<u>Example</u>:

Extension IPM-Coordination and Support (EIPM-CS) Program

Coordination Application

Note: these examples are excerpted from 2008 proposals. The criteria are slightly different, particularly in that collaboration is not a separate section, but may relates at any point in the proposal.

PROJECT SUMMARY

Instructions:
The summary is limited to 250 words. The names and affiliated organizations of all Project Directors/Principal Investigators (PD/PI) should be listed in addition to the title of the project. The summary should be a self-contained, specific description of the activity to be undertaken and should focus on: overall project goal(s) and supporting objectives; plans to accomplish project goal(s); and relevance of the project to the goals of the program. The importance of a concise, informative Project Summary cannot be overemphasized.

Title: Delivering IPM

PD:	**Institution:**
CO-PD:	**Institution:**
CO-PD:	**Institution:**
CO-PD:	**Institution:**
CO-PD:	**Institution:**
CO-PD:	**Institution:**
CO-PD:	**Institution:**

EIPM-CS Proposal Type: Coordination

The goal of the Integrated Pest Management (IPM) Program is to increase agricultural profitability while minimizing environmental effects associated with pest management practices while growing safe food and feed. To achieve this goal, we plan to continue to deliver our high quality and targeted IPM programs to stakeholders in the areas of agronomic field crops and the high value crops of processing vegetables, fresh market vegetables, and nursery plants. Specific program objectives are to provide IPM coordination, IPM collaboration, and program emphasis in the areas of IPM in agronomic crops and IPM in high value crops. We plan to accomplish these objectives by employing an experienced IPM coordinator to organize stakeholder input and manage IPM relationships. We will continue to collaborate explicitly with and Crop Production Association to deliver educational programs. We will develop and deliver educational programs in concert with other targeted stakeholder groups of corn, soybean, processing vegetable, fresh market vegetable, potato, cranberry, and nursery growers. Educational programs will include scout, grower, and consultant training in identification, IPM practices, and diagnostic skills. Need based educational materials which support IPM practices will be developed and delivered to our audience. We will evaluate the effectiveness of our programming by using qualitative and quantitative measures of impact. Through these activities, stakeholders will have greater knowledge and skills and will adopt and implement IPM practices at a greater frequency.

This file MUST be converted to PDF prior to attachment in the electronic application package.

Delivering IPM

Introduction

The University of IPM Program has an established infrastructure consisting of highly qualified and experienced staff, who team with IPM faculty colleagues to deliver effective IPM educational programs. Programming is guided by engaged stakeholders and partnering organizations and endorsed by Extension Dean (see Appendix letter, p. 1). If funded, we will support an IPM coordinator, support IPM collaborations within , and emphasize IPM training in the areas of Agronomic Crops and High Value Crops.

Program Staff and Affiliated Personnel

Project Director

IPM Program Coordinator

Administrative Contacts:

Key IPM Personnel:

IPM Steering Committee Members: (also includes , and)

University of IPM Program Goal. The goal of the Integrated Pest Management (IPM) Program is to increase agricultural profitability while minimizing environmental effects associated with pest management practices and growing safe food and feed, which is in concert with the National Roadmap for IPM (USDA 2004).

Stakeholder Engagement. Cropping systems in re highly diverse and range from traditional agronomic crops like corn and soybean to high value crops like potatoes, , and fresh market vegetables. To gain input on the needs from this diverse stakeholder audience in order to fulfill our IPM goal, the IPM Program receives biannual stakeholder input from various sources, most notably our 20-year Integrated Pest and Crop Management (IPCM) Technical Advisory Committee comprised of 20 growers, crop advisors, field representatives, industry group representatives, and state and federal agency personnel (see Appendix letters , p. 2-5). Additional input has been received from agronomic field crop stakeholders through a Extension Needs Assessment Workshop in March 2008, annual research and extension planning sessions with potato, soybean, and growers and personal communication with growers and crop advisors. Their input has been instrumental in developing our existing IPM Program and continues to guide our plan that includes responses to these essential and critical needs.

IPM needs prioritized in Three over-arching needs have been identified for the IPM Program to continue to service the needs of many IPM stakeholders.

- Core IPM Knowledge. Growers and consultants need to learn the fundamental, cross-disciplinary IPM knowledge and skills in order to implement IPM practices. These core skills include pest identification, crop staging, scouting techniques, and general management practices. Some information is applicable to more than one cropping system (i.e. agronomic and vegetable crops). However, growers and consultants in several cropping systems need customized training. To achieve these trainings, educational programs for scouts, growers, and consultants that utilize classroom training, in-field, hands-on training, field days and demonstration plots will be delivered by the IPM Program.

- Advanced IPM Knowledge. Growers and consultants need crop-specific IPM information to implement daily pest management decisions. A few current examples of needed management information include information on western bean cutworm, foliar fungicide use on corn, insect management in cucurbits, and weed management and reduced reliance on organophosphate insecticides in cranberries. The IPM Program has the capacity and experience to use multiple delivery mechanisms and partners with Extension faculty to transfer research-based IPM information to our diverse audiences. Unique and efficient examples of delivery mechanisms include the use of webinars to efficiently disseminate timely pest management information to multiple locations, the development and delivery of IPM guides and educational materials designed for growers and crop advisors, and the planned development of a training video library, which can be used to train growers, crop advisors and other student groups that include high school and technical colleges.

- Efficient IPM Programming. Cost effective and safe pest management is essential to the profitable production for all of the diverse crops grown in . Because resources to provide IPM education are limited, it is critical to maximize the efficiency of personnel and resource use through coordination and collaboration. The IPM Program coordinates IPM activities by providing leadership with industry groups including Integrated Pest and Crop Management Technical Advisory Committee, Association of Professional Agricultural Consultants, and Certified Crop Advisors to advance IPM educational opportunities in . The IPM Program also collaborates with other campuses to teach IPM scout training classes and other training programs.

Stakeholder input will continue to be used on a regular basis to determine effectiveness of existing programs and to prioritize future programming needs. To ensure that this happens on a formal basis, the IPCM Technical Advisory Committee meets twice per year to discuss IPM programming efforts. Additionally, various informal processes will be used to collect input, which includes representation on industry and grower boards and through personal communications with stakeholders.

A Tradition of IPM Program Success. The IPM program has a 29 year history of effective and efficient programming that has developed research-based scouting programs, educational activities and IPM decision making tools for 's agronomic and high value crops. One example is the award winning decision software for pest management (et al. 1994). These program activities were possible only through close collaborations with growers, industry representatives, and -Extension and IPM staff. Pilot IPM scouting programs were developed for corn, alfalfa, soybean, wheat, sweet corn, potatoes, snap beans, onions, carrots, cabbage, mint, turf, , Christmas trees and woody ornamental nursery stock. IPM Program staff and Extension faculty took the lead in development of scouting methods and coordinated acreage signup with growers. Field scouts were trained and managed by IPM Program staff. Private industry and growers were involved in the early planning stages to ensure a seamless transition of the IPM scouting programs to the private sector. These scouting programs indirectly led to the development of the Association of Professional Agricultural Consultants, who continues to service

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growers, have a continued need for trained scouts, and need new IPM information for changing circumstances.

A natural extension of the pilot IPM crop scouting programs was a series of education programs designed to keep growers and crop consultants updated with the newest developments in IPM research and recommendations. This educational component is now the primary focus of the IPM Program and has been requested by stakeholders (see Appendix letters, , p. 2-11). Long standing educational programs include, but are not limited to:

- IPM Scout Training Class. A one credit course coordinated by and taught collaboratively by , and faculty from College. Over 2,000 students have been trained in the past 26 years. Students are employed by independent crop consultants and enter the agricultural industry.
- Crop Diagnostic Training. This 12-year program is coordinated by and provides in-field, hands-on training designed to increase IPM knowledge and skills of ag-professionals. Over 4,000 crop advisors have been trained to date. Participant evaluations and ratings indicate that this is one of the best training sessions offered by Extension.
- Certified Applicator Training Program. This 3-year program is coordinated by along with the and Crop Production Association and provides new commercial applicators with behind-the-wheel training on proper driving and application techniques to avoid spills, drift, and other misapplications while making effective pesticide applications.
- Certified Crop Advisor (CCA) Pre-Test Training. This 16-year old course is coordinated by and designed to train individuals on CCA performance objectives. Pest management is a significant portion of the CCA program. Over 700 participants have been trained through this program and 615 active CCAs in continue to receive IPM training annually.
- Newsletter. This weekly newsletter transitioned to web delivery in 2006 and is managed by It is the principle delivery mechanism that IPM faculty use to communicate pest management recommendations during the growing season to consultants and growers. Other IPM management information is communicated through specific print media as needed.

The IPM Program is also involved with several other educational programs either in an advisory/coordination role or as speakers. IPM program involvement is also expected by these groups which include Extension county staff, Association of Professional Agricultural Consultants, Soybean Association Corn Growers Association, Crop Production Association, Natural Resources Conservation Service, Growers Association, Food Processors Association, Fresh Market Fruit and Vegetable Growers Association, and State Growers Association.

The IPM Steering Committee Technical Advisory Committee, and planning process maintain a high level of communication, which results in a complete avoidance of duplication of effort within and among institutions and organizations in This is enhanced by the long history and standing of the IPM Program in Beyond the IPM Steering Committee, other Extension and research faculty are also familiar with IPM staff because of our program planning process and they seek and receive support for IPM projects in a coordinated manner. Growers and industry personnel have been collaborating with IPM staff for 29 years and are familiar with our names and expertise. IPM Program staff are also involved with coordination of several grower and industry associations.

Focus Areas for IPM Plans. To achieve the IPM goals for , the IPM Program will request program support in four areas 1) IPM Coordination, 2) IPM Collaboration, 3) IPM in Agronomic Crops, and 4) IPM in High Value Crops. The decision to focus on these areas is based on critical needs identified by stakeholders as well as a desire to avoid duplication of effort. The IPM program will not seek funding in the following emphasis areas, which have a given level of existing programming.

IPM Emphasis Areas with Existing Programming in

- IPM Coordination within Conservation Partnerships. faculty and staff are currently providing support to NRCS for the IPM basic and advanced training needs related to the pest management standard (595) which is needed by crop consultants and NRCS staff.
- IPM Support for Pest Diagnostic Facilities. The has an existing Insect Diagnostic Laboratory, a Plant Disease Diagnostic Clinic, and a Turfgrass Diagnostic Clinic, which are currently funded by Extension and nominal user fees.
- IPM in Schools. IPM programs in schools are currently a joint programming effort between the Department of Agriculture, Trade and Consumer Protection and Extension faculty.
- IPM in Housing and IPM for Pests of Human and Vectors of Diseases. Programming in both of these areas is a current area of emphasis of the Extension Insect Diagnostic Laboratory and Department of Entomology.

- IPM Partnership in Wide Area Pest Monitoring and Reporting Systems. Although funds were not specifically requested for this emphasis area, the IPM Program will be prepared to assist with coordination efforts if needs dictate. For example, is designated as a state and is unlikely to receive USDA or Research Program

Focus Area 1. IPM Coordination

Rationale for IPM Coordination. The IPM Program's educational emphasis is to provide IPM skills, practices, and training for producers and crop advisors as identified through stakeholder input. These educational programs are also designed with the goals of the IPM National Road Map in mind, which emphasize profitable IPM practices reducing impact on the environment while protecting human health Extension faculty have the desire to engage in stakeholder IPM needs, but often are limited in their ability to plan and deliver IPM training programs and respond to requests for other data queries. The IPM Program provides the infrastructure to more effectively respond to these needs through the coordination provided by , our current IPM Coordinator. As a consequence, we believe our existing interdisciplinary and comprehensive approach effectively responds to the IPM needs of and mirrors the strength of the Cooperative Extension Service's faculty and staff. will continue to serve as the IPM Coordinator and will be responsible for all aspects of this grant application along with Project Director.

IPM Coordinator's duties will include, but are not restricted to the proposed activities. It should be noted that this position is designed to coordinate statewide IPM activities within the -Extension campus and with stakeholder groups, including government and commodity organizations. Although duties defined in this proposal are considered important, flexibility will be built into this position to respond to the changing nature and demands of IPM in the state of . (See Focus Area 1 Logic Model, p. 18).

IPM Coordination – Activities and Outcomes.

1. Planning and Coordination of Extension IPM Outreach. IPM planning and coordination will be achieved by the IPM Program's continued involvement in several committee activities. The most notable is the Integrated Pest and Crop Management Technical Advisory Committee. This long standing committee has provided external oversight for the IPM Program by assessing their current agricultural situation and ultimately providing helpful input that is used to formulate solutions. Committee membership is comprised of growers, crop advisors and representatives from agricultural organizations that include the Association of Professional Agricultural Consultants (see Appendix p. 2), Crop Production Association (see Appendix, p. 3), Food Processors Association (see Appendix, , p. 4), Corn Growers Association (see Appendix, , P. 5), and Vegetable Growers Association (see Appendix p. 10), as well as representatives from governmental partners at the Department of Agriculture, Trade and Consumer Protection, Department of Natural Resources and the Natural Resources Conservation Service. Faculty representatives from the College of Agricultural are also invited to listen and assist with the discussion. This committee meets twice each year and has been extremely helpful in identifying emerging pest management challenges and providing input to the IPM Program.

The IPM program also provides statewide coordination of IPM activities through the campus-based IPM Steering Committee which is comprised of eight faculty and staff from pest management disciplines within College of Agricultur Committee members provide internal insight for the IPM Program staff and are an excellent compliment to the external oversight provided by the Integrated Pest and Crop Management

Technical Advisory Committee. This committee also provides a safe guard to avoid duplication of efforts among [redacted] faculty and staff because of their diverse appointments from the Agronomy, Horticulture, Entomology, and Plant Pathology Departments of the [redacted] College of Agricultur[redacted]

Currently, the [redacted] IPM Program is represented on several of [redacted] Extension's self-directed teams (i.e., Grains, Forage, and Vegetable). This representation allows the [redacted] IPM Program staff to maintain an active connection with the extension programming efforts of campus and county-based staff, an opportunity to leverage IPM programming, and serves as another safeguard to program duplication. These interactions lead to a more comprehensive crop management approach that includes IPM within crop and nutrient management.

2. Responding to IPM Related Inquiries from the EPA and Other Regulatory Organizations. The [redacted] IPM Program will continue to respond to all IPM related inquiries from the EPA and other regulatory organizations in an effort to provide accurate and detailed pesticide use and management information (see Appendix [redacted] IPM Center, p.12). The [redacted] IPM Program understands the value of providing regulatory agencies with an accurate representation of pest problems as well as pesticide use patterns in [redacted]. We are aware that this information is an essential component used in making informed decisions. The [redacted] IPM Program also understands this information is equally important to [redacted] diverse and high value agricultural industry to make sure their needs are represented. In the past, the [redacted] IPM coordinator has either directly answered these requests or routed requests to faculty/staff responsible for that cropping system and/or pest problem. Additionally, requests have been sent to industry and grower representatives in an effort to gather data, insight, and to keep these individuals or organizations involved with the decision making process.

3. Coordinating and Reporting on State/Institutional Activities across Disciplinary Boundaries. The [redacted] IPM Program is an integrated program with representation and substantial activities across the weed science, entomology, and plant pathology disciplines. The [redacted] IPM Program will continue to attend, participate, and report to the regional [redacted] committee. We understand the need to coordinate activities across state lines because it avoids duplication of effort. This networking is also important because it also allows for exchange of ideas, access of resources, and can lead to better IPM programming efforts within the region and the state of [redacted] The IPM Coordinator has reported [redacted] IPM successes within the National IPM Reporting system and will fulfill the reporting requirements of this program.

4. Participation in Networking Activities on the State and Regional Level. The [redacted] IPM Program has been actively involved with and will continue to be involved in networking roles which allow [redacted] IPM Program staff to be involved in the planning process as well as access to stakeholder input. Some of the current networking activities include these roles.

- [redacted] has leadership roles on the Executive Board of the [redacted] Association of Profession Agricultural Consultants and membership on several committees. This organization is the voice of the independent agricultural consultants within [redacted] Membership includes crop consultants, livestock and dairy nutritionists and agricultural financial planners. Together, this unique and diverse set of agricultural consultants provides a forum for education activities which the [redacted] IPM program has assisted with and will continue

to do so. It also provides an exceptional chance to gain input and direction for IPM programming activities in

- has a leadership role for the International Certified Crop Advisors (ICCA) program as a local board member serving as a representative of Extension. This is an excellent opportunity to provide contributions to the ICCA program as well as to gain input on the needs of state CCAs in terms of membership services and programmatic needs.
- is a co-chair and member in the Extension Self Directed Grains Team. This 2-year leadership role and on-going team membership has been important because of the networking activities among Extension state and county faculty and staff. It provides a safeguard against duplication of effort, but also allows for an organized forum for exchange of ideas and a method for quick and prompt solutions to state and local IPM problems.

IPM Coordination – Evaluation and Pitfalls. The success of IPM coordination activities will be primarily based on qualitative indicators. Although quantitative outcomes such as the number of programs coordinated, number of advisory committees held or board meetings attended, number of responses to EPA data requests, and federal reports submitted will be documented, the overall value and direction of the IPM Program will be assessed based on feedback from the Technical Advisory Committee. The current IPM coordinator has 28 years of experience in and is a trusted partner with stakeholders. The greatest pitfall for IPM coordination in would be the unexpected loss of this leadership. Extension fully supports this activity, stakeholders are highly supportive, and facilities also exist to fully support this program.

Focus Area 2. IPM Collaboration

IPM Collaborations. Collaborations provide the distinct advantage in providing cost effective programming and minimizing duplication of efforts. The IPM Program's two major collaborative projects in 2009 will be 1) IPM Field Scout Training Classes and 2) Custom Applicator Program. Both projects are part of the IPM Program's core programming emphasis and since they apply to numerous crops and pests, do not suitably fit within any specific area of program emphasis. Although multiple collaborators are identified for each project, funds are only requested for the IPM Program, which has the major coordination and leadership role for each project. (See Focus Area 2 Logic Model, p. 18).

Rationale for IPM Field Scout Training Classes. Proper IPM recommendations start with a thorough understanding of the pest and cropping system. This knowledge includes proper pest identification, basic understanding of pest life history, thresholds, crop growth and development and soil and plant tissue testing techniques, etc. Without this information, an intelligent recommendation cannot be prepared. This is the foundation for the development and continuation of the IPM Field Scout Training Classes.

Field Scout Training Classes - Activities and Output. A Field Scout Training Class was first developed by the IPM Program as an extension-based educational program in 1982 and formal course arrangements were expanded with and with collaborations with to meet demand for field scouts. Each class is offered for one credit and is also open to non-degree students. Campus faculty, IPM Staff, and Extension faculty are used as instructors. Program focus is on pest identification, damage symptoms, life cycle and scouting techniques and other necessary information for

students to monitor corn, soybean, wheat and alfalfa. IPM staff coordinate production of the IPM Scout Manual, which students purchase, and quizzes and exams. In the coming year, we anticipate enrollment of 35 students at [redacted] 20 students at [redacted] and 25 students at [redacted] See Appendix letters of collaboration from [redacted] and [redacted] p. 13-14.)

Field Scout Training Classes - Outcomes and Results. As a result of this collaborative effort between [redacted] campuses, over 2,100 students have been trained to date. Specifically, students gain an IPM skill set that makes them more competitive for internships and successful in other agricultural careers. Non-degree adult students expand their IPM knowledge while developing a relationship with their local University. Employers benefit because they can hire trained summer interns (see Appendix, [redacted] p. 6-8). The [redacted] campuses benefit from the ability to offer a basic IPM course to compliment their course work and by directly serving stakeholders of the local community. This program aids IPM's mission to increase agricultural profitability while minimizing environmentally hazardous pest management practices. The first step in this mission is to offer basic education that provides the skill set necessary for students and crop advisors to implement IPM practices.

Field Scout Training Classes - Evaluation and Pitfalls. All students will receive a written evaluation at the end of each class and results will be used to determine programming and instructor effectiveness. Pitfalls are minimal because of the long history of this program, but winter snowstorms may affect instructor travel to other [redacted] campuses on rare occasion.

Rationale for Custom Applicator Program [redacted] corn and soybean production accounted for nearly [redacted] acres in 2007 (NASS 2008). Most of [redacted] grain and smaller acreage specialty crops receive at least one pesticide application as part of an IPM strategy, with commercial pesticide applicators treating a significant portion of that acreage ([redacted] et al. 2006). [redacted]s Pesticide Applicator Training Program trains private and custom applicators on safe and proper use of pesticides. [redacted] Department of Agriculture, Trade and Consumer Protection [redacted] certifies applicator knowledge, with particular emphasis on applicator safety and legal issues. However, no one was providing hands-on training for these individuals in the application equipment they would be operating. In fact, many new applicators find themselves behind the wheel of a $250K sprayer carrying up to 160+ acres of mixed pesticide the first time they spray a customer's field. Inexperienced applicators are a potential recipe for disaster. From 2005-2007 [redacted] reported a total of 131 pesticide and fertilizer spills in [redacted] personal communication, [redacted].

Custom Applicator Program – Activities and Outputs. [redacted] IPM Program staff, [redacted] has coordinated the "Custom Applicator Program" (CAP) training course, which was hosted the past 3 years by [redacted] This 3-day training program for new custom applicators is a collaborative effort between the [redacted] IPM Program, [redacted] Crop Production Association [redacted] and the crop protection industry to help prepare new custom applicators for their first season in the field. Instruction components include: hands-on equipment operations and road transport (utilizing 8 new spray rigs provided by the crop protection industry), pesticide application, spray nozzle and monitor operation, spray product management, mixing and loading procedures, field operations, plant and pest identification skills, personal safety and record keeping requirements. [redacted] IPM Program provides coordination and instruction [redacted] provides partial instruction and a site to operate

application rigs, [redacted] provides stakeholder curriculum input, and the crop protection industry provides $2 M of equipment for use. Thirty two new applicators (enrollment maximum) will receive CAP training this year. In addition to continuation of the CAP training, beginning in 2009, an advanced level of CAP training in crop and pest management will be provided to 56 more experienced applicators. (See Appendix letters of collaboration from [redacted] p. 3, 15.)

Custom Applicator Program – Outcomes and Results. The program's strength is providing hands-on training to minimize the chances of crop and environmental mishaps. According to [redacted] Executive Director of [redacted] "The CAP provides an excellent opportunity for preparation of new custom applicators which fulfills the needs of those businesses that provide direct responsive service to [redacted] farming operations." [redacted] continued by explaining that "The CAP would not be possible without the efforts and guidance of [redacted] partners that provided leadership in development and delivery the program". CAP training is expected to advance two National IPM Roadmap goals. Pesticide spills and mishaps will be reduced, which will directly reduce environmental impacts and improve applicator safety. Fewer misapplications will lessen the impacts of pest management on human health.

Custom Applicator Program – Evaluation and Pitfalls. Student operating performance is rated by their instructors and they complete a final exam. Copies of both are returned to their employers. Annual participant and employer surveys are used to identify changes to curriculum and program direction. The major pitfall would be the loss of collaboration with [redacted] because no other facility and site can accommodate this scale of training.

Focus Area 3. IPM in Agronomic Crops

Rationale for IPM Programming in Agronomic Crops. [redacted] farmers grow significant acreages of corn ([redacted] M acres), soybean ([redacted] M acres), alfalfa ([redacted] M acres), and wheat ([redacted] M acres) (NASS 2008). These crops are needed internally to support the state's dairy and biofuel industries or are directly marketed. Their total farm gate value exceeds $[redacted] B annually. Economical and effective pest management is vital to sustain [redacted] family farms, especially with recent volatile commodity prices and high input costs, which challenge the profitability of [redacted] farmers. Recent market trends coupled with several environmentally and economically questionable pest management practices have created new IPM concerns as identified by stakeholders at the 2008 [redacted] Listening Session and by the IPCM Technical Advisory Committee. Specific IPM issues include the prophylactic use of foliar fungicides on corn and soybean, Western bean cutworm identification and management, and the risk of glyphosate-resistant weeds ([redacted] 2006, 2007) in addition to the continual need for seasonal IPM recommendations (see Appendix, [redacted], p. 5, 9). These practices have large economic implications. For example, foliar fungicide applications to corn were estimated to cost [redacted] growers $12.5 M in 2008 (personal communication, [redacted]). In addition, 2008 field surveys indicate herbicide applications are being sprayed late in corn and soybeans, costing $39/a and $26/a in lost yield, respectively ([redacted] 2009). To address these needs, farmers, scouts, and consultants need to be trained with the appropriate knowledge and skills to respond to these pest management issues. Then, farmers and consultants need access to research-based IPM recommendations to manage these pests to maintain profitability, reduce unnecessary expenses, minimize the risks of resistance, and avoid unnecessary fungicide

applications in the environment to achieve IPM Program goals. (See Focus Area 3 Logic Model, p. 19).

IPM in Agronomic Crops – Activities and Outputs. The IPM Program has built its educational efforts around core programs, which are designed to instill IPM knowledge through basic training for students (future crop scouts) and crop advisors. These core programs are augmented by advanced training opportunities, which use innovative training efforts that are conducive to farmer and crop advisor learning needs.

1. Core IPM Knowledge. Core educational efforts are provided by three IPM Field Crop Scout Training Classes and the Certified Crop Advisor (CCA) Pre-Test Training Program, which are designed to offer basic pest management information. The collaboration enabled under Focus Area 2 allows the IPM Field Scout Training Classes to be delivered and provide core IPM knowledge. The CCA Pre-Test Training Program is a 2-day workshop held 2 months before the exam and is designed to assist participants with the core knowledge necessary to pass the state CCA exam and to become a knowledgeable crop advisor. A valuable outcome of this course is that these CCAs will receive pest management education in the future as they maintain their certification are IPM staff who coordinate and assist with teaching these programs. A total of 2,000 students and advisors will be trained annually. These core educational programs have evolved using stakeholder input to develop training programs to serve the needs of the agricultural industry (see Appendix, 6-8, 11).

2. Advanced IPM Knowledge and Skills. The IPM program is constantly responding to stakeholder's needs for innovative and timely educational programs and materials which build on the core programs (see Appendix p. 2, 3, 6-8, 11). The Crop Diagnostic Training Center was initiated in 1996 and is coordinated by Extension faculty assist with training. The Crop Diagnostic Training Center offers in-field, hands-on training for small groups of crop advisors to facilitate more discussion and exchange of ideas. This training method is ranked highest by participants when compared to classroom training and traditional field days. As a result of program evaluations and increasing levels of participation, we propose to offer this program in the future. Our training emphasis will include three training sessions during the 2009 growing season and will have a capacity for training 250 crop advisors. Training topics vary each year and are based on stakeholder input of current needs and participant's evaluations.

3. Emerging Pest Management Recommendations. The IPM Program has and will continue to collaborate with Extension faculty to offer timely and relevant IPM-based recommendations for agronomic crops. This education is delivered through the following methods.

- Field programs. These training programs will build on past successes and incorporate suggestions gained from recent program evaluations. Examples of successful training programs include those which we have partnered with the Soybean Marketing Board (see Appendix, p. 9) and Extension agents. Both programs were hands-on training and were coordinated by IPM staff. During the summer of 2009, three regional field-based educational programs are planned to provide training to 200 growers on foliar

fungicide use in corn and soybean, proper timing of weed management practices to protect yield, and glyphosate resistance weed management.

- Seminars. IPM Program staff anticipate providing 30-40 IPM presentations during the year at educational programs not directly coordinated by our staff. These include county, regional, and state conferences and will reach a total audience of 1,800 growers and crop advisors. These venues are highly effective for disseminating IPM information directly to practioners.

- Webinars. 2009 was a webinar series designed to reach large audiences of producers in a short period of time with timely IPM and crop management information before management decisions are made. The IPM Program will coordinate 8 webinars which are presented by Extension faculty and hosted at over 30 sites by county extension faculty.

- County Sweep Clubs. The IPM Program, in partnership with the Nutrient and Pest Management Program and Entomology, will continue to support 7 county sweep net clubs hosted by county extension agents. These clubs guide growers on IPM practices for potato leafhopper management without using prophylactic insecticide applications.

- On-Farm Research/Demonstrations. Industry has promoted foliar fungicides regardless of disease incidence or severity and degree of hybrid resistance. Determining treatment thresholds is a priority of Corn Growers (see Appendix, , p. 5). The IPM Program will collaborate with Dr. Plant Pathology and county extension agents to conduct 10 on-farm trials to accurately assess fungicide use results in the third year of an on-going study. Although this project has a research component, the outcomes will provide critical extension information requested by stakeholders. Results from 2009 trials will be disseminated through the Extension network of county agents and grower meetings.

- IPM Communications. Design and dissemination of IPM educational materials has been another strong component of the IPM Program and has been encouraged by the IPCM Technical Advisory Committee and stakeholders (see Appendix, , p. 2-4, 6-8, 11). The three types of communications supported by the IPM Program are 1) e-newsletters, 2) print media, and 3) training videos. The Newsletter is an electronic newsletter that features weekly pest and crop management information through the growing season (http: Annual statistics confirm an average of 400 visitors per day (up to 700 during the peak use season) who access 60,000 individual pages per month. is responsible for design and maintenance. Articles are written by faculty and IPM staff and the newsletter will continue in 2009. Print media include fact sheets and bulletins and continue to be an important delivery method and training supplement for the IPM Program. In 2009, we will revise a soybean aphid scouting and management guide and develop a corn fungicide use bulletin. As time permits, we will also design other IPM print materials for collaborating Extension faculty. The IPM Program has produced several low cost, short training videos (e.g. which have been highly effective with audiences. During the 2009 growing season, the IPM Program plans to expand this effort and develop an IPM video library based on in-season

management issues. Ten videos will be filmed and distributed through the [redacted] Crop Manager web site and integrated into training and local meetings. [redacted] instructors have already expressed their support for this project.

IPM in Agronomic Crops – Outcomes and Results. The core IPM educational programs will provide the basic skills necessary for all crop consultants and growers and will lay the foundation for an IPM philosophy that improves/protects grower profitability and limits environmental impacts of pest management recommendations while negating impacts on human health. Without these basic skills (identification, knowledge of pest life history, crop growth and development, etc.), intelligent pest management recommendations cannot be formulated. Advanced multi-disciplinary training efforts will provide specialized information required to more effectively manage pests. Outcomes from these advanced training sessions move growers towards the goals of the National IPM Roadmap by providing decision making tools to make economically sound decisions; information on pesticide use timing and proper selection to ensure greatest economic benefit if/when used; resistance management techniques that reduce overall amount of pesticides used; and providing science-based information on IPM tactics.

IPM in Agronomic Crops – Evaluation and Pitfalls. The [redacted] Program's standard evaluation plan measures knowledge and skills gained through training, assesses impacts on grower practices and advisor recommendations, and seeks input for future events. Program participants are requested to complete an evaluation at the end of each training program. These evaluations will determine if content was appropriate for the audience, measure specific impact of the training session, and assess the delivery method. Due to extensive staff experience with the programs, these activities have few pitfalls other than unpredictable weather. Expanded use of videos will be the newest activity, but risks seem minimal based on preliminary production experience and use over the past 2 years.

Focus Area 4. IPM in High Value Crops

Focus Area 1. IPM Coordination

Situation: IPM outreach activities in need coordination among Extension and partnering associations, agencies, and stakeholders to develop an effective and efficient system to meet short-term stakeholder needs and reach the long-term goals set forth in the National IPM Roadmap.

Inputs	Outputs		Initial Outcomes	Intermediate Outcomes	Long-term Outcomes
	Activities	Participation			
• IPM Coordinator • IPM Steering Committee • IPM Program Staff	• Organizational leadership of IPM • Gather stakeholder input • Pest/Pesticide Use Reporting to EPA • Leadership/service on IPM- related committees	• IPCM Technical Advisory Committee • IPM Steering Committee • Extension Self-Directed Teams • • CCA Board • Assn. of Professional Ag. Consultants Board	• Provide organizational leadership • Gather stakeholder input • Support county and state level IPM programming • Represent at regional and national meetings • Provide pesticide and management use data • Avoid duplication of effort	• Use stakeholder input to develop IPM educational activities • Facilitate statewide IPM programming efforts • Adapt ideas from regional meetings to needs • Increase adoption of IPM practices	Increase benefits of IPM • Increased grower profitability • Reduce environmental impacts • Protect human health
Evaluation Strategy: Use planning meetings, surveys, evaluations, and personal contact information to determine stakeholder needs.					

Focus Area 2. IPM Collaboration

Situation: needs an infrastructure of trained field scouts and applicators to maintain an effective IPM system. Resources at Crop Production Assn. need to collaborate to deliver high quality programs without duplication.

Inputs	Outputs		Initial Outcomes	Intermediate Outcomes	Long-term Outcomes
	Activities	Participation			
• IPM staff • faculty • campus • faculty/campus • faculty/campus • faculty/campus facilities • Crop Production Association • Crop protection industry	Field Scout Training Classes • 1 cr. IPM classes at - Custom Applicator Program • Planning meetings • 3 day training program at • Behind-the-wheel instruction/Hands-on classroom training	Field Scout Training Classes • 35, 20, and 25 students trained, respectively Custom Applicator Program • 32 new commercial applicators trained annually	Students trained as field scouts will be able to: • Identify key insect, disease, and weeds • Scout and record pests • Stage field crops Commercial applicators will have: • Improved knowledge and skills in safe pesticide application and equipment operation	Students trained as field scouts will: • Be employed by consultants • Increase IPM services Commercial applicators will: • Mix, transports, and apply pesticides in an environmentally safe manner • Safely operate application equipment	• Improve farm profitability through informed pest management decisions • Minimize adverse environmental and health effects from negligent pesticide applications or pesticide spills
Evaluation Strategy: Field scout classes are evaluated with a final exam and course evaluation. Custom applicator skills are rated and knowledge is tested with an exam. Employers and applicators are surveyed to refine the curriculum. Evaluation data is reported back to stakeholders for program planning.					

Focus Area 3. IPM in Agronomic Crops

Situation: [redacted] corn, soybean, and alfalfa growers need research-based IPM recommendations and educated advisors to effectively manage a diverse array of critical and emerging pests to remain economically viable while producing safe food and feed and protecting [redacted]s sensitive lands.

Inputs	Outputs		Initial Outcomes	Intermediate Outcomes	Long-term Outcomes
	Activities	Participation			
• Stakeholder input • [redacted] IPM staff • [redacted] faculty and county agents • Host farms for demonstrations • Partnering commodity associations	• Field Scout Training (detailed under focus area 2) • CCA Pre-Test Training workshop • 3 Crop Diagnostic Training Center workshops with hands-on, in-field training • 8 Regional Pest Management Update Meetings • 8 [redacted] Webinars • 10 Corn fungicide research and educational plots • 7 Potato leafhopper sweep net clubs • IPM Communications - [redacted] Crop Manager Newsletter - Print media -IPM Videos	• 80 crop scouts • 615 certified crop advisors and 250 retail agronomists and other ag-professionals • 850 corn, soybean, and alfalfa growers • 35 county Extension agents • 40 NRCS, DATCP agency staff • 15 technical college faculty	• New or less experienced personnel will gain core knowledge of pest identification, life cycles, and management • Corn, soybean and alfalfa growers and crop advisors will know: - Appropriate uses of foliar fungicides and economic returns - Corn disease identification - Management practices to delay herbicide resistance - Currently recommended IPM practices - Identification and thresholds of western bean cutworm • Crop advisors, ag-professionals, and other staff will have improved diagnostic skills	• Growers and crop advisors will have greater knowledge and skills to make pest management decisions • Fewer growers will make prophylactic fungicide application to corn or soybean • Growers will have increased yields from timely herbicide applications • Increase the long-term utility of important pesticides through stewardship to avoid resistance	• Increased grower profitability through more effective pest management and knowledge-based pesticide use decisions • Reduce environmental impacts of unnecessary fungicide applications

Evaluation Strategy: Use surveys, evaluations and personnel contact information to determine stakeholder needs and evaluate how the training programs have increased participant knowledge and skills related to each of the IPM training topics. Evaluation data will be reported to stakeholders for planning and will be used to leverage additional support and resources for IPM programming.

Typical Literature Citation format

Example 2

IPM for High Value Crops (Vegetables)

In [redacted] processing vegetables and fresh market vegetables are grown on 7% (36,000 acres) of the farm land in [redacted] with a combined value of $34 million in gross receipts. This area of emphasis will focus on 3 major areas: implementation of new IPM technologies for cucurbits, soil health education for soil borne pathogens, and maintenance of an insect trapping system for the major insect pests of vegetables. In recent years, competition from other regions and countries, losses from endemic and migratory pests and fluctuating grain prices have impacted the profitability of the vegetable industry. Stakeholders were involved in the identification of these priorities at the [redacted] Vegetable Growers meeting, Watermelon Growers Meeting, Pest Management Strategic Plan Meetings and by personal communication with consultants, processor field men and agribusiness personnel involved in the delivery of IPM programs to producers.

Continuation of IPM Efforts and Implementation of New IPM Technologies in Cucurbits: The watermelon IPM program, delivered by both private consultants and agribusiness, continues to have a multi-disciplinary and multi-state approach (University of [redacted] and University [redacted] to total crop management system for insect, diseases and nutrient management. This program provides a basis for expansion into other cucurbits such as pumpkins, the incorporation of new information on the use of trap crops ([redacted] et al.,2006) and seed treatments to control cucumber beetles in cucurbit systems, the maintenance of the Melcast disease forecasting system in watermelons and continued participation in the ipmPIPe for downy mildew in cucurbits. The proposed activities will be accomplished by Extension IPM Coordinator and Associate(Entomology), Extension Plant Pathologist, Extension Weed Specialist and Extension Educators from all three counties at the University [redacted]. **Inputs and Activities:** (a) Trap cropping demonstrations will be conducted on 3-5 farms to demonstrate the effectiveness of perimeter crop of cantaloupes around watermelons to reduce the number of foliar insecticide sprays needed to control cucumber beetles. (b) Field demonstrations of one commercial applied neonicotinoid seed treatments will be established in 3 commercial pickling cucumber fields to demonstrate its' usefulness in a reduced risk program for cucumber beetle control. (c) The Melcast disease forecasting system in watermelons will continue to be a multistate program; however, the University of [redacted] will be submitting the request for funds through their coordination proposal to continue seven SkyBit locations (three for [redacted] and 4 for [redacted]) and to automate the transfer of data from Skybit to Melcast. (d) We will continue to be part of the cucurbit ipmPipe downy mildew forecasting system. Cucurbit sentinel plots will again be established at our 2 research stations. (e) A shielded sprayer system will be demonstrated in up to 5 commercial fields to allow solicitation of feedback from

producers for modifications to the sprayer and grower evaluation of post emergence herbicide efficacy. [redacted] has built a proto-type sprayer that growers can build themselves. **Outputs:** In 2009, [redacted] Extension Plant Pathologist ([redacted] and 20% extension appointment – [redacted]) will continue provide the educational piece to producers in [redacted] through individual faxes, our Weekly Crop Update Newsletter and the University [redacted] IPM website (Appendix B). We will continue to provide links to the cucurbit ipmPipe downy mildew forecasting system as well as updates will be sent to clientele using Weekly Crop Update. Once demonstrations are completed and growers' inputs are incorporated, a print/web publication will be developed on building the shielded spraying for post emergence weed control. **Expected Outcomes:** Use of a perimeter trap crop for cucumber beetle management in watermelons could result in the elimination of 1-2 early season foliar sprays for cucumber beetle. Neonicotinoid seed treatments will be a viable option for the loss of carbamate insecticides providing economic control, increased worker safety and reduced levels of active ingredients in the environment. Producers using the Melcast system will continue to save $15-30 per acre in reduced fungicide use on watermelons as reported in previous surveys. The use of the cucurbit ipmPIPE downy mildew forecasting system will result in timely applications and prevention of economic losses from this disease, especially in pickling cucumbers. Producers will increase the adoption of cover crops (particularly cereal rye) on 30% for no-till pumpkin acreage by improving weed control through use of novel herbicide application. **Evaluation:** The utility, ease-of-use, and effectiveness of the shielded sprayer in pumpkins will be evaluated by the Weed science research associate who will be working directly with growers to use it in on-farm demonstrations. Growers will be asked direct questions at time of application and follow-up will be conducted in the fall following its use. These follow-up evaluations will either be a survey, phone conversation, or one-on-one conversations. Bench mark data will be collected from producers participating in the demonstrations to document past losses from cucumber beetles and past insecticide use pattems. Yield data and crop quality assessments will be done with this same group at harvest to document the affect of these practices on final crop quality, yields and insecticide use. Pre-season and post season surveys will also be conducted with cucurbit growers and consultants using the Melcast and ipmPIPE downy mildew forecasting system.

Soil Health Education for Soil Borne Pathogens: Vegetable crops are susceptible to a number of soil borne pests. Although current control practices include fumigation and the use of soil applied materials, the most effective control is the use of long rotations with non-host crops. Long rotations are difficult to achieve on many farms due to land limitations (inadequate acreage). This problem has been worsened by the pressure of development and the decrease in farmland for rotations. At the same time, there has been considerable research related to cover crops, green manures, compost, organic matter, and rotations in the past 10 years and there is ongoing research in the region on the effect of different rotations and species to improve soil health and reduce soil borne pests ([redacted] et al., 2006; [redacted] et al., 2004; [redacted] 2004, 2007). We propose to do a coordinated educational effort on soil health with a specific emphasis as to how it related to IPM for vegetables with field demonstrations, classroom sessions, publications, and on-farm training sessions starting in 2009. The proposed activities will be accomplished by the Extension Plant Pathologist and Extension Educators from 2

counties at the [redacted]. **Inputs and Activities:** (a) Creation of written and web-based materials on evaluating soil health and healthy rotations for vegetable crops with emphasis on its part in IPM programs. (b) Purchase of soil health testing kits for on-farm demonstrations. (c) Demonstrations and field trainings on the use of different cover crops and green manure crops in rotations, the effects on soil health, subsequent vegetable performance , and pest abundance (this will be over a two year period for some sites). (d) Demonstrations and field trainings on the use of different types of composted materials, the effects on soil health, subsequent vegetable performance and pest abundance. (e) Demonstration and field trainings on biofumigants as alternatives to synthetic fumigants. This will be compared with an integrated soil health improvement approach appropriate to plasticulture. Methods and goals will be similar to previous bullets. (f) Two to four classroom sessions will be conducted on the topic of soil health as a part of vegetable IPM programs. Sessions may be during Vegetable association meetings, crop advisor training sessions, a fieldman school, or county based meetings. Written resource and training materials will need to be developed or adapted for soil health as a part of a vegetable IPM program. Materials will also be posted on-line. This will require the assistance of a part-time employee. These materials will need to be copied or printed with associated costs. Soil health test kits will need to be purchased along with soil health demonstration materials. Part time employees will also be needed to help set up and conduct demonstrations and training sessions. Other materials will be needed to conduct demonstrations (compost, seed, etc.) and for field trainings.
Outputs: Two to four classroom sessions, four demonstrations, and four field trainings will be held using the written materials developed. The field demonstration sites will be used for trainings and will involve active soil health testing. Target clientele are vegetable farmers, farm employees, crop advisors and their crop scouts, extension personnel, agricultural chemical sales personnel, and agency personnel (NRCS, Conservation District, Department of Agriculture). **Expected outcomes**: Clients will improve their knowledge of the soil health improvement and soil health monitoring as a part of a vegetable IPM program. Integrated soil health improvement practices will be incorporated into recommendations to put into practice on farms. The ultimate goal is to improve the profitability of farm clientele by reducing soil borne diseases and other soil borne pest and reducing the need for fumigants or fungicides. Economic impacts will be demonstrated on-farm by measuring improved vegetable performance in the on-farm demonstrations. Overall success of this program cannot be easily measured in a one year period. However, adoption of soil health improvement practices and soil health monitoring by those attending sessions will be monitored and reported. It is expected that 25-50 vegetable growers will adopt these practices on farm as a result of this extension program initiative. **Evaluation**: Written evaluations of educational programs will be conducted at the end of each classroom or field training session with questions on what was learned and what will be put into practice. A written evaluation of the resource materials on soil health as a part of vegetable IPM will be included with the written materials and will be collected by mail. A survey of practice adoption will be conducted in 2010 along with questions on economic impact.

Maintenance of Insect Trapping Systems for IPM Decision Making in Processing and Fresh Market Vegetables: Since the late 1970's, an insect trapping program has been coordinated by the Extension IPM program. Data is collected twice a week by a blacklight trap technician and reported the same day on our website. We currently have black light traps and pheromone traps for corn earworm placed on vegetable farms throughout counties. A survey of consultants using this information indicated that (1) blacklight and pheromone trapping program is used to protect vegetable crops from insect pests (corn earworm and European corn borer) that are valued in excess of $30 million; (2) Trapping information is used to make treatment decisions on the major vegetable crops grown in including peppers, potatoes, snap bean (fresh market and processing) and sweet corn (fresh market and processing); and (3) Although traps are only part of the IPM tool box , consultants indicated that their ability to scout timely, economically and precisely would be adversely affected without this trap network. The proposed activities will be accomplished by the Extension IPM Coordinator and Associate (Entomology), and a summer technician. **Inputs and Activities**: Thirteen black light traps and eleven pheromone traps will again be placed on the same vegetable farms throughout counties. A trapping technician will drive to all location twice a week, service the trap and report the information to the Extension IPM associate and specialist electronically on the same day. **Outputs**: Trapping data is placed on our website and on a recorded message on the same days the traps have been serviced. The use of the website in combination with a recorded message ("Hotline") allows users to access the information 24 hours a day. The recorded message also provides additional information on required spray intervals for crops such as peppers, snap beans and sweet corn. Links to the website are also provided in the Weekly Crop Update. This information is also reported to (run at to provide trapping information to a larger group of clientele in the entire United States. **Expected Outcomes**: Producers and consultants using trapping information will continue to make cost effective, timely spray decisions as well as reduce sprays when insect pressure is light. This data will also be used by Extension programs in other states as part of their insect forecasting systems. If funded by the IPM Competitive Grants program, it will also be used to document reduced populations of European corn borers as a result of Bt corn adoption and allow for the development of new thresholds for major vegetable crops (sweet com, peppers and snap beans) resulting in reduced insecticide use on these vegetables. **Evaluations**: A survey of producers, consultants, field men and agribusiness will be conducted in the spring of 2009 to evaluate the value of this trapping network to each group.

IPM in High Value Crops (Greenhouse)

Urban forestry relies heavily upon the green industry for the high quality plants found around businesses, cemeteries, parks, schools, etc. and trained professions to maintain these plants. Nurseries and greenhouses provide a variety of plants including ornamental trees, shrubs, bedding plants, flowers, cut flowers, ground cover and vines to name a few. In the nursery and greenhouse sector of the green industry had a value added impact of $44.4 million to the state economy. This sector of the

green industry has recently had increased competition from imports, especially in the cut flowers market. The movement of plants from other locations within the U.S. or overseas has lead to the discovery of new biotypes (e.g., whitefly biotype Q) or new pests (e.g., Gynaikothrips uzeli). Pests such as emerald ash borer, Asian longhorn beetle, and Sirex wood wasp have been found in states neighboring [redacted] and monitoring programs are underway. This project will visit various growers in [redacted] evaluate the IPM practices of the business and provide the owner with a detailed report. Fact sheets will be written and workshops will be conducted to instruct the greenhouse and nursery sectors about new pests and IPM practices in their businesses. Stakeholders were involved in this process during meetings of the [redacted] Nursery and Landscape Association as well as during bi-annual meetings of the [redacted] University Ornamentals Task Force. **Inputs and Activities:** The county extension agents and the ornamentals IPM specialist will work with [redacted] Department of Agriculture once a week to inspect greenhouses or nurseries in each county. An additional employee will be trained as an IPM scout to help critique IPM practices used by visited businesses. Both workshops will be held at a cooperator's business. A score sheet detailing IPM practices will be developed by county agents and the ornamentals IPM specialist. This score sheet will be used to document how well the visited business follows IPM practices. The agents, specialist, or scout will accompany a representative from the department of agriculture on their visits to greenhouses or nurseries one day a week during the growing season. The agent or scout returns to the office and enters the data on the score sheet into a data base and submits a report to the business with tactfully-presented IPM-oriented advice on practices or procedures the business may want to follow in the future. **Outputs:** The report submitted to visited businesses would be a custom-made IPM report of the business operations. The report will describe potential problem areas the business may have, IPM tactics to control the pests, and the agent or specialists recommendations. The business would also receive fact sheets about the different pest problems or other issues they may have (e.g., sanitation). Additionally, two workshops will be held at a cooperator's business. The workshop will demonstrate problems commonly found at businesses during the growing season and remedies for them. **Expected Outcomes:** The nursery and greenhouse professionals will have the opportunity to learn how IPM techniques are beneficial and tailor-made recommendations for implementing IPM in their business. The professionals will have up-to-date pesticide recommendations and will get to see IPM practices in use during the workshops. Growers will be able to follow IPM practices to improve plant quality while decreasing the likelihood of pests from information gathered from their individual reports, fact sheets and workshops. Awareness of different pests and IPM tactics will help some businesses avoid accepting contaminated material; thus reducing some operation costs. **Evaluation:** The workshops will have a brief written evaluation form participants will need to complete before they leave. This evaluation will ask for brief examples of what was learned and what they think they may be able to use themselves. Contact numbers will be sent to businesses with their reports so they may contact us with additional comments or questions.

Example 3

CONSUMER/URBAN IPM

Objectives: ***(1).*** *To provide in-depth training for county Extension agents on identification and IPM management strategies for common pest ants in* [redacted] ***(2)*** *To identify, define and communicate "green" management strategies for the household/structural pest management industry;* ***(3)*** *To develop and deliver an intensive training program for homeowners on IPM practices to reduce use of pesticides on lawns.*

Key personnel: Dr. [redacted] (urban entomology), [redacted] University. Dr. [redacted] (Urban Horticulture Extension Agent); ***Cooperator:*** Dr. [redacted] (Director), [redacted] Center.

Description of activities: **(1)**. A workshop for Extension agents focused on pestiferous ant identification and management will be held in [redacted] with [redacted] as instructors. Participants (25) will be provided with a field guide to structure-infesting ants, workshop identification keys and presentation handouts. Workshop topics will include an overview of ant biology with specific information on behavior and management of fire ants, Argentine and odorous house ants, carpenter and field ants, and newly introduced ant species. In addition to classroom instruction, participants will have time to observe ant behaviors in the field and will participate in a laboratory session on ant identification. Microscopes and laboratory materials will be provided for collecting, preparing and identifying ants, with an emphasis on key ant characters to enable agents to make sight identifications. The latest products developed for ant control, including equipment, baits, monitoring tools, and insecticide granules, dusts and sprays will be reviewed.

(2) Activities will include development of a web site (linked to the [redacted] Household/Structural Entomology web site) containing information to define and identify "green" pest control strategies and products, and a guide for pest management professionals (PMPs) on how to implement and offer green pest control services to the public. Information on green strategies will also be disseminated to stakeholders at PMP meetings. The initial phase of the project will be to gather data and resources on green strategies through review of current literature and reputable information available on web sites. In the second phase we will consult

with PMP companies that offer green pest management services, and in the third project phase we will summarize all of the information and develop content for the web site and presentations at PMP meetings. Important elements will include: 1) Available green (i.e. environmentally friendly) pest control strategies including non-chemical and low-chemical input; 2) Pest identification; 3) Monitoring and Inspection; 4) Green products including certified organic, minimum and reduced- risk products; 5) A template for record keeping and analysis; 6) Designing a green program; 7) Setting customer expectations and responsibilities; 8) Profitability in offering green services.

(3) The home lawn IPM training will be conducted in fall 2009 with classes in each of the three major urban areas of [redacted] The day-long training will be open to Extension agents and the public (anticipate 100 participants each location) and will include instruction in the areas of lawn establishment, home lawn care, pest identification, and control measures based upon IPM principles. The workshops will be publicized in local news media, and to Master Gardener graduates in the counties who will further publicize the training when answering phone inquiries. To reach a wider audience [redacted] Video Production Services will film the presentations and the videos will be accessible in Breeze format on the [redacted] website. Additional short video clips will be produced for individual lawn problems, such as specific disease, weed and insect pest control. Handouts for each presentation, along with additional relevant lawn information, will be copied and spiral bound for each participant. Home lawn care reference books will be available for purchase at reduced prices for those interested, including [redacted] *Lawns* and *Weeds of* [redacted] *urfgrasses.*

Outputs and expected deliverables; how products will be used: **(1)** Extension agents will leave the workshop equipped with a field guide for the management of structure-infesting ants, identification keys, presentation material and an in-depth review of the most important ant pests in [redacted] They will be current on the newest ant pest species in the state and will gain knowledge that will enable them to provide sound IPM recommendations for pest ants thereby reducing the amount pesticides applied for ants and preserving non-pest ant species in the environment. **(2)** While most PMPs have a basic understanding of the principles of integrated pest management, insecticides often are the only tool used to suppress pest populations in urban environments. The workshop instruction and related training materials will give participants knowledge and competence in the use of alternative strategies, and can be an impetus for them to develop a "greener" philosophy for selection and application of their pest control strategies. **(3)** Workshop participants will gain information on monitoring and identification of diseases, insect pests and weeds in home lawns, and on preventative pest management practices; i.e. how to avoid having to use pesticides. They will receive resource materials compiled in a spiral notebook, and will be able to review recorded workshop presentations on the Internet. The workshops will help the three area Urban Horticulture Extension agents to better serve and advise clients on the use of IPM in home lawn care. The ultimate outcomes of the training will be that homeowners will reduce the risk of misapplied or inappropriately applied residential turf grass pesticides, reduce the detrimental effects of pesticides on groundwater contamination, and to learn that through IPM they may have attractive lawns with less impact on the environment.

Means by which results will be evaluated: Participant surveys will be developed for each workshop/class and will be completed on-site to asses their level of satisfaction with the training and whether as a result they plan to implement more environmentally sound IPM practices. Please refer to the Coordination section for additional information.

I have not included examples of budgets or budget narratives, CVs, Conflict of Interest forms, Current and Pending support forms, etc.

Most questions were about program narrative and how the parts of the proposal should flow together.