Host, Insect-Pathogen, Insect-Insect, Insect-Environment

| Strategy | Timeline/Measure | Oversight |
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| 1. Build upon existing research strengths in using insects as model systems. | Fill faculty vacancies in key areas including the Endowed Chair in Agricultural Biotechnology and a second Endowed Chair in Urban and Structural Entomology. <ul style="list-style-type: none"> • <i>Attempts to recruit Mike Roe and Subba Reddy Palli failed for the Agricultural and Biotechnology Endowed Chair position</i> • <i>Negotiations are currently underway for Dr. Gold's replacement in Urban and Structural Entomology.</i> • <i>Initiated recruitment of assistant professor in arthropod systematics and biodiversity. Search committee appointed, applicants being screened, interviews planned for early 2014.</i> • <i><u>URGENT NEED:</u> Conversion of Clinical Assistant Professor (G. Hamer) to a TT faculty position needed by January 2015 when his current partner placement program hire terminates.</i> • <i>Work with AgriLife Extension to create a new Urban and Structural Entomology Extension Specialist position based in College Station. Approval gained, search committee appointed for a search in 2014.</i> | Department Head, Resident Director, AgriLife Administration |

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| | <ul style="list-style-type: none"> • Complete search for an Extension Specialist and Assistant Professor in Agricultural Entomology for Corpus Christi • Completed: Extension Specialist and Assistant Professor in Cotton Entomology located in Lubbock, TX. Offer made to Kelly Tilmon, but partner placement was not available. Re-opened search and in second round made offer to Dr. Apurba Barman who accepted the position. 100% AgriLife Extension | |
| 2. Diversify faculty to open international corridors | <p>Increase diversity of culture, gender, and perspective among the faculty whereby it best reflects the composition of the Texas population.</p> <ul style="list-style-type: none"> • New Assistant Professor in Apiculture, Dr. Juliana Rangel is female and Hispanic bringing our total women faculty to 5 of 22 T/TT faculty (22.7%) at College Station. • New Assistant Professor in Extension Entomology (Cotton, Lubbock, TX) is Dr. Apurba Barman. • The department continues to implement gender diversity recruiting strategies for each faculty search. Three faculty searches underway and 2 Endowed Chairs. | Department Head |
| 3. Work to better balance workloads and reward structure. | <p>Rebalance faculty average appoints to 33% Teaching and 67% Research – and better align research interests to teaching responsibilities.</p> <ul style="list-style-type: none"> • Hired lecturers to provide relief for key faculty who are teaching well above their job expectations. • Retained two faculty and DH is working on a third preventative retention offer. • Sought equity salary increases for faculty identified by COALS administration as needing an adjustment. | Department Head, Faculty, AgriLife Administration |
| 4. Increase faculty contribution to the scientific enterprise. | <p>Increase scientific outputs in terms of peer-review publications (5% for the year, pending faculty replacements), the quality of these publications, and the impacts of the scientific activity.</p> <ul style="list-style-type: none"> • Total peer reviewed publications per faculty member was 4.1. • Impact factor of all papers averaged 2.95 up from 1.2 in 2007. • Faculty have submitted 3 disclosures of intellectual property. | Department Head, Faculty |

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| <p>5. Improve fiscal support for research programs.</p> | <p>Increase grants and contracts by 5% per year (compare FY12 to FY13)</p> <ul style="list-style-type: none"> • <i>In FY13, a total of 109 proposals were submitted an 18% increase over FY12.</i> • <i>Of the 109 proposals, TAMU faculty submitted 67 (\$10.02) and the Extension Entomology unit submitted 42 (\$2.03).</i> • <i>In FY13, 19 of the 67 TAMU proposals were funded (28%) and 15 different PIs received an award for a total of \$2.14 million compared to 14 PIs in FY12 totaling \$3.15million.</i> • <i>The Extension Entomology unit in FY13 received 20 awards compared to 35 awards in FY12.</i> • <i>Entomology ranked 3rd in 2012 and 6th in 2013 in grants received out of 14 COALs Departments.</i> • <i>Texas A&M Endowment contributions and commitments of \$3.3M has allowed us to begin construction of the Rollins Urban and Structural Entomology facility</i> • <i>Distance delivery differential tuition has increased from \$3.7K in FY12 to \$96.3K in FY13 and an estimated \$200K in FY14.</i> <p><u>Additional Proposals:</u></p> <ul style="list-style-type: none"> • <i>Request funding support from AgriLife Research to purchase a multi-user Leica M205FA stereo microscope with \$20K coming from each of 3 sources (faculty, department and AgriLife Research). Expected outcome is to increase capacity for graduate student training in systematics, neurobiology, and physiology.</i> | <p>Department Head, Faculty</p> |
| <p>6. Improve Department Infrastructure</p> | <p>Create space sufficient for faculty to conduct internationally prominent research.</p> <p>Progress:</p> <ul style="list-style-type: none"> • <i>Initiate renovation of laboratory space on 3rd floor for Agricultural Biotechnology Endowed Chair. Begin to demolish and leave as shell space.</i> • <i>Continued fundraising for Urban and Structural Entomology building so that equipment and shelled spaces can be completed.</i> • <i>Initiated reassignment of greenhouse space to Dr. Greg Sword with renovation underway.</i> | <p>Department Head, AgriLife Administration</p> |

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| | <ul style="list-style-type: none">• <i>Partnered with Parking and Transportation Services to remove the WWII Quonset building</i>• <i>Fundraising for Rollins' Urban and Structural Entomology facility was secured at a level so that a construction contract was awarded and the contractor broke ground in January 2014. We expect to occupy the facility in November 2014.</i>• <i>Completed installation of 20, 48-drawer insect cabinets on the 2nd floor hallway to expand the TAMUIC. This is only a temporary solution as the floor load cannot handle additional cabinets in the TAMUIC assigned space.</i>• <u>Additional Proposals for future consideration:</u>• <i>Seek funding for improvements of the federally licensed quarantine space in the Biological Control building assigned to Entomology. Need to add modular greenhouses, BSL3-Ag, to support research on exotic vectors of plant pathogens.</i> | |
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Goal 6: Regulatory

Program Objective: Increase relevance and capacity of Texas Apiary Inspection Service (TAIS) to execute its regulatory functions.

Benchmark: TAIS has statewide responsibility to maintain a healthy and viable population of honey bees to benefit pollination needs, honey production and Texas Agriculture as a whole.

Keywords: honey bees, bee keeping, apiary, regulatory

| Strategy | Timeline/Measure | Oversight |
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| 1. Redesign the TAIS staffing plan | Constituted a review of all activities of the TAIS when current Director was on extended leave <ul style="list-style-type: none"> • <i>Formed advisory committee and held first meeting.</i> • <i>Advisory Committee reviewed TAIS staffing plan upon retirement of Director and one off-campus inspector</i> • <i>AgriLife Research approved a search for a new director which was completed and Mr. Mark Dykes has been hired and will start March, 2014.</i> • <i>Advisory Committee will be used by Mr. Dykes as the new Director will seek their opinion as he restructures TAIS to meet the industry needs</i> | Department Head, Faculty involved in Apiculture Research |
| 2. Enhance external communication avenues to clientele. | <ul style="list-style-type: none"> • <i>Key role of new Chief Apiary Inspector</i> | Department Head. Chief Apiary Inspector. Apiculture faculty |
| 3. Seek stability in funding for TAIS. | <p><u>Proposed:</u></p> <ul style="list-style-type: none"> • <i>Work in tandem with the Advisory Committee to resolve fee structure and use of fees by TAIS</i> | Department Head. /AgriLife Administration. State Apiary Inspector |

Goal 7: Integration

Program Objective: Increase and stabilize revenue sources for Texas IPM Program.

Benchmark: The move to competitive Federal funding destabilized a highly successful applied research and extension outreach program.

Keywords: IPM, fiscal

| Strategy | Timeline/Measure | Oversight |
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| 1. Initiate capital campaign for “IPM Enhancement Fund in Entomology” | Initiate gift agreement and funding strategy. <u>Proposed, not yet begun activity:</u> <ul style="list-style-type: none">• <i>Goal is initially to fund several IPM internship positions with industry or private gifts. Need is \$5K/student per summer</i>• <i>Begin to meet with prospects in coming year</i> | Associate Department Head for Extension & IPM Coordinator with assistance from the Department Head and the Texas A&M Foundation |

PROGRAMMATIC GOALS AND OBJECTIVES

AGRICULTURE – FOOD, FIBER, AND GREEN INDUSTRIES

Imperative 1: Texas agricultural producers effectively evaluate and adopt research-based technology applications and best management practices for crop and forage systems to enhance their economic competitiveness in the global marketplace.

Goal 1: Producers improve their knowledge of agricultural production systems to improve profitability and conserve resources.

| Strategy | Timeline/Measure(s) | Oversight | Comments/Notes | Measure Met |
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| Provide science-based, multidisciplinary programs to producers and associated agribusiness professionals relative to technology transfer in crop and forage systems. | 2014-2018: Producers increase knowledge and/or utilize best management practices for crop and forage systems. This includes soil testing, weed identification, Integrated Pest Management practices and tools, plant disease identification and management, management of conventional and reduced tillage systems, improved crop and forage genetics. (OUTCOME) | T Miller | | YES |
| | | C Allen C Sansone D Appel | | NO |
| Results/Narrative | | | | |
| Strategy | Timeline/Measure(s) | Oversight | Comments/Notes | Measure Met |
| Provide science-based, multidisciplinary programs to producers and associated agribusiness professionals relative to technology transfer in crop and forage systems. | 2014-2018: Producer adoption of IPM compatible tools to manage weeds, insects, and diseases will increase. (OUTCOME) | C Allen | | YES |
| | | C Sansone D Appel | | NO |
| Results/Narrative | | | | |

Goal 3: Encourage adoption of pesticide safety for pest- and pesticide-sensitive institutions, including schools, child care facilities, hospitals, nursing care facilities, and others.

| Strategy | Timeline/Measure(s) | Oversight | Comments/Notes | Measure Met |
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| Conduct annual mandatory and advanced IPM regional trainings for school IPM coordinators and other school IPM stakeholders. | 2014-2018: Knowledge and implementation of IPM concepts measured by exam and follow-up surveys, with knowledge gain of 5%. (OUTCOME) | C Allen M Merchant D Rennie | | YES NO |
| Results/Narrative | | | | |
| Strategy | Timeline/Measure(s) | Oversight | Comments/Notes | Measure Met |
| Maintain regular communication with school IPM facility managers, school IPM stakeholders, and interested agencies via newsletters, email, and letters. | 2014-2018: At least 50% of all school districts annually reached via periodic electronic or print materials. (OUTPUT) | C Allen M Merchant D Rennie | | YES NO |
| Results/Narrative | | | | |
| Strategy | Timeline/Measure(s) | Oversight | Comments/Notes | Measure Met |
| Develop IPM techniques and innovative training materials for institutions wanting to improve pest control while minimizing risks for employees and clientele for onsite visits. | 2014-2018: 5% percent increase in understanding or adoption of key IPM concepts/measures achieved among institutional decision-makers. (OUTCOME) | C Allen M Merchant D Rennie | | YES NO |
| Results/Narrative | | | | |

Goal 4: Increase urban pest control and safety education among urban pesticide applicators, including those who provide pest control for structures, turfgrass, and landscapes.

| Strategy | Timeline/Measure(s) | Oversight | Comments/Notes | Measure Met |
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| Conduct regular, Extension-sponsored pest management training programs for structural and landscape pesticide applicators. | 2014-2018: Existing pest management workshops for urban pesticide applicators conducted and quality maintained, as measured by meeting attendance and post-program evaluations. Knowledge and skills increase by 15%. (OUTCOME) | D Rennie C Sansone D Appel | | YES NO |
| Results/Narrative | | | | |
| Strategy | Timeline/Measure(s) | Oversight | Comments/Notes | Measure Met |
| Minimize the economic and environmental costs of urban pest control for Texans. | 2014-2018: Measurable reductions achieved in costs or environmental risks associated with urban pest management practices. Case study to be conducted will reveal reduced costs of 10%. (OUTCOME) | C Sansone C Allen D Rennie | | YES NO |
| Results/Narrative | | | | |