Award Category: IPM Team/Group Program/Project/Organization

Nominee Name of Team/Group/Project: Pest Management University
Nominee Main Contact for Group (if applicable): Faith Oi
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•Provide a brief summary of the program's accomplishments (500 words or less)

Developing Pest Management University has been a 17 year journey with volunteers from the pest control industry, industry experts, regulators, and University of Florida faculty. Florida is home to the largest pest control industry in the nation with >4200 companies, >6600 certified pest control operators, ~31,000 active ID card holders (i.e., technicians) and an estimated 50,000 lawn maintenance personnel. When PMU was conceived, there were fewer than 19 inspectors to regulate the entire industry and they only had "specific authority" to regulate pesticide applications not IPM. There is no certification requirement (i.e., testing) in Florida for technicians. According to Florida Statute 482.091, technicians are compliant if the company has paid $10 for an ID card (482.091(5)), received 5 days of field training (482.091(3)), and documented "4 hours of classroom training in pesticide safety, [IPM], and applicable federal and state laws and rules…" (482.091(10)). The certified operator in charge is statutorily responsible for providing training, but can assign this duty to a senior technician (for whom there is no testing requirement).

Until 2007, when PMU offered its first class, the industry typically self-trained "on-the-job" to meet the state requirements. The statute does not provide guidance on specific topics that must be covered to satisfy IPM training, so the coverage of IPM and how to implement it was inconsistent, often inaccurate, and thus, rarely adopted.

The industry requested state-of-the-art training in order to fulfill their number one need: creating and maintaining a well-trained work force. An advisory committee was formed of individuals from diverse backgrounds, committed to training. We worked from 2000 to 2006 to develop priorities, wrote grants, fund-raised, and built phase I that consisted of building construction elements which pests use to gain entry into structures. In phase II, we built a house used to complement the building construction elements. Total funds raised: >$616,000. Teaching "spraying-only" does not require such a facility. The facility was designed to teach the principles and practice of IPM.

Since 2007, PMU has records of almost 2,000 registrations. In 2007, we offered one course (Termite Foundations) to ~20 people from 7 companies. In 2016, we had 347 registrations from 94 companies (4 of which are in the Top 100 according to PCT's industry survey), 1 school district, over 18 classes in the categories of General Household Pests, Termites and Wood-Destroying Organisms, and Lawn & Ornamental Pest Management.

Using PMU for training, we have been able to:

- Provide continued support to school IPM in the absence of other funding.
- Demonstrate that IPM-trained teams in schools can save significant sums of money (~$250,000) and decrease pests by system-wide IPM implementation.
- We have created a network of IPM-trained PMPs and they have partnered with school districts and others when appropriate.

- Provide training for companies/institutions that support IPM to satisfy "good manufacturing practices" as part of the Food Safety Modernization Act.
- PMU provides training on turf health and compliance with fertilizer ordinances to protect water quality.

PMU is becoming a national and international resource for urban IPM programming.

•Describe the goals of the program being nominated; addressing why the program was conducted and what condition does this activity address? (300 words or less):
Pest Management University is an academy of hands-on and classroom training for the pest control industry. It was initially conceived with industry and regulators to mitigate litigation due to failed termite treatments, but has expanded to other licensing categories. Condition addressed: The industry has historical self-trained, lacked standardization and consistent access to training. PMU's curricula is based on the task analysis (i.e., performance and learning objectives) used to develop the state certified operator examination. It is based in IPM, standardized, and offered at regular intervals through the year in the categories of wood-destroying organisms (WDO), general household pests (GHP), and lawn and ornamentals (L&O) pest management. It provides a path to becoming a certified operator not previously available.

From PMU Advisory Committee:
The mission: "…to be a world leader in training the pest control industry by delivering quality instruction using science-based information on current technologies, with concern for the environment, and human health and well-being."

Our vision: "Pest control is a combination of art and science. Our vision is to develop an academy where the pest control industry will receive state-of-the-art training in pest biology, control methods, laws, regulations, and Best Management Practices. Pest Management University (PMU) is a cooperative effort between the industry, University of Florida IFAS, and Department of Agriculture Consumer Services. There are over 35,000 members of the pest management community in the State of Florida who need current, practical, curriculum-based training. We will be the leader in developing an industry of problem-solvers who improve the quality of life with respect for the environment and human health."

"Within the next 5 to 10 years, we will expand PMU's capacity…Capacity expansion will include food safety programs, be the community-IPM clearinghouse for training and information for national and international clientele, including training for federal, state regulators, and educators."

•Describe the level of integration across pests, commodities, systems and/or disciplines that were involved. (250 words or less):
"Structural pests" impact everyone, regardless of location, rural or urban; thus, the principles of IPM for pests in and around structures are broadly applicable to different stakeholders. In addition to the accomplishments listed above, PMU provides IPM training on:

- Invasive pests such as the tawny crazy ant (recommendations: http://edis.ifas.ufl.edu/in889) and African bees that disrupt ecosystems. Companies trained at PMU are on the statewide bee removal list

(http://www.freshfromflorida.com/Consumer-Resources/Consumer-Rights-and-Responsibilities/Pest-Control/Bee-Removal-or-Eradication-in-Florida).

- Economically damaging invasive termites such as *Nasutitermes corniger* or *Coptotermes* spp.: State regulators receiving initial training on these pests from PMU (http://www.freshfromflorida.com/Consumer-Resources/Health-and-Safety/Protect-Your-Home-from-Pests/Termites/Conehead-Termite-Program; http://www.freshfromflorida.com/Consumer-Resources/Health-and-Safety/Protect-Your-Home-from-Pests/Termites/Formosan-Termite-Program)
- We also provide training in partnership with appropriate agencies on important public health pests such as mosquitoes and ticks transmit disease causing organisms, stored product pests that spoil food, pollinator protection and pesticides.
- Groups that have received training from PMU:

1. Pest control industry, including manufacturing representatives
    a. Companies by county and course: https://pmu.ifas.ufl.edu/alumni
    b. Attendees are also from AL, CO, GA, IL, KY, MD, NC, OH, OR, SC, TX, UT, WA, Abu Dhabi, Bahamas, Canada, St. Lucia
    c. International: entire course for attendees from Singapore, China, Japan, Taiwan; current request from India (planning)
2. State and federal regulators (FDACS, EPA PREP, EPA school IPM)
3. School district personnel, including purchasing agents
    a. Brevard, Collier, Escambia, Orange, Manatee, Palm Beach
4. In-service training for Extension faculty
5. Large supermarket chain
    a. Common pests of structures such as cockroaches, rodents, and filth flies also are correlated to negative health outcomes, including jeopardizing food safety.
6. A County Housing Authority

•What outcome describes the greatest success of the program? (250 words or less)

The greatest outcome of PMU is its continued growth into the "PMU family," a network of IPM-trained PMPs. The "PMU family" supports other IPM programs, such as school IPM. They work with county faculty at Extension offices on other pest control issues. The practice of IPM is not required or regulated in Florida. Thus, attendance is voluntary. Those who attend view PMU as an investment. Florida has >3,600 CEU opportunities per year. They could receive training and CEUs anywhere, often for free, but they chose PMU. We went from 1 class serving 7 companies and <20 people in 2007 to ~18-20 classes per year in 3 licensing categories. In 2016, we served 347 registrants from 94 companies (up from 73 companies in 2015), 1 school district, UF employee. Four of the companies that are regular PMU supporters are within the top 100 revenue generating companies in the nation. We are part of the path to certification. This was our fourth year of offering the state certified operator examination in cooperation with the Florida Department of Agriculture. We have been trusted to train second and third generation PMPs in modern methods based in IPM (i.e., not spray only) so that their family businesses can continue. We have been told that we are integral of company business plans for growth. We now have a network of trusted friendships built during the intense 2.5 days of training per class that cannot be found in a one-hour in-person or online training.

•Provide evidence of change in knowledge, behavior, or condition because of the program. (300 words or less)

We provide pre- and post-tests for every class since our first in 2007 that measure knowledge necessary to do pest control legally and effectively. Each student must attend Foundations before advancing to the Masters and Expert levels. As an example, in 2016, knowledge gained:

Termite Foundations, n=68: 37.4%
Termite Masters, n=34: 52.6%
GHP Foundations, n=78: 16.4%
GHP Masters, n=41: 8.3%
L&O Foundations, n=47: 28.3%
L&O Masters, n=18, 32.7%

From 2013 to 2015 (n=173), the knowledge gained: 29.5%. The large gains are due to 1) teaching attendees to correctly calculate the amount of termiticide to do a pre-treatment and post-treatment soil application for a house on a floating slab; 2) correctly name the common termites in Florida and know subterranean from drywood termites.

Behavior change: Clientele from the pest control industry usually do not partner with Extension for training. Companies/institutions that send attendees are willing to pay a fair fee for training and pull technicians from the field for ~3 days, a significant investment and behavioral shift for an industry used to self-training or attending seminars for free. Roughly 75% of the companies that send technicians for training are recurring customers. By comparison, using 2016 data, of those who attended the Foundations tracks, only about 19% had received CEUs at other Extension trainings. Roughly 21% said that they did not use Extension training at all (Termite, 25%; GHP, 24.4%, L&O, 12.9%).

School districts that attended PMU contact us regularly for pest control contract reviews or suggestions on how to word RFA to ensure an IPM service. In one case, a school district had to outsource pest control before it could hire another in-house technician. They knew about the emphasis placed on IPM at PMU, and found a company trained at PMU to fill their need.

•Provide evidence of client adoption of IPM practices, improve economic benefits, or pesticide use reduction because of project implementation. (500 words or less)

PMU provides training for School IPM programs in several counties, including Orange county. The case study is described below. Management and priorities have changed. It still serves as an example of the strength of IPM:

In April 2011, we reached out to Orange County Public Schools (OCPS) after 22 kitchen closings as a result of failing to control "vermin" as per Department of Health reports. We worked with then Supervisor Dale Seale to develop an IPM program that could be scaled for OCPS, the 10th largest school district in the U.S. The IPM program included deep cleaning of kitchens, intensive remedial pest control, and involving the cafeteria managers in the pest reporting process. A high-end facilities maintenance system existed at OCPS to capture work order requests. OCPS developed an additional internal electronic reporting system for pests in kitchens, which they continue to use. Cafeteria managers were tasked with reporting pests in monitors every Monday morning. The IPM coordinator was tasked with follow-up of cafeteria managers who did not report by 10 AM. Supervisor Seale also authorized training for any interested individuals. OCPS paid for 19 registrations to PMU. OCPS' IPM implementation was

rapid and initially successful. Work orders submitted for ant control only and only from June to August of each year illustrate this point:

2010: 299 work orders for ants
2011: 288
2012: 65, after implementing IPM

Successful IPM implementation decreased the amount of time dedicated to controlling ant infestations, resulting in increased time available for training. With additional time, Supervisor Seale attended the Termite Foundations so that he could apply what he learned to monitoring the contracted services for termite control. He also reported a savings of $250,000 to the district in 2012 due to efficiencies, mainly personnel changes, after IPM implementation.

In 2016, we trained IPM coordinators and technicians from Manatee (~46,705 students) and in Jan 2017 Palm Beach County Public Schools (176,724 students, 20,810 staff).

All of PMU's curricula are IPM-based; thus, we interpret our program growth as providing economic benefit to end-users. One sales person said that he takes our reference materials as proof of what they are offering a valid and effective service. He estimated about a 10% increase in sales.

A recent (June 2017) example of PMUs influence on pesticide reduction is our follow-up work with a zoo in a large metropolitan area. After PMU's IPM training, they requested that we review their pesticide storage shed and as a result, most of the products will be discarded and replaced with monitors of various types.

•Describe the team building process; how did the program being nominated get partners involved? Education and awareness are essential in an IPM program. (250 words or less)
In 2000, Florida had 3 pest control associations with different philosophies. The individuals who agreed that training was a priority self-identified and volunteered to serve on the PMU advisory committee with the consent of their respective associations. State regulators were as committed to building a training facility. We had previous experience in working together on other committees, including developing the good industry practices for WDO inspections. We started with a needs assessment which included reviewing the previous 10 years of enforcement actions, developed a mission and vision statement, wrote grants, fund-raised, and developed the curricula together. State enforcement actions from Q1 2000 to Q1 2003 showed that termite and WDO related issues resulted in 64.8% of all enforcement actions against the industry; thus, termites were still a priority. Within the year (2008), the committee agreed that GHP training should be provided and we should build a house to complement phase I. The house was completed in 2011. In 2015, we re-introduced the L&O track with faculty from plant pathology, weed science, environmental horticulture, and entomology. We also made it a goal of lower the average age of the advisory committee by about 10 years. We added the "next generation" of PMU supporters, many of whom are second and third generation PMPs who attended PMU. PMU's growth has been "organic." We have a Twitter account (@PMU_News) and Facebook page (https://www.facebook.com/PMUNews) where something is posted almost daily. We continue to listen to clientele and make course corrections based on evaluations.

•Did this project utilize any innovative methods that could be shared with others? (Please explain in 200 words or less)

PMU was built in an age of PowerPoint, mass trainings, and “free.” We are personalized, hands-on, and require investment. We adhered to the tried and true methods of Extension: meeting stakeholder and clientele needs, using a multi-level evaluation process for to receive feedback, and making course corrections accordingly. We use technology to streamline administrative functions so that we have time for personal contact. We started by collecting registrations fees via checks and now can use credit cards online. We also developed on online transcript system that the attendee take access no matter who his/her employer. PMU’s “innovation” is listening.