

CURRICULUM VITA (updated March, 2019)

ANTHONY M. SHELTON

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ACADEMIC RECORD:

St. Mary's College of California, Moraga, CA - 1967-71 - B.A. (Classics & Philosophy)

Cabrillo College, Aptos, CA - 1973-75 (Biology & Chemistry)

University of California, Riverside, CA - 1975-79 - M.S., Ph.D. (Entomology with emphasis in insect pest management and biological control)

PROFESSIONAL EXPERIENCE (ACADEMIC):

Research Assistant, University of California, Riverside, Department of Entomology - 1976-79.

Assistant (1979-85), **Associate** (1985-93) and **Full Professor** (1993-present), Department of Entomology, Cornell University's New York State Agricultural Experiment Station, Geneva, NY.

Responsible for developing sound insect pest management strategies for vegetables with spin-offs for other crops. Components of program stress insect population ecology, biological control, plant resistance, agricultural biotechnology, insecticide resistance, insect movement, trap cropping, and plant productivity and marketability as a function of insect infestations. In the last 25 years, a considerable amount of our effort has been devoted to risk assessment of insect management strategies, especially insect-resistant genetically engineered crops. Our program has a strong commitment to outreach education for the agricultural community and the general public.

Associate Director of Research and Associate Director of the Cornell Agricultural Experiment Station, Ithaca NY - 1993-2001. Responsible for enhancing research funding for CALS, initiating several new programs for CALS, administering Federal Formula Funds and integrating research and extension programs. Member of CALS administration.

Professor of International Agriculture and Associate Director of International Agriculture Programs, 2002- present. This position leads me to travel internationally for 2-3 months per year working on projects in developing countries including India and Bangladesh for Bt eggplant. I also have projects in China, South Asia and Eastern Europe.

Director of the USAID project: Feed the Future South Asia Eggplant Improvement Partnership in Bangladesh and the Philippines, Oct. 2015- present.

PRESENT DIVISION OF EFFORT:

Research - 90%
Teaching- 10%
Extension - 0%

PROFESSIONAL ACTIVITIES:

Sabbatical Leave:

Lincoln University, New Zealand- 1/07-4/07
University of California, Davis- 9/06- 12/06
Waite Institute, University of Adelaide, Australia- 1/02-5/02
Institute for Plant Protection, Wageningen, The Netherlands - 3/86 - 9/86

Professional Societies:

Entomological Society of America
Society for Invertebrate Pathology
International Organization on Biological Control
International Association for the Plant Protection Sciences
National Agricultural Biotechnology Committee (Chair in 2006-7)
Florida Entomological Society

Panels and Workshops Participant (selected):

European Food Safety Authority Conference on RNAi, Brussels 2014
Global Biosafety Management Program, India, 2009, 2010, 2011, 2013
Pest Management Alternative Program, Grant Review Panel, 2010
International Workshop for Biotech Regulators, Goa, India, 2010
Bt Eggplant Workshop, Manila, the Philippines, 2009
International Life Sciences Institute Workshop on Non-target Organisms, 2009
National Academy of Sciences, Board on Ag Review, 2008, 2009, 2010
Pest Management Alternative Program, Grant Review Panel, 2009
Western Region-IPM, Grant Review Panel, 2007
USAID-Plant Biosafety Systems Review Panel, 2007
European Food Safety Authority, Parma, Italy, 2007
Lincoln University (NZ) Curriculum Reorganization Panel, 2006
APHIS Workshop on Monitoring the Effect of Bt Plants on Non-targets, 2004
EPA Workshop on Monitoring Bt Plants, 2004
Cornell BARD Program, Director, 2004
Association of Liaison Office, USAID, Review Panel, 2004
Council on Agriculture, Science and Technology- Resistance to Pesticides, 2003
National Academy of Sciences Panel on Containment of GMOs, Presenter, 2002
Canadian Gov't Panel on Biotechnology, Ottawa, CN, 2002
EPA Workshop Series on Bt Corn Resistance Management, 2001
USDA-IFAFS Panel Manager, Biotechnology, 2001
EPA Risk/Benefits Panel for Bt Crops, 2000
Congressional Testimony on GMOs to the House of Representatives, 1999
Ag Biotech Stewardship Committee-Insect Resistance Management, 1998-2002
USDA/ARS Ithaca Review Panel on Biological Control, 1996
Dept. of Entomology Review, Univ. of Maryland, 1996
USDA Pest Management Alternatives Review Panel, 1996
USDA NC-IPM Review Panel, 1994
USDA Scientific Panel on Bt resistance, 1992
USDA Small Business Innovation Program, 1988
USDA/NRI Competitive Grant Panel on Insect Stress, 1984

Entomological Society of America and Other Scientific Duties (selected):

Session Organizer, Entomological Society of America, Vancouver, CN
Session Organizer, Int. Society of Biosafety Research, 2017, Guadalajara, MX
Session Organizer, International Congress of Entomology, 2016, Florida, USA
Program Organizer, 7th Int. Workshop on Diamondback Moth, India, 2015
Presidential Committee on Grand Challenges for Entomology, 2014
Symposium Organizer, ESA National Meeting, 2013
Symposium Organizer, 4th Int. Symp. on Biocontrol of Arthropods, Chile, 2013
Symposium Organizer, International Congress of Entomology, 2012, South Korea
ESA Team Award Committee (2011-2013)
ESA National Recognition Award Committee (2010-2012)

Board Member, American Entomologist, 2010- 2014
 Symposium Organizer, 6th Int. IPM Symp., Portland, OR, 2009
 Symposium Organizer, 3rd Int. Symp. on Biocontrol of Arthropods, NZ, 2009
 Symposium Organizer, International Congress of Entomology, SA, 2008
 Program Organizer, 5th Int. Workshop on Diamondback Moth, China, 2006
 Organizer, National Agricultural Biotechnology Council Annual Meeting, 2006
 Symposium Organizer, 2nd Int. Symp. on Biocontrol of Arthropods, CH, 2005
 Symposium Organizer, XVth Int. Congress of Plant Protection, China, 2004
 Symposium Organizer, International Congress of Entomology, Australia, 2004
 Symposium Organizer, ESA National Meeting, 2004
 Symposium Organizer, ESA National Meeting, 2003
 Subject Editor, Insecticide Resistance, J. Econ. Entomol., 2001-2014
 Committee on Ethics for ESA, 1998 –2002
 Program Committee, ESA Eastern Branch, 1992
 Linnaean Games Committee, ESA Eastern Branch, 1990
 Symposium Organizer, ESA National Meeting, 1988
 Program Committee, ESA Eastern Branch, 1988
 Program Committee, ESA Eastern Branch, 1983
 Symposium Organizer, ESA National Meeting, 1982

HONORS, AWARDS, FELLOWSHIPS (SELECTED):

Plenary speaker 8th Int. Conf. on Diamondback Moth, Tainan, Taiwan, 2019
 Plenary speaker 7th Int. Conf. on Diamondback Moth, Bangalore, India, 2015
 Entomology Society of America. National IPM Team Award, 2013
 Outstanding New Extension Publication, NYS Assoc. of Ag Agents, 2011
 Plenary Speaker, Entomological Society of Canada, Halifax, NS, 2011
 L. O. Howard Award Eastern Branch Entomological Society of America, 2011
 Fellow of the Entomological Society of America, elected in 2010
 Keynote Speaker, Int. Assoc. of Plant Biotechnologists, St. Louis, MO, 2010
 Chinese lectureship at 4 Institutes, 2009
 Cornell (CALS) Award for Applied Research, 2007
 National Ag Ext Award for Publication, “Organic Agriculture”, 2006
 NYS - Excellence in Crop Production Publication Award, 2006
 NE Regional Finalist Award for the "Swede Midge ID Guide", 2005
 Nat'l Assoc. Co. Ext. Agents, State Award and NE Finalist for Publication, 2005
 Ent. Soc. Am. Branch and National Recognition Award for Research, 2005
 Plenary lecture, Environmental Sciences and Forestry, SUNY, , 2004
 Plenary lecture, XVth Int. Congress of Plant Protection, China, 2004
 Am. Soc. for Hort. Sci. National Award for Extension Publication, 2004
 NYS Assoc. of County Ag Agents Award for brochure on swede midge, 2003
 CALS Professor of International Agriculture, 2002 to present
 Plenary lecture, Int. Conf. on Biocontrol of Diamondback Moth, France, 2002
 Cornell International Traveling Fellowship, 2002
 Plenary lecture, 4th Int. Conf. Diamondback Moth, Melbourne, Australia, 2001
 NOVA lectureship (Nordic Countries), 2001
 Plenary lecture, American University in Beirut, 2000
 New York State Award for Excellence in IPM, 1997
 China-US Scholar Exchange, 1996
 Plenary lecture, Nordic Agricultural Scientists, 1995
 Ent. Soc. Am. Branch and National Award Excellence in IPM, 1995
 Cornell International Traveling Fellowship, 1989
 Netherlands Ministry of Agriculture Research Fellowship, 1986

GRADUATE FACULTY ACTIVITIES:

Cornell Member of the Field of Entomology, 1979-present
 Cornell Member of the Field of Plant Protection, 1987-present
 International Agriculture and Rural Development, 2008- present

Teaching (10%, as of Dec. 2015):

Since 2014, I developed and teach ENT 7670 (2 units), Professional Development in Ent. required of all incoming entomology graduate students.

I developed and taught ENT 2410 (3 units in fall), Applied Ent. in 2012-4 and Entomology 441- Seminar in IPM. Taught from 1983-1996.

I regularly participate in the following courses:

IARD 4020 - Agriculture in Developing Nations

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CSS 4100- The GMO Debate: Science and Society

AEM 6600- Agroecosystems, Economic Development and the Environment

PL BR 4826 Plant Biotechnology.

Field trip provided for PL PA 419. Additional lectures in selected classes.

PROGRAM OVERVIEW:

The focus of our research program is to develop sound insect management strategies for vegetables, with spin-offs for others crops, using a sound understanding of insect ecological principles. This broad focus allows us the opportunity to work simultaneously in basic and applied areas on a number of important insects. Our program works with presently available strategies and helps incorporate them into pest management programs, and develops new strategies for the future. Examples of projects include: developing sampling and treatment guidelines for specific crops; understanding and modifying ecological factors that influence the risk of infestation; incorporating biological control into insect management strategies; studying mechanisms of host plant resistance and working with companies to develop resistant germplasm; conducting environmental risk assessments for Bt plants and traditional insecticides, evaluating presently registered insecticides and those under development for their effects on pests and non-target organisms; developing insecticide resistance management strategies; studying the movement of insects within and between crops in the agroecosystem; working in a team to develop and deploy Bt vegetable crops; developing trap crop strategies for IPM. Our extension program focuses on helping growers implement sound IPM strategies and educating the public about agricultural issues, including biological control and biotechnology. Our program is also involved in helping develop regulatory policies on a national and international level, especially for transgenic insecticidal plants. International activities are focused primarily in India, Bangladesh, China, and Latin America.

SELECTED RESEARCH AND EXTENSION ACCOMPLISHMENTS:

The accomplishments of our research program have been, in large part, due to the many technicians, graduate students, post-docs and visiting scientists we have had working in our program, as well as close working relationships with various colleagues in my own and in other departments and with industry. A partial list of our most significant accomplishments are:

Developed and implemented sampling programs and thresholds for insect pests of cole crops, Lepidoptera on sweet corn, and onion thrips on onions. In the case of processing sweet corn, the insect management program reduced the use of insecticides by ca. 50% per year. This program was transferred to the NYS industry through a private consulting company. The overall savings to the industry is ca. \$1M per year.

Documented the predators and parasitoids of pests of cole crops and Lepidoptera on sweet corn in NY and determined their effects on pest suppression and devised strategies to increase their effectiveness through use of selective insecticides and other practices.

Conducted the first open field release of a genetically engineered insect for control of a pest insect.

Managed a USAID project on Bt eggplant in Bangladesh and the Philippines.

Conduct a yearly program evaluating insecticides (conventional and biological) for control of insects affecting cole crops, sweet corn and selected vegetables.

Coordinated and published the first scientifically-based compendium on organic methods to control insects and diseases in vegetables.

Documented the ecology and population dynamics of the thrips complex in the varied agroecosystem of upstate NY and used this information to devise strategies for controlling onion thrips affecting cabbage and onions.

Published the first study documenting that the use of Bt plants was safer to a parasitoid than the use of conventional and organic insecticides. Developed a body of literature on the effects of Bt plants on natural enemies using resistant hosts to exclude potential 'host quality effects.'

Developed a defect action threshold for FDA that has, in conjunction with the development of host plant resistance in cabbage, dramatically reduced spraying for thrips in processed cabbage.

Studied the infestation patterns of onion thrips in cabbage, documented sources of plant resistance, worked with the seed industry and devised insecticide control strategies for the field.

With colleagues at BTI, conducted the first large-scale field test of a genetically altered virus for insect control in 1999. With colleagues at Oxitec, conducted greenhouse trials demonstrating that genetically engineered male-selecting diamondback moths can lower pest populations and slow the evolution of resistance to Bt plants. Conducted the first field-release in North America of a genetically engineered insect with a self-limiting gene for pest management.

Studied the epidemiology of a granulosis virus infecting imported cabbageworm and an NP virus infecting cabbage looper.

Determined the role of leaf surface waxes of cabbage in host plant resistance to neonate diamondback moth.

Coordinated a national program to document the resistance levels in diamondback moth to the major classes of synthetic insecticides. This has been extended to other countries.

Documented the occurrence of resistant diamondback moths in the Northeastern US as often being the result of insecticide practices in southern areas and the transport of the insects on transplants. This has become a major management tool for this pest in NY.

Documented resistance to *Bacillus thuringiensis* using field and laboratory methods. This was the first study published which documented actual control failures due to resistance.

Conducted studies on the management of resistance to *Bacillus thuringiensis* when it is applied as a foliar spray or incorporated into plants. In conjunction with Lisa Earle and Rick Roush, developed the Bt broccoli/diamondback moth system to evaluate various resistance management strategies for transgenic plants.

Developed and utilized the first rapid assay to detect resistance to pyrethroids in onion thrips, and used this technique to study its ecology in the onion landscape.

Coordinated the first large scale, cross-disciplinary Cornell Community Conference on Biological Control and coordinated the development of a WWW site Natural Enemies: A Guide to Biological Control Agents in North America. This site receives upwards of 15,000 "hits" per month.

Developed management programs for swede midge and leek moth, newly invasive species in the Northeast.

Documented gene flow between sexual and asexual lineages of *Thrips tabaci*.

Coordinated the development of educational materials on agricultural biotechnology for CALS and the Land Grant Community. This includes printed material (>140,000 copies) as well as the web site “Informing the dialogue about agricultural biotechnology.”

Worked with international scientists on management programs for insects affecting vegetables in several countries including India, Bangladesh, China, Mexico, Honduras, Nicaragua, Holland, Zimbabwe, Indonesia and Malaysia.

GRANTS

Since coming to Cornell in 1979, Shelton has consistently received large competitive grants to support his research and extension program. From USDA alone, he has been the PI or co-PI on 26 awards totaling >\$7,000,000 with the majority of them being single institutional awards providing the majority of funds to his program. In addition to USDA funding, he has received competitive grants from NY State totaling >\$400,000. The vegetable and chemical industries have provided > \$2,350,000 in support. In 2015, he received an award from USAID as the PI for a 3-year project on Bt eggplant in Bangladesh and the Philippines for \$4.8M and this was renewed for 1 year at \$1.6M.

PUBLICATIONS

256 journal articles, 4 Annual. Rev. of Entomol. articles, 38 book chapters, 2 books, 106 technical reports and 85 extension or popular press articles, 18 websites and 27 commentaries/reviews

Google Scholar Citations, 17717: h-index 66 (a h-index >60 is noted as “truly exceptional”) <http://shelton.entomology.cornell.edu/publications/>

OTHER INFORMATION:

Civic:

Board of Directors Smith Opera House, Geneva, NY, 2017-present
Hobart College Assistant Crew Coach- 2002 to 2005
Geneva Board of Education Facilities Committee 1999
Geneva Board of Education Member 1993- 1998
Geneva Educational Advisory Council (co-president) 1992-3
Geneva Schools Special Education Program (advisor)- 1983-5
Geneva Little League (coach) 1987-1990
Hobart & William Smith Head Crew Coach 1986-1987
Geneva Concerts (treasurer, vice-president, president) 1984-1993
Geneva Cub Scout (den leader)-1983
Geneva YMCA t-ball (coach)-1983-4