

## LUIS ALBERTO CAÑAS CASTRO

<b>Assistant Professor, Insect Ecology in Controlled Environments Dept. of Entomology The Ohio State University / OARDC 1680 Madison Ave. Wooster, Ohio 44691</b>	<b>Phone: (330) 263-3818 Fax: (330) 263-3686 Email: <a href="mailto:canas.4@osu.edu">canas.4@osu.edu</a></b>
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### **EDUCATION:**

- December 2000 **Purdue University**, West Lafayette, IN, USA.  
**Ph. D.** in Entomology.  
Dissertation: "Life History of *Leptinotarsa undecimlineata* Stal (Coleoptera: Chrysomelidae) in Honduras". GPA: 4.00 / 4.00
- August 1996 **Purdue University**, West Lafayette, IN, USA.  
**M. Sc.** in Entomology.  
Thesis: "Response of natural enemies to sugar applications in maize and their effect on fall armyworm *Spodoptera frugiperda* (J. E. Smith) populations in Honduras". GPA: 4.00 / 4.00
- August 1993 **Pan-American College of Agriculture**, Zamorano, Honduras.  
**B. S.** in Agriculture, major in Plant Protection.  
Thesis: "Technical and economical evaluation of action thresholds for control of *Spodoptera frugiperda* in grain sorghum". GPA: 3.64 / 4.00
- December 1990 **Pan-American College of Agriculture**, Zamorano, Honduras.  
**Agronomist**, minor in Business Administration. GPA: 3.34 / 4.00

### **SKILLS:**

- Research Experience developing ecological projects for management of pests of ornamental and vegetables grown in controlled environments. Experience conducting foreign exploration, conservation biological control and basic ecological projects. Use of life table and biodemographic analysis, behavioral techniques and sampling to investigate ecological questions in both natural and applied systems. Experience interacting with extension clientele and conveying information for biological control and integrated pest management programs in several ecological systems.
- Management Strong leadership and managerial skills. Experience supervising technical teams for research projects. Implemented IPM sampling protocols and supervised field and laboratory experiments.
- Teaching and Mentoring Experience lecturing and preparing course material. Knowledge of syllabus and class preparation. Experience mentoring students for research projects and thesis preparation. Served as adjunct statistic advisor for several students and helped devising and analyzing experimental designs. Experience using CARMEN for online class management.
- Statistics Strong statistic skills. Experience with design of experiments, analysis of variance, regression analysis, non-parametric statistics, life test analysis, and principal component analysis. Strong knowledge of statistical and scientific-graphing software packages: SAS, JMP, Minitab, Canoco, Sigma Plot and Delta Graph.

Languages Bilingual and fluent in English and Spanish.

Computer Software: MS Word, PowerPoint, Excel (macro creation), MS Access, Quattro Pro, File Maker Pro, STELLA research, ProCite, EndNote, Adobe Acrobat, Adobe Photoshop, MicroSuite Imaging Software, Internet mail packages, internet browsers and HTML editors (Dreamweaver). Knowledge of computerized greenhouse environmental management software (Qcom). Proficient on both PC and Macintosh environments.

### **TEACHING EXPERIENCE:**

#### **Classes**

- 2008 **The Ohio State University. ENT 460.** Economic Entomology and Insect Pest Management. Credits: 5, Enrollment: 15. Supported the class lead by Celeste Welty and Dave Shetlar. Winter Quarter, 3 January 2008 to March 13, 2008. Provided support with class recording and preparation and with online class delivery system (Carmen). Discussed principles of pest management and explained major tactics. The class was transformed to a computer assisted course as a stepping stone into converting it to a distance education class.
- 2007 **The Ohio State University. ENT 460.** Economic Entomology and Insect Pest Management. Credits: 5, Enrollment: 16. Team taught with Celeste Welty. Winter Quarter, 3 January 2007 to March 11, 2007. Discussed principles of pest management and explained major tactics. Currently working on transforming the class into a computer assisted course as a stepping stone into converting it to a distance education class. (Student Evaluation score = 4.3/5).
- 2006 **The Ohio State University. ENT 460.** Economic Entomology and Insect Pest Management. Credits: 5, Enrollment: 7. Team taught with Celeste Welty. Winter Quarter, 2 January 2006 to March 10, 2006. Discussed principles of pest management and explained major tactics. (Student Evaluation score = 4.9/5).
- The Ohio State University. ENT 795.04.** Advance Biological Control. Credits: 2, Enrollment: 9. Team taught with Dave Horn. Spring Quarter, 27 March 2004 to June 2, 2006. Discussed new advances in the science of biological control (Student Evaluation score = 4.7/5).
- 2005 **The Ohio State University. ENT 460.** Economic Entomology and Insect Pest Management. Credits: 5, Enrollment: 12. Team taught with Celeste Welty. Winter Quarter, 3 January 2005 to March 11, 2005. Discussed principles of pest management and explained major tactics. Modified 50% of lectures and added new concepts and findings based on literature searches. Developed 3 new laboratories and helped modify 3 others.
- 2004 **The Ohio State University. ENT 795.04.** Advance Biological Control. Credits: 2, Enrollment: 10. Team taught with Dave Horn. Spring Quarter, 29 March 2004 to June 4, 2004. Discussed new advances in the science of biological control. Developed the course and prepared the syllabus. Taught with Dave Horn. (Student Evaluation score = 4.8/5).

#### **Guest Lectures**

- 2008 **Insect Science Workshop.** Credits: 5, Enrollment: 11. Guest Lecture: "Greenhouse Insects", May 19, 2008. Mount Union College. 75% of the students in class were able to recognize the major greenhouse insect pests by the end of the lecture (only 8% were able to do so at the beginning of the lecture).

- The Ohio State University. HORT TEC T253.** Green House Bedding Plant Production (ATI) Credits: 4, Enrollment: 15 students. Guest Lecture: “Greenhouse Insect Pest Control Methods”, 24 January 2008. (Received peer evaluation letter).
- 2007 **The Ohio State University. ATI. HORT TEC T251.** Greenhouse Environmental Control (ATI) Credits: 4, Enrollment: 16 students. Guest Lecture: “IPM in Greenhouses”, November 8, 2007. (Received peer evaluation letter).
- ENT 660. Advanced Economic Entomology.** Credits: 5, Enrollment: 7. Guest Lecture: “Greenhouse IPM”, 23 May, 2007.
- ENT 660. Advanced Economic Entomology.** Credits: 5, Enrollment: 7. Guest Lecture: “Area Wide IPM”, 18 May, 2007.
- Insect Science Workshop.** Credits: 5, Enrollment: 11. Guest Lecture: “Greenhouse Insects”, May 14, 2007. Mount Union College.
- The Ohio State University. HORT TEC T253.** Green House Bedding Plant Production (ATI) Credits: 4, Enrollment: 11 students. Guest Lecture: “Greenhouse Insect Pest Control Methods”, 25 January 2007. (Received peer evaluation letter).
- 2006 **The Ohio State University. HORT TEC T253.** Green House Bedding Plant Production (ATI) Credits: 4, Enrollment: 18 students. Guest Lecture: “Greenhouse Insect Pest Control Methods”, 26 January 2006. (Received peer evaluation letter).
- The Ohio State University. HORT TEC T251.** Greenhouse Environmental Control (ATI) Credits: 4, Enrollment: 26 students. Guest Lecture: “IPM in Greenhouses”, 15 November 2006. Discussed current tactics for insect management in greenhouses. (Received peer evaluation letter).
- 2005 **The Ohio State University. ENT 880.** Research and Training Seminar, Credits: 02, Enrollment: 7. Talked to students about Insect Ecology in Controlled Environments Program at Wooster. Organized trip to Wooster campus. December 13, 2005.
- The Ohio State University. ATI. HORT TEC T251.** Greenhouse Environmental Control (ATI) Credits: 4, Enrollment: 20 students. Guest Lecture: “IPM in Greenhouses”, 17 November 2005. (Received peer evaluation letter).
- The Ohio State University. ENT 650.** Biological Control. Credits: 5, Enrollment: 9. Guest Lecture: “Biological Control in Confined Environments”, 20 April, 2005.
- The Ohio State University. ATI. HORT TEC T253.** Green House Bedding Plant Production. Credits: 4, Enrollment: 12 students. Guest Lecture: “Greenhouse Insect Pest Control Methods”, 27 January 2007. (Received peer evaluation letter).
- 2004 **The Ohio State University. ENT 462.** Economic Entomology for Turf, Ornamentals, and Greenhouses. Credits: 4, Enrollment: 18. Guest Lecture: “Whitefly Management”, 29 November, 2004.
- The Ohio State University. ENT 880.** Research and Training Seminar, Credits: 02, Enrollment: 7. Talked to students about Insect Ecology in Controlled Environments Program at Wooster. November 23, 2004
- The Ohio State University. ATI. HORT TEC T251.** Greenhouse Environmental Control (ATI) Credits: 4, Enrollment: 18 students. Guest Lecture: “IPM in Greenhouses”, 18 November 2004. (Received peer evaluation letter).

**The Ohio State University. ENT 660.** Advanced Economic Entomology. Credits: 4, Enrollment: 7. Guest Lectures: “Greenhouse IPM” and “Area Wide IPM”, 24 May 2004.

**The Ohio State University. ENT 460.** Economic Entomology and Insect Pest Management. Credits: 5, Enrollment: 20. Guest Lecture: “Managing insect pests of greenhouse crops”, 8 March 2004.

**The Ohio State University. ATL. HORT TEC T253.** Green House Bedding Plant Production (ATI) Credits: 4, Enrollment: 13 students. Guest Lecture: “Greenhouse Insect Pest Control Methods”, 29 January 2004.

Letter of evaluation from Dr. Robert McMahon.

2003 **The Ohio State University. ATL. HORT TEC T251.** Greenhouse Environmental Control (ATI), 23 students. Guest Lecture: “IPM in Greenhouses”, 20 November 2003.

**The Ohio State University. ENT 880.** Research and Training Seminar, Credits: 02, Enrollment: 6. Guest Lecture: Talked to students about Insect Ecology in Controlled Environments Program at Wooster. October 16, 2003.

2002 **University of Arizona.** Tucson, AZ, USA. Participated as full student at a semester long “Workshop on Teaching at the College Level.”

- Objective: to explore the practical applications of teaching/learning theories at the college level.
- Included creation of instructional objectives, syllabus, content organization and assessment of learning. Taught one hour of class.
- Emphasis placed on instructional methodologies, strategies and planning.

**University of Arizona.** Maricopa Agricultural Center, Maricopa, AZ, USA.

- Assisted with Integrated Pest Management Mini-Course (4 hrs per week, 1 credit).
- Topics included: life table analysis and mortality estimation.

1999 **Pan-American College of Agriculture, Zamorano, Honduras.**

Visiting Lecturer, Entomology:

- Lectured during three weeks of classes (3 hrs. per week, 3 credits) as part of the general Entomology course (approx.: 180 students).
- Topics included: insect metamorphosis, ecology and sampling.

**Pan-American College of Agriculture, Zamorano, Honduras.**

Visiting Lecturer, Statistics:

- Lectured during two weeks of classes (3-hrs. class, 1 hr. lab per week, 4 credits) as part of the Agriculture Experimental Design course (approx.: 90 students).
- Topics included: Assumptions of Analysis of Variance, Regression/Correlation and Covariance Analysis.

1993 **Pan-American college of Agriculture, Zamorano, Honduras.**

Adjunct Instructor, Integrated Pest Management:

- Taught the entomology field module at the Crop Protection Department (5 credits).
- Devised syllabus lectured and administered grades. Topics included: sampling techniques, pest identification, action thresholds, pesticide application equipment, and decision-making strategies.

**MENTORING EXPERIENCE:****Graduate Students**

- 2007-  
Current **Claudia Kuniyoshi.** Peru. Seeking PhD in Entomology. The Ohio State University. She started her program during Fall 2007 – Fall 2011. She is being supported by TAs and GRAs. Major advisor.
- 2006-  
Current **Karla Medina.** Honduras. Seeking PhD in Entomology. The Ohio State University. She started her PhD program in spring 2006. She has been supported by GRAs and TAs. March, 2006 – May 2010. Major advisor.
- **Awards:** runner-up award at 55th Annual Meeting of the Entomological Society of America. San Diego, CA, 10 December, 2007. Karla won the award for her display presentation entitled "The amino acid composition of poinsettia cultivars: Effects on whitefly preference and performance."
  - **Grants:** Mechanisms of resistance of poinsettias to the silverleaf whitefly. OARDC-SEEDS, Graduate Student Competition, \$5,870.
- 2004-2007 **Claudia Kuniyoshi.** Peru. Graduated with MS in Entomology. The Ohio State University. She did research on the effect of differential fertilization on top and bottom herbivores on poinsettias. She was supported by TAs and GRAs. September, 2004 – August 2007. She will continue towards her Ph.D. Major advisor.
- **Awards:** runner-up award at 55th Annual Meeting of the Entomological Society of America. San Diego, CA, 10 December, 2007. Claudia won the award for her display presentation entitled "Nutrient-mediated interaction between above- and below-ground herbivores and its effect on the amino acid composition of poinsettias."

**Graduate Students Committee**

- 2008-  
Current **Wilmer Rodriguez.** Honduras. MS student, Department of Horticulture and Crop Sciences, The Ohio State University. August 2008 – December 2010. Major professor: Claudio Pasian.
- 2006-  
Current **Vanessa Muilenburg.** USA. PhD student, Department of Entomology, The Ohio State University. August 2006 – December 2010. Major professor: Dan Herms.
- 2005-  
Current **Rodrigo Chorbadjian.** Chile. PhD candidate, Department of Entomology, The Ohio State University. Major professor: Dan Herms.
- 2008-  
Current **Katie England.** USA. MS student, Department of Entomology, Purdue University. May 2008 – December 2010. Major professor: Cliff Sadof.
- 2007-  
Current **Alfredo Biffi.** Peru. MS student, Department of Food and Agricultural Engineering, Purdue University. August 2007 – December 2009. Major professor: Peter Ling.
- 2006-  
Current **Alejandro Chiriboga.** Ecuador. MS student, Department of Entomology, The Ohio State University. August 2006 – December 2008. Major professor: Dan Herms.
- 2006-  
Current **Elizabeth Erin Morris.** USA. MS student, Department of Entomology, The Ohio State University. August 2006 – December 2008. Major professor: Parwinder Grewal.
- 2005-2006 **Yadwinder Deol.** India. Graduated with MS in Entomology. The Ohio State University. Major professor: Parwinder Grewal.

**Postdoctoral Associates**

2004 **Elizabeth De Nardo.** Brasil. September 15, 2004 – August 15, 2006. 50% of her time split between Parwinder Grewal laboratory. Currently at the College of Wooster working as lecturer.

### Visiting Scholars

**OSU-Zamorano Internship program.** Over the past 4.5 years I have brought 25 students with the idea of recruiting the best to continue towards graduate school. The program is self funded. 77% of the students participating in this program have started graduate studies. See OSU-Zamorano internship metrics at the end of this document.

2008 **Ronald Batallas.** Ecuador. Panamerican College of Agriculture, Honduras. February 14 – December 14, 2008.

2007 **Wilmer Rodriguez.** Honduras. Panamerican College of Agriculture, Honduras. February 12 – August 12, 2008.

**Carolina Sanchez, Colombia.** Has helped with laboratory and greenhouse work. Volunteer. April 16, 2007 – June 30, 2007.

2006 **Henry Paz.** Honduras. Panamerican College of Agriculture, Honduras. February 13, 2006 – May 30, 2007. Pursuing MS in Animal Science at The Ohio State University during fall 2007.

**Eliana Rosales.** Bolivia. Panamerican College of Agriculture, Honduras. February 14, 2006 – March 30, 2006. Pursuing MS in Food Science at the University of Illinois during fall 2007.

2005 **Maria del Carmen Sanchez.** Guatemala. Panamerican College of Agriculture, Honduras. February 14 – December 16, 2005. Currently pursuing MBA in Guatemala.

**Christian Cruz.** Ecuador. Panamerican College of Agriculture, Honduras. February 14, 2005 – March 30, 2006. Pursuing MS in Plant Pathology at The Ohio State University.

2004 **Victoria Caceres,** Panamerican College of Agriculture, Honduras. February 1 – November 5, 2004. Pursuing PhD in Entomology at Purdue University.

**Vanessa Piedra ,** Panamerican College of Agriculture, Honduras. February 16 – August 13, 2004. Currently in Honduras.

**Maria Isabel Cordova,** Panamerican College of Agriculture, Honduras. June 16 – December 16, 2004. Pursuing MBA at INCAE Nicaragua.

### Undergraduates

2008 **Deanna Sindelar,** SU Quarter 2008, senior, Major: Greenhouse Production and Management Technology (ATI), Automated scouting and identification of major insect pests in controlled environments. Collaborative project with Dr. Peter Ling.

**Awards:** Awarded OARDC Research Internship Program scholarship. She will start June 9, 2008.

2005 **Angela Springer,** WI Quarter 2005, senior, Major: Greenhouse Production and Management Technology (ATI), Hort Tec T293 = 1 credit; Identification of major insect pests in controlled environments. Collaborative project with Dr. Robert McMahon (Major advisor).

**Jacob Stockslager**, WI Quarter 2005, senior, Major: Greenhouse Production and Management Technology (ATI), Hort Tec T293 = 1 credit; Management and identification of insects in controlled environments. Collaborative project with Dr. Robert McMahon (Major advisor).

2004 **Rachel Coffman**, WI Quarter 2004, senior, Major: Horticultural Science (ATI), Hort Tec T293 = 1 credit; Hot water treatment for control of spider mites on English Ivy. Collaborative project with Dr. Robert McMahon (Major advisor).

**Roy Reynolds**, Summer Quarter 2004, senior, Major: Greenhouse Production and Management, Floral Design and Marketing (ATI), Hort Tec T293 = 1 credit; Hot water treatment for control of two spotted spider mites in various crops. Collaborative project with Dr. Robert McMahon (Major advisor). Honor for report.

### Undergraduate advising

1999 **Pan-American College of Agriculture**, Zamorano, Honduras.  
Visiting Statistics Advisor: assisted in design of experiments and analysis of projects from 40 students from the B. S. program in the departments of Agronomy, Crop Protection, Horticulture, Animal Science, Natural Resources and Food Technology.

**Pan-American College of Agriculture**, Zamorano, Honduras.  
Thesis committee member for four B. S. students. Alejandra Molina (Crop Protection), Marco Portillo (Horticulture), Fredy Santos (Crop Protection), Claudia Urrutia (Agronomy).

### RESEARCH EXPERIENCE:

Sep 2003- **The Ohio State University**, OARDC, Department of Entomology, Wooster, OH, USA.  
Current Assistant Professor: Insect Ecology in Controlled Environments Program.

- Impact of irrigation and nutrient variation on the population dynamics of fungus gnats and some entomopathogenic nematodes used for their control. Collaborators: Parwinder Grewal (Entomology Department), Ganpati Jagdale (Post-Doc, Entomology Department).
- Impact of plant nutrition on the use of insecticidal soap and hot water for management of the two spotted spider mite. Collaborators: Robert McMahon (ATI, Greenhouse Technology).
- Effect of differential fertilization on the interaction between above, *Bemisia argentifolii* (Hemiptera: Aleyrodidae), and below ground, fungus gnats *Bradysia impatiens* (Diptera: Sciaridae) herbivores on poinsettias. MS Student project: Claudia Kuniyoshi. Finished August 2007.
- Chemical ecology of whiteflies on poinsettias and effects on natural enemies. PhD Student project: Karla Medina. She started spring 2006.
- Short Term CO<sub>2</sub> Exposure and Its Effects on Life History Traits, Dispersion and Management of Selected Insect Pests and Their Natural Enemies. Collaborators: Dr. Peter Ling (Food, Agriculture, and Environmental Engineering).
- Soil health impact on tomato plant defenses against whiteflies. Collaborators: Saskia Hogenhout, Casey Hoy, Deb Stinner, Larry Phelan (Entomology).

2000-2003 **University of Arizona**, Maricopa Agricultural Center, Maricopa, AZ, USA. Research Associate:

- Current project (Supervising crew of 7 people): "Seasonal and overwintering ecology of the sweetpotato whitefly, *Bemisia tabaci*, in Arizona".

- Objective: to identify and quantify the mortality factors affecting the whitefly populations on different hosts at different locations throughout the year.
- Development and utilization of different techniques for whitefly population monitoring including the use of life table analysis.

1996-2000 **Purdue University**, West Lafayette, IN, USA.

Research Assistant:

- Assisted in foreign exploration project to discover new natural enemies for control of the Colorado potato beetle.
- Conducted PhD dissertation research on *Leptinotarsa-Solanum*-natural enemy interactions.

1994-1996 **Purdue University**, West Lafayette, IN, USA.

Research Assistant:

- Assisted in biological control laboratory and field projects, including development of literature and insect collection databases and laboratory web page
- Conducted MS thesis research on conservation biological control of fall armyworm in maize.

1991-1993 **Pan-American College of Agriculture**, Zamorano, Honduras.

Research Assistant and Pest Control Advisor (150 Ha):

- Monitoring and control of crop pests in corn, sorghum, beans and soybeans.
- Conducted BS thesis research of fall armyworm on grain sorghum.

### **FUNDING HISTORY (Started with OARDC on 2003):**

<b>Investigator(s)</b>	<b>Title</b>	<b>Sponsor</b>	<b>Funding Period</b>	<b>Funded amount</b>
<b>Total</b>				<b>\$407,995</b>
<b>Extramural</b>				<b>\$349,419</b>
<u>Expired:</u>				\$234,326
L. A. Cañas, T. Ebbert, R. Downer, R. Lindquist	Improved Application Technology For Pest Control And Bioregulating Agents	USDA-ARS Cooperative Agreement	08/00 to 08/05	\$111,800
C.S. Sadof et. al. (8 PDs including LAC)	Using Geographic Information Systems to Enhance Phytosanitary Conditions and Trade Capacity of Small Growers of Tropical Ornamental Crops	USAID-FAS	10/05 to 09/06	\$15,000
L. A. Cañas, C. Welty.	Entomology Teaching Collection	CBS-Instructional Activities, OSU	06/05 to 06/06	\$2,164
L. A. Cañas	Efficacy of various chemistries to control pests in ornamental plants	OHP, Valent, Arysta Life Sciences, Dupont, Cleary	01/05 to 12/06	\$45,750
L. A. Cañas	The IR4 Project (Ornamentals)	Evaluation of Different Chemistries for Managing Thrips.	01/06 - 12/06	\$15,000

Investigator(s)	Title	Sponsor	Funding Period	Funded amount
L. A. Cañas, P. Ling and J. Frantz	Effect of CO <sub>2</sub> Enrichment, Light and Nutrients on Plant-Herbivore Performance and Impact on Pest Management Practices	OH-IPM program	05/06 to 1/07	\$9,000
L. A. Cañas, P. Ling, M. Jones.	Management of silverleaf whitefly and western flower thrips using the natural enemies <i>Encarsia formosa</i> and <i>Amblyseius swirskii</i> on petunia plants exhibiting differential ethylene sensitivity.	OH-IPM program	07/07 to 1/08	\$4,500
L. A. Cañas, and P. Ling.	Implementing and improving the use of biological control to manage pests affecting crops grown hydroponically.	Hydroponics Program	07/07 to 1/08	\$6,912
L. A. Cañas	The IR4 Project (Ornamentals)	Evaluation of Different Chemistries for Managing Thrips on flowers.	01/07 - 12/07	\$8,000
L. A. Cañas	Efficacy of various chemistries to control pests in ornamental plants	OHP, Valent, Gowan, Nufarm	01/07 to 02/08	\$16,200
<u>Active:</u>				\$173,669
L. A. Cañas, D. Herms, T. Blaine	Assessment and Optimization of Pest Management Practices Used on Ornamentals in Ohio.	Ohio Nursery and Landscape Association, Inc.	01/06 - 12/08	\$20,000
L. A. Cañas	Development of a novel nematode release system for preventive management of the fungus gnat <i>Bradysia difformis</i> in ornamentals.	OARDC-SEEDS Small Industry Grants Program.	07/08 to 1/09	\$12,000
L. A. Cañas, K. J. Medina.	Whitefly preference for poinsettia cultivars: impact of plant host traits on whitefly development, survival and fecundity.	American Flower Endowment	05/08 -05/10	\$48,049
L. A. Cañas	Efficacy of Selected Bioinsecticides for Control of Whiteflies and Western Flower Thrips on Greenhouse Tomatoes.	USDA-CSREES-IR4 biopesticides	07/08 to 07/09	\$27,920

Investigator(s)	Title	Sponsor	Funding Period	Funded amount
L. A. Cañas	Efficacy of various chemistries to control pests in ornamental plants	Bayer, Dow.	07/08 to 02/09	\$18,200
L. A. Cañas	Using biological control to manage aphids (Homoptera: Aphididae) on hydroponic lettuce.	OARDC-SEEDS Small Industry Grants Program.	07/08 to 2/09	\$12,000
L. A. Cañas	Assessment of a biological control management program for whiteflies on poinsettias: population trends, variety preference and economics.	OARDC-SEEDS Small Industry Grants Program.	07/08 to 1/09	\$12,000
L. A. Cañas, C. Pasian	The IR4 Project (Ornamentals)	Evaluation of phytotoxicity of QRD416 on various ornamentals.	07/08 - 12/08	\$7,000
C. Pasian , L. A. Cañas, B. Fausey.	2007-2008 Floriculture Industry Roundtable of Ohio Team Support Proposal to the AFE	American Flower Endowment and OFA.	01/08 - 12/11	\$16,500
<b>Pending:</b>				\$1,141,432
S. E. Burnett, P. Thomas, J. Williams-Woodward, L. A. Cañas C. Pasian	Development of Interactive DVDs to Integrate Extension Diagnostics and Experiential Learning for Rapid Diagnosis of Greenhouse Physiological, Plant Pathological, and Entomological Problems.	USDA-CSREES-HEC	9/08 - 9/11	\$264,867
P. L. Phelan D. Francis, L. A. Cañas, S. Hogenhout, D. Herms	Integrated functional genomics to study the modulation of aboveground insect herbivores and phytopathogens by belowground microbiota.	USDA-CSREES-NRI	9/08 - 08/11	\$427,572
M. Solensky, L. A. Cañas	Tri-trophic interactions between parasitoids, hosts and host plants.	USDA-CSREES-NRI	9/08 - 08/11	\$390,848
M. Jones, L. A. Cañas, P. Ling.	Novel Approaches to Insect Management: Determining Ethylene's Role in Plant-Insect Interactions.	American Flower Endowment	09/09 -12/11	\$58,145

**PUBLICATION / PAPERS:****Peer reviewed (10 total), editor reviewed\* (7)**

**Cañas, Luis, Robert McMahon, Mildred Casey, Robin Taylor, Richard Lindquist, Terry Moore, and Jamie Hoy.** Hot Water Drenches for the Control of Fungus Gnat Infestations of New Guinea Impatiens and Poinsettia Potting Media. Will be submitted to HortTechnology on December, 2008.

**Cañas, Luis A., Peter C. Ellsworth, Steven E. Naranjo, Nuris M. Acosta.** Seasonal ecology of whiteflies in Arizona. Will be submitted to Entomologia Experimentalis Et Applicata on December, 2008.

2008-09 **Kuniyoshi, C. H., Cañas, L. A., Phelan, P. L.** Effect Of Differential Fertilization On The Interaction Between Above, *Bemisia tabaci* (= *B. argentifolii*) (Hemiptera: Aleyrodidae), And Below Ground, Fungus Gnats *Bradysia Impatiens* (= *B. difformis*). (Diptera: Sciaridae), Herbivores On Poinsettias. Will be submitted to Environmental Entomology on November, 2008.

**Ranger, C. M., A. P. Singh, L. A. Cañas, J. M. Frantz, J. C. Locke, M. E. Reding and N. Vorsa. 2008.** Influence of Soluble Silicon on Resistance of *Zinnia elegans* to the Green Peach Aphid *Myzus persicae* (Hemiptera: Aphididae). Accepted to Environmental Entomology in August, 2008.

**Acosta, N.M., & Cañas, L. 2008.** Biological Control of Insect Pests in Greenhouse Vegetables. OSU fact sheet. Submitted for internal review.

**Patricio Gallegos, César Asaquibay, Sandra Garcés, Franklin Mayguashca, Mario Freire, Roger N. Williams, Nuris M. Acosta, Michael A. Ellis, Luis Cañas. 2007.** Evaluación de productos de baja toxicidad como forma de manejo de *Premnotrypes vorax*, en Ecuador (Evaluation of low toxicity products for management of *Premnotrypes vorax* in Ecuador). Submitted to Arthropod Management Tests.

**\*Naranjo, S.E., Ellsworth, P.C., & Cañas, L. 2008.** Mortality and population dynamics of *Bemisia tabaci* within a multi-crop system. *Journal of Insect Science*, 8, 37-37

2007 **Ganpati B. Jagdale, Mildred L. Casey, Luis Cañas and Parwinder S. Grewal. 2007.** Comparison of efficacy of warm and cold adapted species of entomopathogenic nematodes against fungus gnat, *Bradysia impatiens* (= *B. difformis*) (Diptera: Sciaridae). *Biological Control* 43: 23–30.

**\*L. A. Cañas, N. Acosta. 2007.** GERBERA, *Gerbera jamesonii* L. 'Festival Dark Eye Golden Yellow' EFFICACY OF SEVERAL PRODUCTS FOR MANAGING WESTERN FLOWER THRIPS, 2006. *Arthropod Management Tests* 32: G43.

**\*L. A. Cañas, N. Acosta. 2007.** TOMATO, *Lycopersicon esculentum* L. 'Roma' EFFICACY OF SELECTED INSECTICIDES FOR CONTROL OF WHITEFLIES ON GREENHOUSE TOMATOES, 2005. *Arthropod Management Tests* 32: E50.

**\*L. A. Cañas, N. Acosta. 2007.** GERANIUM: *Pelargonium hortorum* L.H. Bailey, 'Bandit Coral' CONTROL OF CITRUS MEALYBUG WITH SELECTED NEONICOTINOIDS ON GERANIUMS, 2005. *Arthropod Management Tests* 32: G42.

**\*N. Acosta, C. Hoy, M. J. Dunlap, L. A. Cañas, M. F. A. Jallow. 2007.** CABBAGE, *Brassica oleracea* L. var. *Capitata* 'Blue ventage' EFFICACY OF SELECTED INSECTICIDES ON FLEA BEETLES, 2006. *Arthropod Management Tests* 32: E4.

- 2006 **Deol, Y. S., Grewal, S. K., Canas, L., Yenik, M. & Grewal, P. S. 2006.** An assessment of entomopathogenic nematode delivery through a commercial potting medium and a garden soil. *Int. J. Nematol.* 16, 186-193.
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- 2003 **Rodriguez-Saona, C., Steven J. Crafts-Brandner, and Luis A. Cañas.** Volatile Emissions Triggered By Multiple Herbivore Damage: Beet Armyworm And Whitefly Feeding On Cotton Plants. *Journal of Chemical Ecology*, 29: 2539-2550. November 2003
- 2002 **Cañas L. A., Robert J. O'Neil and Timothy J. Gibb. 2002.** Population ecology of *Leptinotarsa undecimlineata* Stål (Coleoptera: Chrysomelidae): population dynamics, mortality factors, and potential natural enemies for biological control of the Colorado potato beetle. *Biological Control*, 24: 50-64.
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**Cañas, L. A., P. Ling, and J. Frantz. 2007.** Effect of CO<sub>2</sub> Enrichment, Light, and Nutrients on Plant-Herbivore Performance and Impact on Pest-Management Practices, pp. 66-71. In Ohio State Integrated Pest Management Grants Program Reports 2005-2006. J. Kovach and A. Sundermeier, editors. Ohio Integrated Pest Management. Wooster, Ohio.

**Cañas, L. A., and C. H. Kuniyoshi. 2007.** Irrigation and Nutrition: Their Effect on Insect Populations. Ohio Florist Association Newsletter. July-August issue.

**Cañas, L. A. 2007.** Floriculture Industry Roundtable of Ohio (FIROO). June 15, 2007, Vol. 13 #6. Contribution to electronic newsletter: "Broad mites."

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**Evans, Willi., L. A. Cañas 2007.** Use of Insecticidal Soap. Interview of Dr. Luis Cañas for Organic Gardening Magazine.

**Cañas, L. A. 2007.** Pesticide application tips: back to basics. American Nurseryman Magazine.

**Cañas, L. A. 2007.** Insecticidal Soaps. Resource: Northwest Ohio's monthly floriculture newsletter. 3: 4.

**Cañas, L. A. 2007.** Floriculture Industry Roundtable of Ohio (FIROO). March 23, 2007, Vol. 13 #2. Contribution to electronic newsletter: "Thrips management."

2006

**Cañas, L. A. 2006.** Floriculture Industry Roundtable of Ohio (FIROO). December 11, 2006, Vol. 12 #10. Contribution to electronic newsletter: "Whitefly preference for poinsettias and effects of irrigation and fertilization on pest management methods."

**Cañas, L. A. 2006.** Florida Fern Caterpillar. FloriBytes vol 1 issue 6. October 2006.

**Cañas, L. A. 2006.** Floriculture Industry Roundtable of Ohio (FIROO). November 17, 2006, Vol. 12 #9. Contribution to electronic newsletter: "Fern caterpillar management."

**Cañas, L. A. 2006.** Now that I have my poinsettias in color, what can I use to control whiteflies? FloriBytes vol 1 issue 4. October 2006.

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**Cañas, L. A. and R. Cloyd 2006.** IR4 and grower needs. FIROO Bytes vol 1 issue 3. October 2006.

**Cañas, L. A., and R. Cloyd. 2006.** Whitefly Identification and Management. Resource: Northwest Ohio's monthly floriculture newsletter. October issue, p 6-7.

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**Cañas, L. A. and R. Cloyd 2006.** Whitefly and leafroller identification and management. FIROO Bytes vol 1 issue 2. September 2006.

**Cañas, L. A. 2006.** Thrips and whitefly management. FIROO Bytes vol 1 issue 1. September 2006.

**Cañas, L. A. 2006.** CD-ROM Produced by the Ohio Florist Association. The Grower's Cutting Edge: Part 1. July 9, 2006. Ohio Florist Association National Meeting.

**Cañas, L. A. 2006.** CD-ROM Produced by the Ohio Florist Association. M to W (Mites, Scales, Thrips, and Whiteflies). July 9, 2006. Ohio Florist Association National Meeting.

**Cañas, L. A. 2006.** CD-ROM Produced by the Ohio Florist Association. Pesticide Application Tips and Programs. July 8, 2006.

**Cañas, L. A. 2006.** Floriculture Industry Roundtable of Ohio (FIROO). September 22, 2006, Vol. 12 #7. Contribution to electronic newsletter: "Sampling with sticky cards."

**Cañas, L. A. 2006.** Floriculture Industry Roundtable of Ohio (FIROO). September 8, 2006, Vol. 12 #6. Contribution to electronic newsletter: "Thrips management update and IR4 program results."

**Cañas, L. A. 2006.** Floriculture Industry Roundtable of Ohio (FIROO). June 16, 2006, Vol. 12 #5. Contribution to electronic newsletter: "Aphids and Thrips management update."

**Cañas, L. A. 2006.** Floriculture Industry Roundtable of Ohio (FIROO). May 26, 2006, Vol. 12 #4. Contribution to electronic newsletter: "Aphids and Thrips control and status of whitefly biotype Q in Ohio."

2005

**Cañas, L. A., 2005.** The Q-biotype Whitefly: A "new" whitefly in the USA. Northwest Ohio's Commercial Floriculture Resource. December issue, p 4.

**Cañas L. A. 2005.** A live bug is not always a bad bug! How to add biological control agents to your current management program. Ohio Florist Association Newsletter. Accepted for publication.

**Cañas, L. A., 2005.** Whitefly biotype Q in the US? What does it mean and how to be prepared. Ohio Floriculture Online. Volume 12, Issue 4:  
<http://floriculture.osu.edu/archive/may05/WhiteFlyQ.html>

**Dave Dyke, Claudio Pasian, Peter Konjoian, Michelle Jones, Peter Ling, and Luis Cañas. 2005.** "Extension reloaded," extension tours with commercial clientele: taking university and grower cooperation to a whole new level. Ohio Florist Association Newsletter. July-August issue.

**Roll, D., C. Pasian, T. Heston, J. Mortensen, S. Nameth, J. Chatfield, L. A. Cañas.** Greenhouse Pest Control, Category 6d: Study Guide for Commercial Applicators. Ohio Department of Agriculture. Accepted for publication.

**Cañas, L. A., 2005.** Do not be caught off guard! Information is key to prevent mites and mealybug problems. Ohio Florist Association Newsletter. March-April issue.

**Floriculture Industry Roundtable of Ohio (FIROO).** May 13, 2005, Vol. 11 #5. Contribution to electronic newsletter: "Pest control at butterfly house."

**Floriculture Industry Roundtable of Ohio (FIROO).** June 3, 2005, Vol. 11 #6. Contribution to electronic newsletter: "Whitefly biotype Q, establishment of TAC force."

**Floriculture Industry Roundtable of Ohio (FIROO).** June 3, 2005. Contribution to FIROO bytes: "Pink hibiscus mealybug and whitefly biotype Q."

**Floriculture Industry Roundtable of Ohio (FIROO).** September 23, 2005, Vol. 11 #9. Contribution to electronic newsletter: "Leafminers on chrysanthemums and broad mites on Celosia."

**Floriculture Industry Roundtable of Ohio (FIROO).** November 18, 2005, Vol. 11 #11. Contribution to electronic newsletter: "Whitefly biotype Q management and current status."

**Floriculture Industry Roundtable of Ohio (FIROO).** December 3, 2005, Vol. 11 #12. Contribution to electronic newsletter: "Efficacy of various insecticides against the whitefly biotype Q and slug management."

**CD-ROM Produced by the Society of American Florists 21st Annual Conference on Pest Management for Ornamentals. Winning against whiteflies.** February 19, 2005.

**CD-ROM Produced by the Ohio Florist Association. Greenhouse pesticide application programs. Ohio Florist Association National Meeting.** July 12, 2005.

2004

**Cañas, L. A., 2004.** Why should we care about insecticide resistance and what to do about it? Ohio Floriculture Online. Volume 11; Issue 1; February 2004 <http://floriculture.osu.edu/InsectResistance.html>

**Cañas, L. A., 2004.** Insect Update: Fungus Gnats. Ohio Floriculture Online. Volume 11; Issue 2; March 2004 <http://floriculture.osu.edu/InsectResistance.html>

**Cañas, L. A., 2004.** Insect Update: Aphids and their control. Ohio Floriculture Online. Volume 11; Issue 5; June 2004 <http://floriculture.osu.edu/InsectUpdateApr04.html>

**Floriculture Industry Roundtable of Ohio (FIROO).** March 12, 2004, Vol. 10 #3. Contribution to electronic newsletter: "Status of management for fungus gnat, shore fly, green peach aphid, and cotton aphid."

**Floriculture Industry Roundtable of Ohio (FIROO).** March 26, 2004, Vol. 10 #4. Contribution to electronic newsletter: "Sampling is key for whitefly management in ornamentals and vegetables."

**Floriculture Industry Roundtable of Ohio (FIROO).** April 9, 2004, Vol. 10 #5. Contribution to electronic newsletter: "Infestations by green peach aphid on lantana, cotton aphid on Hybiscus, and two spotted spider mites on Phormium".

**Floriculture Industry Roundtable of Ohio (FIROO).** April 23, 2004, Vol. 10 #6. Contribution to electronic newsletter: "Infestations of Broad and Cyclamen mites on hanging baskets."

**Floriculture Industry Roundtable of Ohio (FIROO).** May 7, 2004, Vol. 10 #7. Contribution to electronic newsletter

**Floriculture Industry Roundtable of Ohio (FIROO).** July 13, 2004, Vol. 10 #11. Contribution to electronic newsletter.

**Floriculture Industry Roundtable of Ohio (FIROO).** August 20, 2004, Vol. 10 #12. Contribution to electronic newsletter.

**Floriculture Industry Roundtable of Ohio (FIROO).** October 1, 2004, Vol. 10 #13. Contribution to electronic newsletter: "Bandedwinged whiteflies and thrips."

**Floriculture Industry Roundtable of Ohio (FIROO).** October 22, 2004, Vol. 10 #14. Contribution to electronic newsletter: "Whitefly biotype Q and resistance to neonicotinoids."

**Floriculture Industry Roundtable of Ohio (FIROO).** December 3, 2004, Vol. 10 #16. Contribution to electronic newsletter: "Current management options for mites."

**Naranjo, S. E, Luis A. Cañas and P. C. Ellsworth. 2004.** (English Translation by Luis Cañas) Mortality Factors Affecting Populations of Sweetpotato Whitefly, *Bemisia tabaci*, in a Multi-Crop System.

<http://cals.arizona.edu/crops/cotton/insects/wf/horticultura0204.html>

2003 **Jasinski, J. M. Bennett, J. Felix, B. Prechur, C. Hoy, M. Huelsman, C. Welty, L. Cañas, L. Harper, J. Kick-Raack, S. Miller, J. Cunningham, R. danhoff, J. Stearns, W. Wickerham, B. Vantil, D. Roll, T. Sachs.** Bell Pepper and Non-Bell Pepper Pest Management Strategic Plan. The Ohio State University, Integrated Pest Management Program. December 1, 2003.

2002 **Canas, L., S. E. Naranjo, and P. C. Ellsworth.** Seasonal ecology of *Bemisia tabaci* in Arizona: Low temperature and host plant effects on field populations and associated mortality factors. Silverleaf Whitefly National Research, Action, and Technology Transfer Plan: Fourth Annual Review of the Second 5-Year Plan and Final Report for 1992-2002. U.S. Dept. Agric., Agric. Res. Serv. June 2002.

2000 **Cañas L. A. 2000.** Population ecology of *Leptinotarsa undecimlineata* Stal (Coleoptera: Chrysomelidae) and their effects on *Solanum lanceolatum* Cav in Honduras. Thesis Ph. D., Purdue University, West Lafayette, IN, USA.

1996 **Cañas, L. A. 1996.** Response of natural enemies to sugar applications in maize and their effect on fall armyworm *Spodoptera frugiperda* (J.E. Smith) populations in Honduras. Thesis MS, Purdue University, West Lafayette, IN, USA.

1993 **Cañas, L. A. 1993.** Evaluación técnico-económica de diferentes niveles críticos para el control de *Spodoptera frugiperda* (Smith) en sorgo para grano. Tesis de Ingeniería Agronómica, El Zamorano, Honduras.

#### **Publication in international magazines (1 total)**

2004 **Steven E. Naranjo, Luis A. Cañas and Peter C. Ellsworth.** 2/2004. Mortalidad de *Bemisia tabaci* en un sistema de cultivos múltiples. Horticultura Internacional. pp. 14-21. (Requested submission)

#### **Books (1 total)**

2000 **O'Neil, R. J. and L. Cañas. 2000.** Attracting ants (p. 98). Contribution to the book, "Natural crop protection practices in the Tropics". G. Stoll (ed.). Verlag Pub., Wickersheim, Germany.

### **RESEARCH AND EXTENSION PRESENTATIONS:**

#### **Research presentations (53 National and 5 International\*\*; presenter\*; people reached = 1,628)**

2008 **Medina-Ortega\*, K. J. and Cañas, L. A.** "Amino acid composition of poinsettia cultivars: effects on whitefly preference." OARDC Conference. Poster Presentation. Wooster, OH. April 17, 2008.

**Medina-Ortega\*, K.J. and Cañas, L.A.** “The Amino Acid Composition of Poinsettia Cultivars: Effect on Silverleaf Whitefly Life History.” NCB-ESA meeting. Columbus, OH. March 25, 2008.

**Cañas, L.A.\*.** “Pesticide Use.” Spanish Educational Program: Pest Identification and Management. Heartland Growers. Indianapolis, IN. January 17, 2008. Attendance = 10.

**Cañas, L.A.\*.** “Problem detection: identification and sampling.” Spanish Educational Program: Pest Identification and Management. Heartland Growers. Indianapolis, IN. January 16, 2008. Attendance = 10.

**Cañas, L.A.\*.** “Alternate tactics beside pesticide use.” Spanish Educational Program: Pest Identification and Management. Heartland Growers. Indianapolis, IN. January 16, 2008. Attendance = 10.

2007

**Phelan\*, P. L., S. A. Hogenhout, and L. A. Cañas.** Functional genomics to study the modulation of aboveground insect herbivores and phytopathogens by belowground microbiota. 55th Annual Meeting of the Entomological Society of America. San Diego, CA, 12 December, 2007. Attendance = 21.

**Christopher M. Ranger\*, Luis A. Cañas, Jonathan Frantz, James Locke and Michael Reding.** Silicon-inducible defenses of *Zinnia elegans* against *Myzus persicae*. December, 2007. Entomological Society of America National Meeting. Number of participants = 31 people. Invited Speaker, oral presentation, San Diego, CA. (Invited Presentation).

**Medina-Ortega\* K. J., L. A. Cañas.** The amino acid composition of poinsettia cultivars: Effects on whitefly preference and performance. Display presentation. 55th Annual Meeting of the Entomological Society of America. San Diego, CA, 10 December, 2007.

**Kuniyoshi\*, C. H., L. A. Cañas, and P. L. Phelan.** Nutrient mediated interaction between above- and below-ground herbivores and its effect on the amino acid composition of poinsettias. Display presentation. 55th Annual Meeting of the Entomological Society of America. San Diego, CA, 10 December, 2007.

**Luis A. Cañas\*.** The road less traveled: taking an ecological approach to improve pest management in controlled environments. September 21, 2007. Rutgers – Approximate number of participants = 27 people. Discussed results of current research in my lab at OARDC. New Brunswick, NJ. (Invited Presentation).

**Claudio Pasian, Luis A. Cañas\*, Peter Ling.** Extension Reloaded: Detecting Insect Problems and Management. July 14, 2007. Ohio Florist Association National Meeting. Number of participants = 108 people. Discussed management options for major insect groups attacking ornamental and vegetable plants grown in greenhouses. Invited Speaker, oral presentation, Columbus, OH. (Invited Presentation).

**Luis A. Cañas\*.** Factors affecting plant-herbivore interactions and pest management in controlled environments: can an ecological approach give us the edge? April 27, 2006. University of Kentucky – Approximate number of participants = 43 people. Discussed results of current research in my lab at OARDC. Lexington, KY. (Invited Presentation).

**Kuniyoshi, C. H., L. A. Cañas\*, and P. L. Phelan.** Can fungus gnat attack on poinsettias exacerbate whitefly problems? 55th Annual Meeting of the Entomological Society of America. San Diego, CA, 9 December, 2007. Attendance = 44.

**Ranger\*, C. M., L. Cañas, R. Derksen, J. Locke, M. Reding and C. Krause.**

**2007.** Comparison of insecticide delivery strategies for controlling the silverleaf whitefly on poinsettia. March 6, 2007. USDA Application Technology Workshop. Toledo, OH. Attendance = 38.

**\*\*Luis A. Cañas\*, Ganpati B. Jagdale and Parwinder S. Grewal.** Factors Affecting the Use of Nematodes as Biocontrol Agents against Fungus Gnats in Greenhouses. Talk presented at Symposium: Biological Control. Entomological Society of America, North Central Branch Annual Meeting. March 27, Winnipeg, Manitoba, Canada. (Invited Presentation). Attendance = 57.

**\*\* Luis A. Cañas\* Vanda Bueno.** Status of Biocontrol of Protected Crop Pests in Mexico and Central and South America. Talk presented at Symposium: Biological Control Without Borders. International Organization for Biological Control Meeting. November 15, 2007 Merida, Cancun, Mexico. (Invited Presentation). Attendance = 53.

2006

**\*\* Luis A. Cañas\*.** Pasos para el diseño de un programa de muestreo: El caso de la mosca blanca. (Steps to design a sampling program: the whitefly case). March 13, 2006. Workshop: Sampling protocols for detection of mealybugs on *Alpinia* in the Atlantic Coast of Costa Rica. Number of participants = 48 people. Part of team that developed IPM program for mealybug management on *Alpinia*. Guapiles, Costa Rica. (Invited Presentation).

**Luis A. Cañas\*.** Impact of Fertilization and Soil Moisture on Insect Pest Management in Greenhouse Grown Ornamentals. December 12, 2006. Entomological Society of America National Meeting. Presented results about different studies documenting the impact of fertilization and irrigation on pest management practices. Poster presentation, Indianapolis, IN. Submitted presentation.

**Karla Medina\*, and Luis A. Cañas.** Poinsettia (*Euphorbia pulcherrima*) cultivar-mediated suitability to *Bemisia tabaci* (biotype B) (Hemiptera: Aleyrodidae) and impact on *B. tabaci* life history traits. December 11, 2006. Entomological Society of America National Meeting. Presented results about whitefly preferences for different poinsettia varieties. PhD Student Competition, poster presentation, Indianapolis, IN. Attendance = 22

**Claudia Kuniyoshi\*, Luis A. Cañas, Larry Phelan, Dan Herms, Dave Horn.** Nutrient-mediated interaction between above- and below-ground herbivores of poinsettias. December 11, 2006. Entomological Society of America National Meeting. Number of participants = 26 people. Presented results of Claudia Kuniyoshi's Master's Program. MS Student Competition, oral presentation, Indianapolis, IN. Attendance = 23.

**Clifford S. Sadof, Carlos Bográn and Luis A. Cañas\*.** Working with offshore ornamental producers to keep exotic pests overseas. December 10, 2006. Entomological Society of America National Meeting. Number of participants = 53 people. Presented results of project developed in Costa Rica to sample and manage mealybugs on *Alpinia*. Invited Speaker, oral presentation, Indianapolis, IN. (Invited Presentation).

**Luis A. Cañas\*.** The Grower's Cutting Edge: Part 1. July 9, 2006. Ohio Florist Association National Meeting. Number of participants = 64 people. Presented results of current research. Invited Speaker, oral presentation, Columbus, OH. (43 evaluations submitted, average = 5.16/7; (Invited Presentation).

**Luis A. Cañas\***. M to W (Mites, Scales, Thrips, and Whiteflies). July 9, 2006. Ohio Florist Association National Meeting. Number of participants = 178 people. Presented the most current information about handling insect pests in greenhouses. Invited Speaker, oral presentation, Columbus, OH. (121 evaluations submitted, average = 6.22/7; (Invited Presentation).

**Luis A. Cañas\***. Pesticide Application Tips and Programs. July 8, 2006. Ohio Florist Association National Meeting. Number of participants = 76 people. Discussed tips to improve pesticide application success. Invited Speaker, oral presentation, Columbus, OH. (57 evaluations submitted, average = 5.84/7; (Invited Presentation).

**Claudio Pasian, Luis A. Cañas\*, Peter Ling**. Extension Reloaded: Detecting Insect Problems and Management. July 8, 2006. Ohio Florist Association National Meeting. Number of participants = 52 people. Discussed management options for major insect groups attacking ornamental and vegetable plants grown in greenhouses. Invited Speaker, oral presentation, Columbus, OH. (Invited Presentation).

**Luis A. Cañas\***. Plant nutrition and irrigation effects on plant-herbivore interactions and pest management in controlled environments. March 17, 2006. Penn State University – Approximate number of participants = 23 people. Discussed results of current research in my lab at OARDC. University Park, PA. (Invited Presentation).

**Luis A. Cañas\***. Insect Ecology in Controlled Environments. January 26, 2006. College of Wooster – Coordinated by Marilyn Loveless. Approximate number of participants = 54 people. Discussed potential options for applied research at OARDC, Wooster, OH. (Invited Presentation).

2005

**Luis A. Cañas\***. Winning against whiteflies. February 19, 2005. Society of American Florists – Coordinated by Christine Casey. Approximate number of participants = 100 people. Discussed identification techniques and key characteristics of whiteflies and management techniques, oral presentation, Orlando, FL. (Invited Presentation). (Evaluation, 44 responses, overall average = 8.70/10.0).

**Luis A. Cañas\*, June 14, 2005**. Natural enemy release. Midwest Institute for Biological Control Workshop: Techniques for Evaluating Natural Enemies. Number of participants = 10 people. Invited Speaker, oral presentation, Wooster, OH.

**Luis A. Cañas\*, June 15, 2005**. Life tables and their use to evaluate natural enemy effects. Midwest Institute for Biological Control Workshop: Techniques for Evaluating Natural Enemies. Number of participants = 10 people. Invited Speaker, oral presentation, Wooster, OH.

**Luis A. Cañas\*, June 15, 2005**. Life table laboratory: Insect assessment and life table construction and evaluation. Midwest Institute for Biological Control Workshop: Techniques for Evaluating Natural Enemies. Number of participants = 10 people. Invited Speaker, oral presentation, Wooster, OH.

**Luis A. Cañas\*, June 15, 2005**. Sampling natural enemies. Midwest Institute for Biological Control Workshop: Techniques for Evaluating Natural Enemies. Number of participants = 10 people. Invited Speaker, oral presentation, Wooster, OH.

**Raymond Cloyd, Luis A. Cañas, Richard Derksen**. Insect & Pest Management: The Whole Nine Yards. July 9, 2005. Ohio Florist Association National Meeting. Number of participants = 58 people. Discussed management options for whiteflies, aphids and mites. Invited Speaker, oral presentation, Columbus, OH. (46 evaluations submitted, average = 6.2/7). (Invited Presentation).

**Claudio Pasian, Luis A. Cañas\*, Peter Ling.** Extension Reloaded: Detecting Insect Problems and Management. July 9, 2005. Ohio Florist Association National Meeting. Number of participants = 61 people. Discussed management options for major insect groups attacking ornamental and vegetable plants grown in greenhouses. Invited Speaker, oral presentation, Columbus, OH. (Invited Presentation).

**Luis A. Cañas\*, Richard Derksen, Justin Marotta.** Greenhouse Pesticide Application Programs. July 12, 2005. Ohio Florist Association National Meeting. Number of participants = 115 people. Discussed current research on appropriate spraying volume and factors affecting spray success. Invited Speaker, oral presentation, Columbus, OH. (65 evaluations submitted, average = 6.2/7). (Invited Presentation).

**Luis A. Cañas\*.** Ornamental Trials: Insect Preferences 2004. August 2, 2005. The Ohio State Univ/Ohio Florist Association National Trials. Number of participants = 68 people. Presented results about variety susceptibility to spider mites. Invited Speaker, oral presentation, Columbus, OH. (Invited Presentation).

**Luis A. Cañas\*.** Efficacy of Celero and Shuttle to manage insect pests in greenhouses. October 18, 2005. Arysta National Ornamental Meeting. Number of participants = 26 people. Discussed efficacy of Celero and Shuttle against various pests attacking ornamentals in greenhouses. Invited Speaker, oral presentation, Fort Lauderdale, FL. (Invited Presentation).

**Luis A. Cañas\*.** Environment and plant nutrition: Two overlooked components affecting insect populations in greenhouses. December 15, 2005. Entomological Society of America National Meeting. Number of participants = 61 people. Presented results about the effect of differential nutrition on the use of hot water and insecticidal soap to manage spider mites on Neantabella palms. Invited Speaker, oral presentation, Fort Lauderdale, FL. (Invited Presentation).

2004 **Luis A. Cañas\*, Parwinder Grewal, Ganpati Jagdale.** 2004. Effects of nematode biological control on the life history of fungus gnats. Entomological Society of America National Meeting. Salt Lake City, Utah. November 14, 2004. (Invited Presentation). Attendance = 46.

**\*\*Luis A. Cañas, Steven E. Naranjo\* and Peter C. Ellsworth.** Mortality Factors Affecting Populations of Sweetpotato Whitefly, *Bemisia tabaci*, in a Multi-Host System. Poster presentation at XXII International Congress of Entomology. Brisbane, Queensland, Australia. 15-12 August 2004. (Contributed Presentation).

2003 Luis A. Cañas\*, Steven E. Naranjo and Peter C. Ellsworth. Using Insect Biodemography to Determine Critical Elements in the Population Ecology and management of a pest in a multicrop system. **Poster presentation at Entomological Society of America National Conference.** Cincinnati, Ohio.

Luis A. Cañas\*, Peter C. Ellsworth and Steven E. Naranjo. Natural Whitefly Mortality: Recent Advances and Their Implication for Whitefly Management. **Invited Speaker, oral presentation, Cotton Extension Meeting, Maricopa Agricultural Center,** Maricopa, Arizona (8-26-03). Attendance = 18.

Luis A. Cañas\*, Peter C. Ellsworth and Steven E. Naranjo. Natural Whitefly Mortality: Recent Advances and Their Implication for Whitefly Management. **Invited Speaker, oral presentation, Cotton Extension Meeting, Marana Agricultural Center,** Marana, Arizona (8-27-03). Attendance = 23.

- Luis A. Cañas\*, Steven E. Naranjo, and Peter C. Ellsworth. Host plant and temperature effects on whitefly seasonal population ecology in Arizona and relationship with associated natural enemies. **Invited Speaker, oral presentation, tritrophic interactions symposium. Entomological Society of America, North Central Branch Meeting.** Madison, Wisconsin.
- 2002 Luis A. Cañas\*, Steven E. Naranjo, and Peter C. Ellsworth. Ecologically-based IPM of *Bemisia tabaci* in Arizona: seasonality and low-temperature dynamics. **Oral Presentation. Entomological Society of America National Meeting.** Fort Lauderdale, Florida.
- Luis A. Cañas\*, Steven E. Naranjo, and Peter C. Ellsworth. Temperature and host plant effects on the biodemography of *Bemisia tabaci* in Arizona. **Oral Presentation. Ecological Society of America National Meeting.** Tucson, Arizona.
- Luis A. Cañas\*, Steven E. Naranjo, and Peter C. Ellsworth. Whitefly survival and development in year-round cropping systems. **Invited Speaker, Annual Vegetable Crops Field Day.** Maricopa Agricultural Center, Maricopa, Arizona.
- Luis A. Cañas\*, Steven E. Naranjo, and Peter C. Ellsworth. Seasonal Ecology of *Bemisia tabaci* in Arizona: Low Temperature and Host Plant Effects on Field Populations and Associated Mortality Factors. **Oral Presentation. National Research, Action, and Technology Transfer Plan: Fourth Annual Review of the Second 5-Year Plan and Final Report for 1992-2002.** San Diego, California.
- 2001 Luis A. Cañas\*, Peter C. Ellsworth and Steven E. Naranjo. Seasonal Ecology of *Bemisia tabaci* in Arizona: Low Temperature Dynamics. **Poster presentation at Entomological Society of America.** National Conference. San Diego, California.
- Luis A. Cañas\*, Peter C. Ellsworth and Steven E. Naranjo. Seasonal Ecology of *Bemisia tabaci* in Arizona: Host Plant Effects on Field Populations and Associated Mortality Factors. **Invited Speaker, 11th Annual Desert Vegetable Crop Workshop.** Yuma, Arizona.
- Luis A. Cañas\*. Population Ecology of *Leptinotarsa undecimlineata* Stal (Coleoptera: Chrysomelidae) and Their Effects on *Solanum Lanceolatum* Cav In Honduras. **Invited Speaker, Entomology Seminar Series.** University of Arizona. Tucson, Arizona.
- Luis A. Cañas\* and R. J. O'Neil. Methodologies of Implementing Augmentation Biological Control. **Invited Speaker, Augmentation Biological Control Symposium.** Florida Entomological Society. West Palm Beach, Florida.
- 2000 \*\*Luis A. Cañas\*, Robert J. O'Neil and Timothy Gibb. Population Ecology of *Leptinotarsa undecimlineata* Stal (Coleoptera: Chrysomelidae) and Their Effects on *Solanum Lanceolatum* Cav In Honduras. **Poster presentation at Entomological Society of America.** National Conference. Montreal, Canada.
- 1997 Cañas\*, L. A. and R. J. O'Neil. Observations on the natural history of *Leptinotarsa undecimlineata* in Honduras. **Poster presentation at Entomological Society of America.** National Conference, Nashville, Tennessee.
- 1995 Cañas\*, L. A. and R. J. O'Neil. Attraction of natural enemies to sugar applications in Honduran maize. **Poster presentation at Entomological Society of America.** National Conference, Las Vegas, Nevada.
- Cañas\*, L. A. and R. J. O'Neil. Natural enemy's response to sugar applications in maize and its effect on Fall Armyworm populations. **Poster presentation at ESA-North Central Branch meeting**, Omaha, Nebraska.

- 1992 Cañas\*, L. A. Evaluation of five action thresholds to control Fall Armyworm, *Spodoptera frugiperda* (J. E. Smith) in grain sorghum. **IV International IPM congress**, Zamorano, Honduras.

**Outreach presentations (49 total; people reached 1,815)**

- 2008 **Luis A. Cañas.** Extension Reloaded: insect management using IPM. March 11, 2008. Greater Cleveland Flower Grower Association – Coordinated by Tim Malinich. Approximate number of participants = 49 people. Presented information about problems observed during the onsite visit and discussed options for control. Invited Speaker, oral presentation, Avon, OH.
- Luis A. Cañas.** Best management practices to Successfully Manage Insects in Greenhouses. February 7, 2008. Hamilton County – Tri State Green Industry Conference. Coordinated by Dave Dyke and Bob Warnock. Approximate number of participants = 20 people. Discussed how to use both pesticides and natural enemies for control of greenhouse pests. Invited Speaker, oral presentation (1.5 hr), Sharonville, Ohio. (Submitted 16 group evaluations, average = 4.91/5).
- Luis A. Cañas.** Insect Identification and Sampling. February 27, 2008. 2008 Greenhouse Management Workshop – Coordinated by Dr. Peter Ling. Approximate number of participants = 7 people. Discussed insect pests and beneficial organism identification and management. Invited Speaker, oral presentation, Wooster, OH.
- Luis A. Cañas.** Current management practices for control of greenhouse insect pests. January 3, 2008. Maumee Valley Growers meeting – Coordinated by Bob Hornack Brown. Approximate number of participants = 38 people. Invited Speaker, oral presentation, Toledo, OH.
- 2007 **Luis A. Cañas.** The good the bad and the ugly: how to manage insect problems in greenhouses. January 4, 2007. Richland County – Coordinated by Dr. Maurus Brown. Approximate number of participants = 42 people. Presented detailed information about management options for greenhouse insects. Discussed current chemistries available for insect control. Invited Speaker, oral presentation, Shiloh, OH. (Submitted 20 group evaluations, average = 4.66/5).
- Luis A. Cañas.** From Sampling to Control, What You Really Need to Know to Successfully Manage Insects in Greenhouses. February 1, 2007. Hamilton County – Coordinated by Dave Dyke and Bob Warnock. Approximate number of participants = 21 people. Discussed how to use both pesticides and natural enemies for control of greenhouse pests. Invited Speaker, oral presentation (1.5 hr), Sharonville, Ohio.
- Luis A. Cañas.** Insect Identification and Sampling. February 6, 2007. 2007 Greenhouse Management Workshop – Coordinated by Dr. Peter Ling. Approximate number of participants = 26 people. Discussed insect pests and beneficial organism identification and management. Invited Speaker, oral presentation, Wooster, OH. (Received 15 evaluations, average = 4.7/5).
- Luis A. Cañas.** Greenhouse Insect Management Update. February 8, 2007. 2007 Pesticide Recertification Conference – Coordinated by Cindy Folck. Approximate number of participants = 24 people. Discussed insect management practices including current chemistries available to control insects. Invited Speaker, oral presentation, Perrysburg, OH.

**Luis A. Cañas.** Interiorscape Insect Management Update. February 8, 2007. 2007 Pesticide Recertification Conference – Coordinated by Cindy Folck. Approximate number of participants = 14 people. Discussed insect management practices including current chemistries available to control insects. Invited Speaker, oral presentation, Perrysburg, OH.

**Luis A. Cañas.** Keys to Successfully Manage Insects in Greenhouses and Why We Sometimes Fail. February 13, 2007. 2007 Annuals School Conference – Coordinated by Tim Malinich. Approximate number of participants = 89 people. Discussed insect management practices including current chemistries available to control insects. Invited Speaker, oral presentation, Avon, OH.

**Luis A. Cañas.** Greenhouse Insect Management Update. February 27, 2007. 2007 Pesticide Recertification Conference – Coordinated by Cindy Folck. Approximate number of participants = 41 people. Discussed insect management practices including current chemistries available to control insects. Invited Speaker, oral presentation, Columbus, OH.

**Luis A. Cañas.** Interiorscape Insect Management Update. February 27, 2007. 2007 Pesticide Recertification Conference – Coordinated by Cindy Folck. Approximate number of participants = 28 people. Discussed insect management practices including current chemistries available to control insects. Invited Speaker, oral presentation, Columbus, OH.

**Luis A. Cañas.** Extension Reloaded: Greenhouse insects and pesticide updates. March 8, 2007. Toledo Area Flower and Vegetable Grower Association – Coordinated by Dr. Beth Fausey. Approximate number of participants = 51 people. Presented information about problems observed during the onsite visit and discussed options for control. Invited Speaker, oral presentation, Sylvania, OH

**Luis A. Cañas.** Extension Reloaded: How to manage insects. March 13, 2007. Greater Cleveland Flower Grower Association – Coordinated by Tim Malinich. Approximate number of participants = 54 people. Presented information about problems observed during the onsite visit and discussed options for control. Invited Speaker, oral presentation, Avon, OH.

2006

**Luis A. Cañas.** Interiorscape Insect Management Update. December 14, 2006. 2006 Pesticide Recertification Conference – Coordinated by Cindy Folck. Approximate number of participants = 25 people. Discussed insect management practices including current chemistries available to control insects. Invited Speaker, oral presentation, Willington, OH.

**Luis A. Cañas.** Greenhouse Insect Management Update. December 14, 2006. 2006 Pesticide Recertification Conference – Coordinated by Cindy Folck. Approximate number of participants = 34 people. Discussed insect management practices including current chemistries available to control insects. Invited Speaker, oral presentation, Willington, OH.

**Luis A. Cañas.** Interiorscape Insect Management Update. November 21, 2006. 2006 Pesticide Recertification Conference – Coordinated by Cindy Folck. Approximate number of participants = 21 people. Discussed insect management practices including current chemistries available to control insects. Invited Speaker, oral presentation, Akron, OH.

**Luis A. Cañas.** Greenhouse Insect Management Update. November 21, 2006. 2006 Pesticide Recertification Conference – Coordinated by Cindy Folck. Approximate number of participants = 33 people. Discussed insect management practices including current chemistries available to control insects. Invited Speaker, oral presentation, Akron, OH.

**Luis A. Cañas.** Extension Reloaded: Detecting insect problems in greenhouses and how to manage them, Claudio Pasian, Luis Cañas, Peter Ling. October 19, 2006. ABE Green Industry Center – Coordinated by Beth Fausey. Approximate number of participants = 23 people. Presented information about problems observed during the onsite visit and discussed options for control. Invited Speaker, oral presentation, Bowling Green, OH.

**Luis A. Cañas.** What's Bugging You? August 15, 2006. Oberlin, OH – Green Circle Growers Inc. Grower's Meeting. Approximate number of participants = 24 people. Discussed current techniques to manage insect pests in greenhouses. Invited Speaker, oral presentation (0.5 hr).

**Luis A. Cañas.** Biological Controls to Manage Vegetable Greenhouse Pests. June 6, 2006. Ridgeway, OH – Coordinated by Beth Fausey, Extension ABE Center, Bowling Green, OH. Approximate number of participants = 12 people. Discussed how to use natural enemies to control arthropod pests in greenhouses. Invited Speaker, oral presentation (1.0 hr).

**Luis A. Cañas.** Extension Reloaded: Detecting insect problems in greenhouses and how to manage them, Claudio Pasian, Luis Cañas, Peter Ling. April 5, 2006. Cincinnati Flower Grower's Association – Coordinated by Dave Dyke. Approximate number of participants = 44 people. Presented information about problems observed during the onsite visit and discussed options for control. Invited Speaker, oral presentation, Hamilton County, Cincinnati, OH.

**Luis A. Cañas.** Interiorscape Insect Management Update. February 23, 2006. 2006 Pesticide Recertification Conference – Coordinated by Cindy Folck. Approximate number of participants = 26 people. Discussed insect management practices including current chemistries available to control insects. Invited Speaker, oral presentation, Columbus, OH.

**Luis A. Cañas.** Greenhouse Insect Management Update. February 23, 2006. 2006 Pesticide Recertification Conference – Coordinated by Cindy Folck. Approximate number of participants = 31 people. Discussed insect management practices including current chemistries available to control insects. Invited Speaker, oral presentation, Columbus, OH.

**Luis A. Cañas.** How to Manage Insect Pests by Using Pesticides and Natural Enemies. February 2, 2006. Hamilton County – Coordinated by Dave Dyke and Bob Warnock. Approximate number of participants = 26 people. Discussed how to use both pesticides and natural enemies for control of greenhouse pests. Invited Speaker, oral presentation (1.0 hr), Sharonville, Ohio.

**Luis A. Cañas.** Managing Insect Problems in Greenhouses: Can a True Integrated Program be Achieved? January 4, 2006. Richland County – Coordinated by Dr. Maurus Brown. Approximate number of participants = 41 people. Presented detailed information about management options for greenhouse insects. Discussed current chemistries available for insect control. Invited Speaker, oral presentation, Shiloh, OH..

2005

**Luis A. Cañas.** Using Biological Controls to Manage Greenhouse Pests. December 28, 2005. – Coordinated by Beth Fausey. Number of participants = 15 people. Presented information on how to incorporate biological control agents into a pest management program. Invited Speaker, oral presentation, Whitehouse, OH.

**Luis A. Cañas.** Current tools to manage insect pests in greenhouse ornamentals and vegetables. December 5, 2005. Gearing Up for the Growing Season, OSU Extension – Coordinated by Beth Fausey. Number of participants = 8 people. Discussed insect management practices including current chemistries used to control insects and how to include biological control. Invited Speaker, oral presentation, Bowling Green, OH.

**Luis A. Cañas.** Greenhouse Insect Management Update. December 9, 2005. 2005 Pesticide Applicator Training, OSU Extension Agent In-service Ag. Admin. Auditorium, OSU Campus – Coordinated by Cindy Folck. Approximate number of participants = 82 people. Discussed insect management practices including current chemistries available to control insects. Invited Speaker, oral presentation, Columbus, OH.

Extension Reloaded: Detecting insect problems in greenhouses and how to manage them, Claudio Pasion, **Luis Cañas**, Peter Ling. April 6, 2005. Cincinnati Flower Grower's Association – Coordinated by Dave Dyke. Approximate number of participants = 48 people. Presented information about problems observed during the onsite visit and discussed options for control. Invited Speaker, oral presentation, Hamilton County, Cincinnati, OH.

**Luis A. Cañas.** New Insect Pests and How to Control Them. February 24, 2005. Toledo Area Bedding Plant Clinic – Coordinated by Mary Donnell. Approximate number of participants = 59 people. Presented detailed information about management options for pink hibiscus mealybug, whitefly biotype Q, and information about including natural enemies on pest management programs. Discussed current chemistries available for insect control. Invited Speaker, oral presentation, Toledo, OH. (Submitted 21 group evaluations, average = 4.33/5).

**Luis A. Cañas.** Greenhouse Insect Control Update: Managing Old and New Problems. February 22, 2005. Summit County – Coordinated by Denise Ellsworth. Approximate number of participants = 14 people. Discussed management of thrips, whiteflies, and leafminers. Also included information about the pink hibiscus mealybug and whitefly biotype Q. Invited Speaker, oral presentation (1.0 hr), Hartville, OH.

**Luis A. Cañas.** Strategies for Controlling Difficult to Control Insects. February 10, 2005. Hamilton County – Coordinated by Dave Dyke and Bob Warnock. Approximate number of participants = 18 people. Discussed the identification characteristics and management of whiteflies, thrips and leafminers. Also included information about the pink hibiscus mealybug and whitefly biotype Q. Invited Speaker, oral presentation (1.0 hr), Covington, Kentucky. (Submitted 13 Evaluations, average = 4.37/5).

**Luis A. Cañas.** Managing Insect Pests in Greenhouses: New Threats and New Aids. January 5, 2005. 2005 Pesticide Applicator Training, OSU Extension Agent In-service Ag. Admin. Auditorium, OSU Campus – Coordinated by Cindy Folck. Approximate number of participants = 69 people. Discussed current insect management practices including insecticides available for use on greenhouse ornamentals and vegetables. Columbus, OH. (Submitted 1 Peer Evaluation Form, average = 4.18/5).

2004

**Luis A. Cañas.** Insects Up-Close and Personal: Learn to Identify and Control What's Eating Your Plants. January 22, 2004. Ohio Fruit and Vegetable Growers Congress – Coordinated by Mary Donnell. Approximate number of participants = 29 people. Discussed identification techniques and key characteristics of insect pests of vegetables produced in greenhouses, oral presentation, Toledo, OH. (Submitted 6 group evaluations, average = 4.54/5). (Invited Presentation).

**Luis A. Cañas.** Pests and Diseases: Diagnosing and Managing Crop Problems – Signs and Symptoms. July 10. Ohio Florist Association National Meeting. Number of participants = 63 people. Discussed the main signs and symptoms that characterize insect damage in ornamental crops. Invited Speaker, oral presentation, Columbus, OH. (32 evaluations submitted, average = 6.2/7). (Invited Presentation).

**Luis A. Cañas.** Thrips and INSV: An In-Depth Look at Their Biology, Connection, and Control. July 12. Ohio Florist Association National Meeting. Number of participants = 110 people. Discussed the biology of the Thrips and its relevance for their management, explained their importance as vectors of diseases. Invited Speaker, oral presentation, Columbus, OH. (83 evaluations submitted, average = 6.2/7). (Invited Presentation).

**Luis A. Cañas.** Greenhouse Insect Management Update. January 7, 2004. 2004 Pesticide Applicator Training, OSU Extension Agent Inservice Ag. Admin. Auditorium, OSU Campus – Coordinated by Cindy Folck. Approximate number of participants = 65 people. Discussed current insect management practices including current chemistries. Columbus, OH. (Submitted 10 peer review evaluations, average = 4.27/5).

**Luis A. Cañas.** Review of Greenhouse Pesticides. January 14, 2004. Greater Cleveland Flower Growers Association Study Group – Coordinated by Charles Behnke. Approximate number of participants = 52 people. Discussed current chemistries available for insect control. Invited Speaker, oral presentation, Oberlin, OH. (Submitted 10 group evaluations, average = 4.11/5).

**Luis A. Cañas.** Sanitation Measurements to Control Insect Pests in Greenhouses and Update on Control Methods. February 5, 2004. Tri-State Green Industry Expo – Coordinated by Dave Dyke. Approximate number of participants = 15 people. Discussed the importance of sanitation techniques to prevent pest outbreaks in greenhouses. Also discussed current chemistries available for insect control. Invited Speaker, oral presentation, Cincinnati, OH.

**Luis A. Cañas.** Insect Management Options for 2004. February 26, 2004. Toledo Area Bedding Plant Clinic – Coordinated by Mary Donnell. Approximate number of participants = 50 people. Presented detailed information about the different management options available to control insects. They included: sanitation, cultural and biological control. Placed special emphasis in the importance of preventing pest problems. Discussed current chemistries available for insect control. Invited Speaker, oral presentation, Toledo, OH. (Submitted 10 group evaluations, average = 4.38/5).

**Luis A. Cañas.** CD-ROM Produced by the Ohio Florist Association. Pests and Diseases: Diagnosing and Managing Crop Problems – Signs and Symptoms. July 10. Ohio Florist Association National Meeting. Number of participants = 63 people.

**Luis A. Cañas.** CD-ROM Produced by the Ohio Florist Association. Thrips and INSV: An In-Depth Look at Their Biology, Connection, and Control. July 12. Ohio Florist Association National Meeting. Number of participants = 110 people.

**Luis A. Cañas.** The Bug Stops Here: Learning How to Identify and Manage Insect Pests in Greenhouses – December 2, 2004. Richland County Growers Meeting, coordinated by Maurus Brown. Number of participants = 35 people. Presented information about identifying key pests of ornamentals and vegetables grown in greenhouses.

**Luis A. Cañas.** The key to success: Learning how to identify and manage insect pests in greenhouses – December 17, 2004. Medina County Growers Meeting and Poinsettia trials, coordinated by Charles Behnke, Claudio Pasia, Steve Carver. Number of participants = 11 people. Presented information about identifying key pests of ornamentals and vegetables grown in greenhouses.

2003 Luis A. Cañas, Insect Ecology in Controlled Environments Program. December 12, 2003. Loraine County Poinsettia Trials at Barco Sons, Inc. – Coordinated by Charles Behnke, OSU Extension, Loraine County. Approximate number of participants = 40 people. Discussed current ideas that will be explored for management of insect pests on ornamentals grown in greenhouses. **Invited Speaker, oral presentation, Oberlin, OH.**

Luis A. Cañas, Pesticide Safety Series Video – November 3, 2003, Coordinated by Cindy Folck, OSU Extension, Pesticide Education Program, The Ohio State University. “Greenhouses Insect Management Update”, 20 minutes video, topics presented included: insecticide resistance and its management, recently registered insecticides, current greenhouse insecticides including mode of action group. **Invited Speaker, video presentation, The Ohio State University.**

Luis A. Cañas, Using Insect Biogeography to Determine Critical Elements in the Population Ecology and Management of a Pest in a Multi-Crop System. **Invited Speaker, oral presentation, Purdue University, West Lafayette, IN**

**Cincinnati Flower Growers Association Tour and Meeting** - October 1, 2003, Coordinated by Dave Dyke, OSU Extension, Hamilton County. Approximate number of participants = 50 people. IPM meeting and visit to grower’s production facilities (greenhouses, Cincinnati Zoo). Growers visited each other greenhouses accompanied by OSU extension personnel. After the visit, growers and OSU extension personnel discussed current status of facilities and specific ways to improve crop management. Current scouting, pest diagnostics and pest management techniques were discussed. **Presented “Plant Pest and Abiotic Problems, Diagnostics and Controls”** (10 minute talk about specific ways to improve insect management).

**SERVICE:**

- 2008 OSU Entomology Search Committee for Landscape Ecologist position
- 2003-current OSU Entomology Graduate Curriculum Committee
- 2003-current Provided advice to approximately 512 people from growers to home owners.
- 2003-2008 OSU-OARDC Entomology Facilities Committee
- 2003-current OSU-OARDC Seminar Committee (Chair)
- 2003-current OSU-OARDC Greenhouse Committee (Chair)
- 2003-current OSU Entomology. Graduate Studies Committee.
- 2005-2008 Advice and support to C. Wayne Ellett Plant and Pest Diagnostic Clinic. The Ohio State Univ. Assisted with the identification of insect samples and provided information about pest management. Dates: February 26.
- 2005-2006 NCR-125, Chair North Central Branch NCB, Biological Control Regional Committee. Ohio representative.
- 2005-2007 External Grant Panel Evaluator – SENACYT (National Secretariat of Science, Technology and Innovation), Panama, Panama.

- 2004-2008 Entomological Society of America – North Central Branch. Co-Chair awards committee. Judge of Ph.D oral presentation and M.S. student competition.
- 2004-2006 Entomological Society of America – North Central Branch. Graduate Students Awards Committee. Regional meeting, March 19-22. West Lafayette, IN.
- 2003-2006 Entomological Society of America – North Central Branch. National Awards Committee. Regional meeting, March 19-22. West Lafayette, IN.

#### **Organized symposia and workshops:**

- 2008 **Cañas, L.A., J. Sanderson**, The changing nature of insect management in greenhouses: staying one step ahead of arthropod pests. ESA, Reno, NV, November 2008.
- 2008 **Cañas, L.A.**, Spanish educational program: pest identification and management. Indianapolis, IN. Heartland Growers, January 16-17, 2008.
- 2007 **Cañas, L.A., K. Tillmon**, Biocontrol and IPM of Protected Crop Pests in the Americas. Merida, Mexico, IOBC-Mexico Biological Control Society meeting. November 14-16, 2008.
- 2007 **Cañas, L.A., K. Tillmon**, Biological control. NCB-ESA meeting. Manitoba, Canada, March 2008.
- 2005 **Cañas, L.A.**, Midwest Institute for Biological Control Techniques for Evaluating Natural Enemies. Wooster, OH. June 13-16, 2005.
- 2004 **Cañas, L.A., R. Cloyd**, Integrated Pest Management of Ornamentals and Turfgrass: Have we learned from the past, and what does the future hold? Salt Lake City, Utah. November 14, 2004
- 2004 **Cañas, L.A., C. Pasian**, Bilingual pesticide management training. Oberlin, OH. August 10, 17, 2004.

#### **AWARDS:**

- 1996-2000 **Doctoral Scholarship**, International Programs in Agriculture, Purdue University.
- 1994-1996 **Global Initiative Scholarship**, Special Initiative Scholarship, Purdue University.
- 1991-1993 **Monsanto Scholarship**, Pan-American College of Agriculture (Zamorano).
- 1988-1990 **German Government Fellowship (GTZ)**, Pan-American College of Agriculture (Zamorano).

#### **ASSOCIATION MEMBERSHIPS:**

- 2005-2006 American Society for Testing and Materials.
- 2003-Present Ohio Florist Association.
- 2002-Present Ecological Society of America.
- 2000-Present Phi Kappa Phi, Honor Society.
- 1996-Present Gamma Sigma Delta, Honor Society.
- 1996-Present International Organization for Biological Control.
- 1994-Present Entomological Society of America.

**OSU-Zamorano internship program metrics:**

	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Number of applicants</b>	6	14	12	17	15
<b>Interns selected</b>	3	4	6	5	7
<b>Countries represented</b>	2	3	4	4	4
<b>OSU faculty participating</b>	1	3	5	5	6
<b>Students continuing to MS/PhD at OSU</b>	1	3	1	0*	0*
<b>Students continuing to MS/PhD elsewhere</b>	1	1	3	0*	0*