

FNRI Bibliography
Management of Whitefly Biotypes on Floral and Nursery Crops
Agreement # 58-6618-5-0248 / Start Aug 30 2005 to Aug 30 2008
Cumulative Publications and Presentations

Publications (19)

1. Byrne, J. A., F. J. Byrne, R. A. Redak. 2005. Biotype Investigation. Greenhouse Product News, December 2005. V15(13): 18-20.
2. Osborne, Lance S., Ludwig, Scott W., Schmale, Lin. 2005. Q-Biotype Whitefly: A Time for Action. Greenhouse Grower. Sept 70-76.
3. Stansly, Phil, McKenzie, Cindy. 2005. "Q" biotype whitefly: How big a threat? Florida Tomato Institute Proceedings. PRO 522: 29-31.
4. Zalom, F. G., N. C. Toscano, and F. J. Byrne. 2005. Managing Resistance is Critical to Future Use of Pyrethroids and Neonicotinoids. California Agriculture 59: 11-15.
5. Bethke, James, Gilrein, Dan, Ludwig, Scott, Oetting, Ronald, Osborne, Lance. 2006. The Q-biotype Whitefly. Grower Talks. 69(12):44-52.
6. Bethke, J. A. and R. A. Redak. 2006. Control of silverleaf whitefly B and Q biotype on poinsettia under laboratory conditions, spring 2006. To Valent 12-12-06.
7. Bethke, J. A., F. J. Byrne, and R. A. Redak. 2006. The sweetpotato whitefly Q-biotpe studied at the UC Riverside Quarantine Facility. Corf News, Spring 2006. Vol 10 Issue 1. pp. 14.
8. Byrne, F.J. Bethke, J.A. 2006. Differentiating and controlling whiteflies. The Q-biotpe is a manageable pest, and it is not an insurmountable problem. American Nurseryman, December 1, 2006. pp 10-11.
9. Byrne, F. J., J. A. Bethke, and R. A. Redak. 2006. The Q-biotpe: widespread and treatable. CORF News, Summer 2006. V10(2): 1-2, 5.
10. Ludwig, Scott, Ellsworth, Peter. 2006. Q-biotpe Whitefly Update. Ornamental Outlook. 15(7): 36-38.
11. Ludwig, S. & C. McKenzie. 2006. Impact of insecticide residue on silverleaf whiteflies. Proceeding of Southern Nursery Association Research Conference. 51: 138-140.
12. Ludwig, S.W., J. Bethke, R. Oetting, D. Gilrein, and L. Osborne. 2006. Q-biotpe whitefly, they can be controlled. Grower Talks. 69(12): 44-52.
13. Ludwig, S. & P. Ellsworth. 2006. Q-biotpe update. Greenhouse Grower. 24(8): 138-142.
14. Ludwig, S. & P. Ellsworth. 2006. Q-biotpe whitefly update. Ornamental Outlook. 15(7): 36-38.
15. Ludwig, S. & L. Osborne. 2006. Minding your B's & Q's. GMPRO 26(8): 71-73.
16. Ludwig, S. & T.X. Liu. 2006. Q-Biotpe Whitefly Update. TNLA Green Magazine. 8(4):22.
17. Ludwig, S. & T.X. Liu. 2006. Management of the Q-Biotpe Whitefly. TNLA Green Magazine. 8(5):22.
18. Ludwig, S. 2007. New pest invaders. American Nurseryman. 205(10): 32-35.
19. Ludwig, S. & L. Osborne. 2007. Proper planning can help to manage whitefly. GMPRO. 27(8): 53-56.

Oral and Poster Presentations (44)

2005

- Bethke, J.A. 2005. "Efficacy Trials against the Q-Biotype of the Sweetpotato Whitefly, *Bemisia tabaci*". Q-biotype Technical Advisory Committee Meeting, Dallas, TX, Sept 21, 2005.
- McKenzie, C.L. 2005. "Whitefly Biotype "Q": How big a threat?". Industry Liaison Committee, U.S. Horticultural Research Laboratory, Fort Pierce, FL, Nov 22, 2005.

2006

- Bethke, J.A., Byrne, F. 2006. Additional Efficacy Trials against the Q-Biotype of the Sweetpotato Whitefly, *Bemisia tabaci*. Society of American Florists, Propagator's Meeting, Pest Management Workshop, Norwalk, CA. Feb 15, 2006.
- Bethke, J.A. 2006. "Whiteflies: Know your Bs and Qs". Society of American Florists 22nd Annual Conference on Pest Management for Ornamentals, Norwalk, CA, Feb 18, 2006.
- Bethke, J.A. 2006. "Invasive pests: Q-Type Whitefly and Diaprepes Root Weevil". UCCE Integrated Pest Management Training for Landscape Professionals, San Diego, CA, May 9, 2006.
- Bethke, J.A. 2006. "Update for Q-Biotype whitefly research and extension efforts". Second Floral and Nursery Crops Researchers Workshop, Portland, OR, June 15, 2006.
- Bethke, J.A. 2006. "Q-Biotype Whitefly: Strategies for Prevention and Management". Ohio Florist Association Short Course. Q-Biotype Whitefly: Strategies for Prevention and Management. Columbus, OH, July 9, 2006.
- Bethke, J. A. 2006. Q-Biotype Whitefly: Strategies for Prevention & Management. Ohio Florist Association Short Course, Columbus Convention Center, Columbus, Ohio. 7-9-06.
- Bethke, J. A. Byrne F J, R Oetting, and R. A. Redak. 2006. Optimizing the use of the neonicotinoids against the sweetpotato whitefly, *Bemisia tabaci* Gennadius, Q-biotype in ornamental production. ESA Annual Conf 2006.
- Gilrein, D., Siracusano, L. 2006. Control of Q-Biotype Whitefly, *Bemisia tabaci*, on Poinsettia with Foliar Sprays. Society of American Florists, Propagator's Meeting, Pest Management Workshop, Norwalk, CA. Feb 15, 2006.
- Ludwig, S. & C. McKenzie. 2006. Residue activity of insecticides for whitefly control. Entomological Society of American Annual Meeting. Indianapolis, IN.
- Ludwig, S. 2006. *Bemisia tabaci* biotype Q: A new pest of ornamentals in the United States. Ornamental Workshop on Diseases and Pests. Kanuga, NC. Presented and Moderated Session.
- Ludwig, S. & C. McKenzie. 2006. Impact of insecticide residue on silverleaf whiteflies. Southern Nursery Association Research Conference. Atlanta, GA.
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- Ludwig, S., Osborne, L., Oetting, R., Bethke, J., Gilrein, D. 2006. *Bemisia tabaci* Biotype Q: A New Pest of Ornamentals in the United States. Southeastern Branch meeting of the Entomological Society of America, Wilmington, NC, Mar 7, 2006.
- McKenzie, C.L., Byrne, F. 2006. "What is the Q Biotype whitefly?". Society of American Florists, Propagator's Meeting, Pest Management Workshop, Norwalk, CA. Feb 15, 2006.

- McKenzie, C.L. 2006. "What is 'Q' Whitefly: Molecular Differentiation of the Bemisia Biotypes". Ornamentals and Turf symposium, Southeastern Branch meeting of the Entomological Society of America, Wilmington, NC, Mar 7, 2006.
- McKenzie, C.L. Byrne, F. 2006. "Survey and Diagnostics: Subcommittee Update". Q Biotype Technical Advisory Committee Meeting, St Louis, MO, April 3, 2006.
- McKenzie, C.L. 2006. "Detection and Spread of Biotype Q in the United States". Biotype Q of the Sweetpotato Whitefly: An Emerging Threat to Florida Vegetable and Ornamental Crops Symposium, Florida Entomological Society, Jupiter, FL July 24, 2006.
- Oetting, R. 2006. "Georgia 'Q' Whitefly Trials". Society of American Florists, Propagator's Meeting, Pest Management Workshop, Norwalk, CA, Feb 15, 2006.
- Oetting, R. 2006. "Insecticide Efficacy Trials Against the Q Biotype on Greenhouse Crops". Biotype Q of the Sweetpotato Whitefly: An Emerging Threat to Florida Vegetable and Ornamental Crops Symposium, Florida Entomological Society, Jupiter, FL, July 24, 2006.
- Osborne, L., 2006. "Bemisia tabaci Q biotype, Chili Thrips." Colloquium on Plant Pests of Regulatory Significance." University of Florida, Gainesville, FL Jan 25, 2006.
- Osborne, L. 2006. "How One Entomologist Deals with Invasive Species." Southern Association of Agricultural Scientists. Orlando, FL, Feb 5, 2006.
- Osborne, L. 2006. "New and Invasive Pests." Florida Institute of Park Personnel. Wekiva State Park, FL, Mar 13, 2006.
- Osborne, L. 2006. "Imminent threat or Tempest in a Tea Pot? Assessing the Current and Future Implications of the Q biotype on Whitefly Management in the U.S.". Q Biotype Technical Advisory Committee Meeting, St Louis, MO, April 3, 2006.
- Osborne, L. 2006. "Whiteflies and Thrips - New pests of Florida Ornamentals". West Palm Beach Growers Association Meeting, West Palm Beach, FL April 11, 2006.
- Osborne, L. 2006. "New Invasive Species in Florida". Central Florida CEU Day, Apopka, FL, June 14, 2006.
- Osborne, L. 2006. "Stop Pests from Eating Your Profits: Whiteflies." Southeast Greenhouse Conference, Greenville, SC, June 22, 2006.
- Osborne, L. 2006. "Whiteflies: "B" or "Q" Does is Make a Difference?". Southeast Greenhouse Conference, Greenville, SC, June 23, 2006.
- Osborne, L., Ludwig, S. 2006. "Whiteflies: "B" or "Q" Does is Make a Difference?". Ohio Florist Association Short Course. Q-Biotype Whitefly: Strategies for Prevention and Management, Columbus, OH, July 9, 2006.
- Osborne, L. 2006. "What is Biotype Q and Where Did It Come From?". Biotype Q of the Sweetpotato Whitefly: An Emerging Threat to Florida Vegetable and Ornamental Crops Symposium, Florida Entomological Society, Jupiter, FL July 24, 2006.
- Townsend, M., Oetting, R. 2006. "Management of *Bemisia tabaci* strain 'Q' in Georgia Greenhouses". 70th Annual Georgia Entomological Society Meeting. Jekyll Island, GA, March 29-31, 2006.

2007

- Bethke, J. A. 2007. New, emerging and existing pest management challenges: Q-Biotype. 2007 Ornamental Technical Forum, Syngenta Professional Products, The Kahala Resort, Honolulu, Hawaii. 3-6-07.
- Bethke, J. A. 2007. Whipping Whiteflies. GrowerTalks Greenhouse Experience 2007, Renaissance Hotel, Cleveland, OH. 9-10-07.
- Bethke, J. A. Byrne F J, R Oetting, and R. A. Redak. 2007. Knowing your Bs and Qs the use of the

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- Ludwig, S. Update on whitefly biotypes. OFA Short Course. Columbus, OH. (July 2007)
- Ludwig, S. *Bemisia tabaci* biotype Q. Hilo Flower Growers Meeting. Hilo, HI. (March 2007).
- Ludwig, S. Update on new pests and invasives of concern. Society of American Florist Pest Management Conference. Portland, OR. 2007
- Ludwig, S. New insect issues impacting horticultural crops. High Plains Vegetable Growers Conference. Canyon, TX. 2007.
- Ludwig, S. Managing greenhouse insect pests. Plants 2007. Hot Spring, AR.
- Ludwig, S. IPM update. East Texas Nursery and Greenhouse Growers Conference. Tyler, TX.
- Ludwig, S., P. Ellsworth, L. Osborne, T. Dennehy, & O. El-Lissy. 2007. Technical advisory committee of the Q-Biotype whitefly taskforce. Southwest Branch Meeting of the Entomological Society of America. Chattanooga, TN.
- Oetting, Ron. "What's new in insect management", Southeast Greenhouse Conference, Greenville, SC, June 22, 2007.
- Oetting, Ron "Insect pest on poinsettias", Southeast Greenhouse Conference, Greenville, SC, June 21, 2007.

*2008 publications and presentations are presented in the following SCA summary as they overlapped in years.

**Invasive Species Management Template Development with an Initial Emphasis on Thrips
Agreement # 58-6618-8-118
Cumulative Publications and Presentations
Start Sept 16 2008 to Sept 16 2013**

FNRI project funded ten postdocs (italics) over the life of the NACA and are indicated in italics in the references: *Laura Boykin, Aaron Dickey, Mahmut Dogramaci, Paula Hall, He Lian Sheng, Garima Kakkar, Vivek Kumar, Avery Pasco, Vitalis Wekesa, Yingfang Xiao.* Collectively this team has published 28 refereed publications, 43 other publications and made over 180 presentations.

Refereed Publications (27)

1. Bethke, James A., Frank J. Byrne, Greg S. Hodges, Cindy L. McKenzie, and Robert G. Shatters, Jr. 2008. First report of the Q biotype of *Bemisia tabaci* (Gennadius) in Guatemala. *Phytoparasitica* 37:61-64.
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5. Arthurs, Steven, Cindy McKenzie, Jianjun Chen, *Mahmut Dogramaci*, Mary Brennan, Katherine Houben, and Lance S. Osborne. 2009. Evaluation of *Neoseiulus cucumeris* and *Amblyseius swirskii* (Acari: Phytoseiidae) as biological control agents of Chilli thrips, *Scirtothrips dorsalis* (Thysanoptera: Thripidae) on pepper. *Biological Control* 49(1):91-96.
6. McKenzie, C. L., Greg Hodges, Lance S. Osborne, Frank J. Byrne and Robert G. Shatters, Jr. 2009. Distribution of *Bemisia tabaci* (Hemiptera: Aleyrodidae) biotypes in Florida – Investigating the “Q” invasion. *J Econ Entomol* 102(2):670-676.
7. Shatters, Robert G. Jr., Charles A. Powell, *Laura M. Boykin, He Lian Sheng*, and C. L. McKenzie. 2009. Improved DNA barcoding method for *Bemisia tabaci* and related Aleyrodidae: Development of universal and *Bemisa tabaci* biotype-specific mitochondrial cytochrome c oxidase I polymerase chain reaction primers. *J Econ Entomol* 102(2):750-758.
8. Byrne, F.J., R.D. Oetting, J.A. Bethke, C Green, and J. Chamberlin. 2010. Understanding the dynamics of neonicotinoid activity in the management of *Bemisia tabaci* whiteflies on poinsettias. *Crop Protection* 29 (2010) 260-266.
9. *Avery, Pasco B., Vitalis W. Wekesa*, Wayne B. Hunter, David G. Hall, Cindy L.

- McKenzie, Lance S. Osborne, Charles A. Powell, and Michael E. Rogers. 2011. Effects of the fungus *Isaria fumosorosea* (Hypocreales: Cordycipitaceae) on reduced feeding and mortality of the Asian citrus psyllid, *Diaphorina citri* (Hemiptera: Psyllidae). *BioControl Science and Technology* 21(9):1065-1078. doi:10.1080/09583157.2011.596927.
10. Avery, Pasco B., Catharine M. Mannion, Charles A. Powell, Cindy L. McKenzie, and Lance Osborne. 2011. Natural enemies managing the invasion of the Fig whitefly, *Singhiella simplex* (Hemiptera: Aleyrodidae), infesting a *Ficus benjamina* hedge. *FL Entomol* 94(3): 696-698. doi: 10.1653/024.094.0338
 11. Dogramaci, Mahmut, Jianjun Chen, Steven P. Arthurs, Cindy L. McKenzie, Irizarry Fabieli, Katherine Houben, Mary Brennan, and Lance Osborne. 2011. Mini-aspirator: A new device for collection and transfer of small arthropods to plants. *FL Entomol* 94(1): 22-27.
 12. Dogramaci, Mahmut, Steven P. Arthurs, Jianjun Chen, Cindy McKenzie, Fabieli Irrizary, and Lance Osborne. 2011. Management of chilli thrips *Scirtothrips dorsalis* (Thysanoptera: Thripidae) on peppers by *Amblyseius swirskii* (Acari: Phytoseiidae) and *Orius insidiosus* (Hemiptera: Anthocoridae). *Biological Control* 59: 340-347. doi:10.1016/j.biocontrol.2011.09.008
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 14. Huang, Ningxing, Annie Enkegaard, Lance S. Osborne, Pierre M. J. Ramakers, Gerben Messelink, Juliette Pijnakker, and Graeme Murphy. 2011. The banker plant method in biological control. *Critical Reviews in Plant Sciences* 30:259-278.
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 17. Xiao, Yingfang, Jianjun Chen, Daniel Cantliffe, Cindy McKenzie, Katherine Houben, and Lance Osborne. 2011. Establishment of papaya banker plant system for parasitoid, *Encarsia sophia* (Hymenoptera: Aphelinidae) against *Bemisia tabaci* (Hemiptera: Aleyrodidae) in greenhouse tomato production. *Biological Control* 58: 239-247. Doi:10.1016/j.biocontrol.2011.06.004.

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21. *Kumar, Vivek*, Dakshina R. Seal, *Garima Kakkar*, Cindy L. McKenzie, and Lance S. Osborne. 2012. New tropical fruit hosts of *Scirtothrips dorsalis* (Thysanoptera: Thripidae) and its relative abundance on them in South Florida. *Florida Entomol.* 95:205-207. <http://dx.doi.org/10.1653/024.095.0134>
22. McKenzie, Cindy L., James A. Bethke, Frank J. Byrne, Joseph R. Chamberlin, Timothy J. Dennehy, *Aaron M. Dickey*, Dan Gilrein, *Paula M. Hall*, Scott Ludwig, Ronald D. Oetting, Lance S. Osborne, Lin Schmale, Robert G. Shatters, Jr. 2012. Distribution of *Bemisia tabaci* (Hemiptera: Aleyrodidae) Biotypes in North America following the Q Invasion. *J Econ Entomol* 105(3): 753-766. DOI: <http://dx.doi.org/10.1603/EC11337>
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27. *Doğramaci, Mahmut*, Steven P. Arthurs, Jianjun Chen & Lance Osborne. 2013. Silicon Applications have Minimal Effects on *Scirtothrips dorsalis* Hood (Thysanoptera:

Thripidae) Populations on Pepper Plant, *Capsicum annum* L. Florida Entomologist 96(1) 48-54.

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Other Publications (43)

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34. Bethke, J. A. and R. A. Redak. 2008. Control of adult sweetpotato whitefly, *Bemisia tabaci* B & Q biotype, on poinsettia using Endeavor (pymetrozine) under laboratory conditions. IR4. 2-10-2008.
35. Bethke, J. A. and R. A. Redak. 2008. Efficacy trial conducted against nymphs of *Bemisia tabaci*, Q-Biotype (Poinsettia '04), within the Quarantine Facility at UC Riverside. IR4. 2-10-2008.
36. Bethke, J. A. and R. A. Redak. 2008. Control of silverleaf whitefly B & Q biotype on poinsettia under laboratory conditions using the Potter Spray Tower. IR4. 2-10-2008.
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- sequences. GenBank Acc. Nos. EU881708 through EU881713, National Center for Biotechnology Information (NCBI). <http://www.ncbi.nlm.nih.gov/> (Public Database).
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 48. Ludwig, Scott and Lance Osborne. 2010. Thrips Management. Proceedings of the 26th Annual Pest and Production Management Conference. XXVI: 50-53. (Proceedings).
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(Proceeding Abstract).

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51. Popenoe, Juanita and Lance Osborne. 2010. Rose nursery banker plants. Proc of the Florida Horticultural Society 123: 296-297.
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53. McKenzie, Cindy and Robert G. Shatters, Jr. 2011. North American mitochondrial whitefly (*Bemisia tabaci*) biotyping dataset (excluding Florida): 280 mtCO1 sequences. GenBank Acc.Nos. HQ198596-HQ198617, HQ198623-HQ198640, HQ198642-HQ198645, HQ198647-HQ198650, HQ198656-HQ198677, HQ198679-HQ198687, HQ198689, HQ198690, HQ198692- HQ198703, HQ198707- HQ198730, HQ198732-HQ198743, HQ198745- HQ198750, HQ198752, HQ198755, HQ198758, HQ198765, HQ198767, HQ198772- HQ198806, HQ877499-HQ877510, HQ877512-HQ877520, HQ877522-HQ877546, HQ877548-HQ877568, HQ877570, HQ877572, HQ877573, HQ877575, HQ877578, HQ877588-HQ877590, HQ877592-HQ877602, JF754907- JF754912, JF754914-JF754925, JN547217 National Center for Biotechnology Information (NCBI). <http://www.ncbi.nlm.nih.gov/> (Public Database).
54. Osborne, Lance, Joe Chamberlin, Cindy McKenzie and Scott Ludwig. 2011. Moving plants means moving pests. Society of American Florists, Proceedings of the 27th Annual Pest and Production Management Conference. XXVII: 6-13. (Proceedings).
55. Kumar, V., D. R. Seal, G. Kakkar, C. L. McKenzie, and L. S. Osborne. 2012. Chilli thrips, *Scirtothrips dorsalis*: A potential threat to cotton production in the USA. Proceedings Beltwide Cotton Conferences, 65th Cotton Insects Research Control Conf. 2:817-819.
56. Osborne, Lance, Joe Chamberlin and Cindy McKenzie. 2012. Moving plants means moving pests (updated version). Society of American Florists, Proceedings of the 27th Annual Pest and Production Management Conference. XXVIII: 26-33. (Proceedings).
57. Osborne, Lance, Yingfang Xiao, J. Chen, and Cindy McKenzie. 2012. Using Banker Plants to control insects. Society of American Florists, Proceedings of the 28th Annual Pest and Production Management Conference. XXVIII: 85-90. (Proceedings).
58. Aristizabal, L.F., Avery, P.B., Kumar, V., Caldwell, J.H., McKenzie, C.L., Osborne, L.S. 2013. Pre shipping dip treatments using soap, natural oils, and *Isaria fumosorosea*: potential biopesticides for mitigating the spread of whitefly *Bemisia tabaci* (Hemiptera: Aleyrodidae) invasive insects on ornamental plants [abstract]. Florida Entomological

Society. Paper No. 54. (Abstract)

59. Avery, P.B., McKenzie, C.L., Powel, C.A., Osborne, L.S. 2013. Efficacy of *Isaria fumosorosea* Wize (Hypocreales: Cordycipitaceae) on the leaf phylloplane over time for controlling Madeira mealybug nymphs preshipping. *Florida Scientist* 76:9-10. (Proceedings).
60. Chamberlin, Joe, Cindy McKenzie, Lance Osborne, Lin Schmale. 2013. A call to action – Or others will force their will upon us! Society of American Florists, Proceedings of the 29th Annual Pest and Production Management Conference. XXIX: 71-81. (Proceedings).
61. Dickey, A.M., Trease, A., Jara, A., Kumar, V., Christenson, M.K., Portluri, P., Morgan, J.K., Shatters, R.G., Jr., Davis, P.H., McKenzie, C.L., Osborne, L.S. 2013. Next-generation DNA sequencing of the globally invasive plant pest, *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae) [abstract]. Florida Entomological Society. Paper No. 41.
62. Kumar, V., G. Kakkar, C. L. McKenzie, D. R. Seal and L. Osborne. 2013. An overview of chilli thrips, *Scirtothrips dorsalis* (Thysanoptera: Thripidae) Biology, Distribution and Management. Pp. 53-77. *In*: S. Solenski and M. Larramendy (eds.), *Weed and Pest Control – Conventional and New Challenges*. Intech. Rijeka, Croatia. 205 pp. (Book Chapter).
63. Kumar, V., Kakkar, G., Seal, D.R., McKenzie, C.L., Osborne, L.S. 2013. Vertical and horizontal distribution and seasonal dynamics of an invasive thrips species, *Scirtothrips dorsalis* (Thysanoptera: Thripidae) in south Florida. *Florida Scientist* 76:7-8. (Proceedings).
64. Kumar, V., Wekesa, V., Avery, P.B. Powell, C.A., McKenzie, C.L., Osborne, L.S. 2013. Effect of different ornamental pepper pollens on the development and reproduction of *Amblyseius swirski* (Acari: Phytoseiidae) [abstract]. Southeastern Branch of Entomological Society of America. Paper No. DSP50.
65. Kumar, Vivek, Avery, P. B., Cave, R. D., Francis, A. Smith, T., McKenzie, C.L., and Osborne, L., 2013. Efficacy of an entomopathogenic fungus, *Isaria fumosorosea*, and an insect growth regulator against the rugose spiraling whitefly, *Aleurodicus rugioperculatus* Martin (Hemiptera: Aleyrodidae). [abstract]. Entomological Society of America. Paper No. D0393.
66. McKenzie, C.L., Dickey, A., Osborne, L.S., Kumar, V. Shatters, R.G, Jr. 2013. Haplotype analysis of global chilli thrips (*Scirtothrips dorsalis*) populations using the metazoan barcode [abstract]. Florida Entomological Society. Paper No. 40.
67. McKenzie, C.L., Kumar, V., Palmer, C.L., Oetting, R.D., Osborne, L.S. 2013. Chemical class rotations for control of *Bemisia tabaci* (Hemiptera: Aleyrodidae) on poinsettia and their effect on cryptic species population composition [abstract]. Entomological Society of America. Paper No. D0554.

68. Oetting, R., McKenzie C., and Townsend M. 2013. Efficacy of insecticide rotations and their impact on populations of the 'B' and 'Q' biotypes of *Bemisia tabaci*. First International Whitefly Symposium, Kolybari, Crete, Greece T8.P-02: 229 (Proceedings).
69. Wilkerson, M., Hix, R.L., Dickey, A.M., McKenzie, C.L. 2013. Characterizing population and genetic structure of *Aleurodicus rugioperculatus* Martin (Hemiptera:Aleyrodidae) in Florida [abstract]. Southeastern Branch of Entomological Society of America. Paper No. 032.
70. Xiao, Y., Osborne, L., McKenzie, C.L., Chen, J. 2013. Influence of diet conditions on predation response of a predatory mite to a polyphagous insect pest. *Florida Scientist* 76:16-17. (Proceedings).
71. Xiao, Y., Osborne, L.S., McKenzie, C.L., Kumar, V., Chen, J., Taravati, S. 2013. Giant whitefly (*Aleurodicus dugesii*) as a surrogate for evaluating the parasitoid wasp (*Encarsiella noysei*) for biological control of Rugose spiraling whitefly (*Aleurodicus rugioperculatus*) [abstract]. Florida Entomological Society. Paper No. 16.

Oral and Poster Presentations

2008

- Bethke, J. A. 2008. Optimizing the use of the neonicotinoid insecticides in floriculture. International Cut Flower Growers 2008 Annual Meeting, Mission Valley Resort, San Diego, CA. 4-12-08.
- Bethke, J. A. 2008. Battling Invasive Pests and Diseases: Quarantine regulations for invasive pests: Three recent examples. Lion's Park, Carpenteria, CA.
- Bethke, J. A. 2008. Invasive Pests and Regulations. Plug and Cutting Conference, GrowerTalks and Ohio florists Association, Rosen Plaza Hotel, Orlando FL. 9-29-08.
- Bethke, J. A. 2008. Invasive species and regulations affecting San Diego. Laws and Regs Seminar, CAPCA San Diego Chapter, San Diego Farm Bureau, Escondido, CA. 12-10-08
- Bethke, J. A. 2008. Invasive pests in greenhouse foliage crops. Greenhouse Seminar and Tour, Southern California Chapter and UCCE Orange County, Kallisto Greenhouse, Fontana, CA. 12-5-08
- Bethke, J. A. 2008. Invasive pests: What to do? San Diego CAPCA's Nursery Greenhouse Seminar 2008. The Windmill, Carlsbad, CA. 6-5-08
- Leibee, Gary L., Lance S. Osborne, Moh Leng Kok-Yokomi, Cindy L. McKenzie, and Robert Shatters, Jr. 2008. Toxicity of Selected Insecticides to a Strain of *Bemisia tabaci* Biotype Q from Florida. 4th Pan Pacific Conference on Pesticide Science, Honolulu, HI, 2 Jun 08.
- Gilrein, Dan. 2008. ID & Management of Insects & Mites of Greenhouse and Outdoor Ornamentals. Hudson Valley Nursery and Greenhouse Growers School. New Paltz, NY. January 15, 2008. 120 attendees.
- Gilrein, Dan. 2008. Managing Greenhouse Arthropods: Back to the Basics. Capital District Bedding Plant Conference and Trade Show. Latham, NY. January 16, 2008. 120 attendees.

- Gilrein, Dan. 2008.. Insects and Mites – Current Problems and Fixes. Long Island Greenhouse and Floriculture Conference. January 22, 2008. 60 attendees.
- Gilrein, Dan. 2008. 2008 Integrated Pest Management & Insect and Mite Problems of Ornamental Plants. Long Island Horticulture Training School. Riverhead, NY. February 19, 2008. 30 attendees.
- Gilrein, Dan. 2008. Field Reports, Results of Efficacy Trials, New Products and Current Issues. Entomological Society of America, Eastern Branch, Annual Meeting. Syracuse, NY. March 10, 2008. 50 attendees.
- Gilrein, Dan. 2008. Introduction to Insects. Urban Horticulture and Ecology Training Program. Cornell Cooperative Extension, Manhattan. March 19, 2008. 45 attendees.
- Gilrein, Dan. 2008. Entomology Research at the LIHREC. Long Island Horticultural Research and Extension Center Plant Science Day. July 8, 2008. 60 attendees.
- Gilrein, Dan. 2008. Pest Control Products and Strategies: What’s Working and What’s Not Working in the Real World. New England Greenhouse Conference. Integrated Pest Management for Propagation. 120 attendees.
- Leibee, G.L., L. S. Osborne, M. Leng Kok-Yokomi, C. L. McKenzie & R. Shatters, Jr. 2008. Toxicity of selected insecticides to a strain of *Bemisia tabaci* Type Q from Florida. Annual meeting Entomological Society of America. November, 2008 Reno, NV.
- Ludwig, S. 2008. Managing new and old ornamental insect pests. Spring Pest Management Seminar. Richardson, TX. (February 2008).
- Ludwig, S. 2008. New insecticides and pests - What really works. Southeast Greenhouse Conference. Greenville, SC. (June 2008).
- Ludwig, S. 2008. Managing whiteflies and thrips. Southeast Greenhouse Conference. Greenville, SC. (June 2008).
- Ludwig, S. 2008. New insecticides for ornamental pest management. University of Hawaii Cooperative Extension Service. Pearl City, HI. (June 2008).
- Ludwig, S. 2008. East Texas Nursery and Greenhouse IPM Program update. Northeast Texas Nursery Growers Association Monthly Meeting. Overton, TX. (July 2008).
- Ludwig, S. 2008. Entomology update & fire ant management. Pesticide Recertification Training #1. Overton, TX.
- Ludwig, S. 2008. Entomology update & fire ant management. Pesticide Recertification Training #2. Overton, TX.
- Ludwig, S. 2008. Grower’s guide to what is new in insect pest control. BWI Expo. Shreveport, LA. (September 2008)
- Ludwig, S. 2008. Whiteflies in US floriculture. Global Workshop on Stewardship of Neonicotinoid Insecticides. Honolulu, HI, 4 Jun 08.
- Ludwig, S., L. Osborne, C. McKenzie, O. El-Lissy, & L. Schmale. 2008. The coordinated response of industry, regulatory, research, and extension to *Bemisia tabaci* Biotype Q. Southeastern Branch Meeting of the Entomological Society of America. Jacksonville, FL.
- Ludwig, S., L. Osborne, O. El-Lissy, D. Schuble, and L. Schmale. 2008. Q-Tac and Chilli thrips Task Force – USDA. Entomological Society of American Annual Meeting. Reno, NV.
- Ludwig, S. 2008. IPM update. East Texas Nursery and Greenhouse Conference. Tyler. TX.
- Ludwig, S. 2008. Sustainable IPM of insect pests. GrowerTalks Sustainability Conference. Frisco, TX.

- McKenzie, C. L., L. Boykin, R.G. Shatters, Jr., G. Hodges, L.S. Osborne, and F. Byrne. 2008. Extensive Survey of *Bemisia tabaci* Biotypes in Florida – Investigating the “Q” Invasion. Florida Entomological Society Annual Mtg, Jupiter, FL, 16 Jul 08.
- McKenzie, C. L., L. Boykin, R.G. Shatters, Jr., G. Hodges, L.S. Osborne, and F. Byrne. 2008. Extensive Survey of *Bemisia tabaci* Biotypes in Florida – Investigating the “Q” Invasion. Faunistics, Systematics, and Ecology, 3rd European Whitefly Symposium, Almeria, Spain, 21 Oct 2008.
- McKenzie, C. L., Boykin, R. G. Shatters, Jr., G. Hodges, L. S. Osborne, & F. Byrne. Extensive survey of *Bemisia tabaci* biotypes in Florida – investigating the “Q” invasion. . Annual meeting Entomological Society of America. November, 2008 Reno, NV.
- Osborne, L.S., Z. Landa, A. Bohatá, and C. McKenzie. 2008. Invited Keynote Speaker. Potential of entomopathogenic fungus, *Isaria fumosorosea* to protect potted ornamental plants against *Bemisia tabaci* during shipping. IOBC/WPRS Working Group "Integrated Control in Protected Crops, Temperate Climate", Sint Michielsgestel, April 21-25, 2008.
- Osborne, L. S. and S. Ludwig. 2008. "Invited" "Q-Tac and Chilli Thrips -USDA." Entomology Without Borders - The Next Stage in Resistance Management, Symposium. Annual meeting Entomological Society of America. November, 2008 Reno Nevada.
- Osborne, Lance, Joe Chamberlin and Cindy McKenzie. 2008. Managing the Invasive Species Risk. Society of American Florists, Proceedings of the 24th Annual Conference on Pest and Disease Management in Ornamentals. Atlanta Georgia February 2008.
- Osborne, L.S. 2008. Annual CARET Meeting. Tours and presentations on Pest Management in Protected Culture. August, 2008.
- Osborne, L.S. 2008. Tours and Talk on “Pest Management in Greenhouses” Annual Plug Conference and Young Plant Health Committee. September 27, 2008.
- Osborne, L.S. 2008. “IR-4 and Their Role in the Management of Invasive Species”. The IR-4 5 Year Planning Meeting. Washington D.C, December 8-11, 2008.
- Osborne, L. S. 2008. "Invited" "The potential of banker plants in protected culture.”. Symposium: Recent and Current Events in Biocontrol of Arthropods and Weeds in Florida, 2008 Annual meeting of the Florida Entomological Society. July 2008.
- Osborne, L. S. 2008. "Pest Management Update for Ornamental Growers" CEU Day Pierson, Florida. June 17, 2008.
- Osborne, L. S. 2008. “Banker Plants and Biological Control”. Multi-County Master Gardener Meeting. MREC-Apopka, Florida. September 9, 2008.

2009

- Bethke, J. A. 2009. Invading Pests: What to do? San Diego CAPCA’s Nursery Greenhouse Seminar 2009. The Windmill, Carlsbad, CA. June 4, 2009
- Bethke, J. A. 2009. Invasive Species Update. Annual Winter Workshop Series Ontario Workshop, Target Specialty Products, Doubletree Hotel, Ontario, CA. 10-22-09
- Bethke, J. A. 2009. Pest Management in Ornamental Production. Western Regional Meeting of the International Plant Propagators’ Society, San Diego CA. 10-3-09.
- Byrne, F. J., R. A. Oetting, J. A. Bethke, C. and J. Chamberlin. 2009. Understanding the dynamics of neonicotinoid activity in the management of *Bemisia tabaci* whiteflies on poinsettias. 93rd

- Annual Meeting of the Pacific Branch of the Entomological Society of America. Bahia Resort Hotel, San Diego Ca. March 29-April 1, 2009.
- Gilrein, Dan. 2009. Pest Management Update. Long Island Floriculture Conference, January 20, 2009. 80 attendees.
- Gilrein, Dan. 2009. The Entomology Program. Cornell Cooperative Extension of Suffolk County, Agriculture Advisory Committee. Riverhead, NY. 12 attendees.
- Gilrein, Dan. 2009. Pest Posse: Insect Diagnoses on Floriculture Crops Long Island Floriculture Field Day. LIHREC, Riverhead. July 8 – 9, 2009. 20 attendees.
- Gilrein, Dan. 2009. Long Island Horticultural Research and Extension Center Plant Science Day, September 10, 2009. 120 attendees.
- Ludwig, S. 2009. IPM update. East Texas Nursery and Greenhouse Conference. Tyler, TX. Organizer and Presenter. Tyler, TX.
- Ludwig, S. W. 2009. New invasive insects in Texas. Texas Tree Conference. Texas Chapter, International Society of Arboriculture. Oct 1, 2009.
- Ludwig, S. W. 2009. IPM update. East Texas Nursery and Greenhouse Conference. Tyler, TX. Organizer and Presenter. Tyler, TX. Oct 28, 2009.
- Ludwig, S. W. 2009. Natural insecticides in the landscape. Sustainable Landscape Pest Management Conference. Houston, TX. Dec 10, 2009.
- Ludwig, S. 2009. IPM Program update. Joint meeting of the Northeast Texas Nursery Growers Association and Texas Nursery and Landscape Association Region 3. Tyler, TX.
- Ludwig, S. 2009. Strategies for resistance management: Thrips and others. SAF Pest Management Conference. Presenter and Meeting Organizer. San Jose, CA.
- Ludwig, S. 2009. Insect control on greenhouse and nursery crops. East Texas Nursery and Greenhouse IPM Program. 5 meetings: Ft. Worth, Houston, Jacksonville, Canton, and McKinney, TX.
- McKenzie, Cindy. 2009. Biotype Q Whitefly and Chilli Thrips Status in Florida. Agriculture Industry Liaison Committee, U.S. Horticultural Research Laboratory, Fort Pierce, FL May 4, 2009.
- Oetting, Ron. 2009. '*Bemisia tabaci* 'Q' Biotype Management and Susceptibility to Key Insecticides', 5th International *Bemisia* Workshop, Guangzhou, PR China, Nov 9-12, 2009.
- Osborne, L.S. C. Palmer, L. Schmale, S. Ludwig, D. Schuble and C.L. McKenzie. 2009. Managing Invasive Arthropods. 25th Annual Pest Management Conference. February 19-22, 2009. San Jose, California.
- Osborne, L.S. C. 2009. Banker Plants. 25th Annual Pest Management Conference. February 19-22, 2009. San Jose, California.
- Osborne, L.S. and C.L. McKenzie. 2009. Responding to Invasive Species that Threaten Existing IPM Systems (Whitefly as a Model). Third ARS Floriculture and Nursery Review Meeting. October 12-17, 2009. Cleveland, Ohio.
- Osborne, L.S. Banker Plants and Biological Control. Annual Meeting of Zoo Horticulturists. September 30, 2009. Jacksonville, Florida.
- Osborne, L.S. 2009. Extensions' response to unknown or potentially regulated pests. Entomological Society of America, Annual Meeting, December 13-16, 2009. Indianapolis, Indiana.
- Osborne, L.S. 2009. Banker Plant Concepts. In-Service Training for Extension Agents. March 20, 2009. Apopka, Florida.

- Osborne, L.S., S.E. Webb and W. L. Laughlin. 2009. IPM and Biological Control..Given 16 times. Advanced Topics In Hydroponics. November 13-14, 2009 Live Oak, Florida.
- Webb, S.E., L.S. Osborne, and W. L. Laughlin. 2009. Common Vegetable Pests: Identification and Morphology. Given 16 times..Advanced Topics In Hydroponics. November 13-14, 2009 Live Oak, Florida.

2010

- Avery, Pasco B., Vitalis W. Wekesa, Wayne B. Hunter, David G. Hall, Cindy L. McKenzie, Lance L. Osborne, Charles A. Powell, and Michael E. Rogers. 2010. *Invited* "Multitrophic interactions of *Isaria fumosorosea*: to reduce the spread of citrus disease, Huanglongbing". Symposium on Multitrophic Interactions: Concepts and Applications Jupiter, FL July 27, 2010.
- Gilrein, Dan. 2010. Entomology Update: Managing thrips and other arthropod pests Capital District Bedding Plant Conference, January 7, 2010. 84 attendees.
- Gilrein, Dan. 2010. Nursery and Greenhouse Crops Insect Update. Hudson Valley Nursery and Greenhouse Growers' School, January 8, 2010. 64 attendees.
- Gilrein, Dan. 2010. Current Pest and Pest Management Issues for Greenhouse Growers. Long Island Agriculture Forum, Greenhouse Session/, January 14, 2010. 15 attendees.
- Gilrein, Dan. 2010. News and Notes From the CCE Entomology Lab. Long Island Floriculture Conference, January 19, 2010. 75 attendees.
- Kumar, Vivek, Dakshina R. Seal, David J. Schuster, Lance Osborne, Cindy. L. McKenzie and Garima Kakkar. 2010. Optimizing abiotic conditions for higher efficacy of fungal pathogens against chilli thrips, *Scirtothrips dorsalis* Hood. Annual meeting of Caribbean Food Crops Society. July 11- 17, 2010, Dominican Republic.
- Kumar, Vivek, Dakshina R. Seal, David J. Schuster, Lance Osborne, Cindy McKenzie and arima Kakkar. 2010. "Influence of abiotic factors on activity of three fungal pathogens regulating chilli thrips, *Scirtothrips dorsalis* (Thysanoptera: Thripidae) on pepper". Annual FL Entomol Society Meeting, Jupiter, FL, July 26, 2010.
- Kumar, Vivek, Dakshina R. Seal, David J. Schuster, Cindy. L. McKenzie and Garima Kakkar. 2010. Standardizing cultural practices for enhanced activity of three entomopathogens in regulating chilli thrips, *Scirtothrips dorsalis* Hood on pepper. Florida Ag-Expo 2010, GCREC-UF. Wimauma, Florida.
- Kumar, Vivek, Dakshina R. Seal, David J. Schuster, Lance Osborne, Cindy. L. McKenzie and Garima Kakkar. 2010. *In vitro* effect of selected fungicides on three species of entomopathogenic fungi. Annual meeting of Entomological Society of America, December 12-15. San Diego, California, USA.
- Ludwig, S. W. 2010. ID/Control, Landscape/Nursery Insect Pests and Reducing Economic Impact on You. North Texas Mid-Winter Green Industry Symposium. Dallas, TX. Jan 26, 2010.
- Ludwig, S. W. 2010. Managing Troublesome Pests. Southeast Texas Nursery Growers Association Trade Show. Conroe, TX. Jan 30, 2010.
- Ludwig, Scott and Lance Osborne. 2010. *Invited* "Thrips management". Society of American Florists, 26th Annual Pest and Production Management Conference (P&PMC). Orlando, FL. Feb 26, 2010.
- Ludwig, S., P. Nester, A. Camerino, and C. Brouwer. 2010. Evaluation of *Scirtothrips dorsalis* Management Techniques. Southwestern Branch Meeting of the Entomological Society of America. Cancun, Mexico. Apr 13, 2010.

- Ludwig, S. W. 2010. Integrating Pest Management in the Rose Garden: Including Chilli Thrips. American Rose Society Rose Show and Convention. Shreveport, LA. May 1, 2010.
- Ludwig, S. W. 2010. Update on New Pests and Their Management. Texas Nursery and Landscape Association Pre-Expo. San Antonio, TX. Aug 19, 2010.
- Ludwig, S. W. 2010. University Extension Research and IPM. Biopesticide Industry Alliance. Sacramento, CA. Sep 30, 2010.
- McKenzie, Cindy and Cristi Palmer. 2010. *Invited* "Whitefly Management". Society of American Florists, 26th Annual Pest and Production Management Conference (P&PMC). Orlando, FL. Feb 27, 2010.
- McKenzie, Cindy, Cristi Palmer, Lance Osborne, Scott Ludwig, and Ron Oetting 2010. *Invited* "Chemical Class Rotations for Control of *Bemisia tabaci* on Poinsettia". Symposium on Innovative Arthropod Management Solutions, Florida Entomological Society, Jupiter, FL July 27, 2010.
- McKenzie, Cindy, Greg Hodges, Lance S. Osborne, Frank J Byrne, and Robert G. Shatters, Jr. 2010. *Invited* "Investigating the Q invasion of *Bemisia tabaci* in Florida: Current Status and Update" at the 2010 Florida Tomato Institute, hosted by the University of Florida, IFAS Extension, Naples, FL Sept 8, 2010.
- Oetting, Ron. 2010. *Bemisia*, B vs. Q. South East Entomologist Workshop at the Mid Florida Research and Education Center in Apopka, Florida on May 13-14, 2010.
- Osborne, L.S. 2010. "Newest Pest Control Compounds and Integration Methods". This included biological control and banker plants. In Service Training for Extension Agents. Broadcast Statewide from Gainesville, FL Feb 4, 2010.
- Osborne, L.S. 2010. Tour and Talks about Whitefly and Thrips Research including Banker Plants. University of Florida, Department of Entomology and Nematology, Biological Control Course. Apopka, FL Feb 13, 2010.
- Osborne, L.S. 2010. "Biological Control and Banker Plants". University of Florida, Department of Horticulture, Advanced Hydroponics Course. Citra, FL. Feb 18, 2010.
- Osborne, L.S. 2010. Tour and Talks about Whitefly and Thrips Research including Banker Plants. The 26th Annual Pest & Production Management Conference (P&PMC). Apopka, FL. Feb 25, 2010.
- Osborne, L.S. 2010. Banker Plants (4 sessions). The 26th Annual Pest & Production Management Conference (P&PMC). Orlando, FL. Feb 26 2010.
- Osborne, L.S. 2010. Mite Biological Control and Banker Plants (16 sessions). The 26th Annual Pest & Production Management Conference (P&PMC). Orlando, FL. Feb 26 2010.
- Osborne, L.S. 2010. "Banker Plants". Annual Pest Management Update. Broad Cast Statewide via Polycom. Apopka, FL. Mar 9 2010.
- Osborne, L.S. 2010. "Dealing with thrips, whiteflies and mites". Fern CEU Day, Pierson, FL. Jun 8 2010.
- Osborne, L.S. 2010. "Biological Control Issues in the Florida Ornamental Industry". Annual meeting of the Florida Biological Control working group. Apopka, FL. Jun 21 2010.
- Osborne, L.S, Cindy McKenzie and Lin Schmale. 2010. *Invited* "Responding to Invasive Species that Threaten American Agriculture (Whitefly as a Model)". The Ohio Florists Short Course. Columbus, OH. July 10, 2010.
- Osborne, Lance S., Cindy McKenzie, Pasco Avery, and Yingfang Xiao. 2010. *Invited* "IPM in Florida Greenhouses". Flowers Canada Research Conference, Niagra Falls, Ontario, CA. August 26-27, 2010.

- Osborne, Lance S., Cindy McKenzie, Cristi Palmer, Scott Ludwig, Ron Oetting, *Pasco Avery*, and *Yingfang Xiao*. 2010. *Invited* “Dealing with Invasives”. Flowers Canada Research Conference, Niagra Falls, Ontario, CA. August 26-27, 2010.
- Osborne, L.S. 2010. *Invited* “More than you wanted to know about Chilli Thrips”. Central Florida Heritage Rose Society. Florida Southern College, Lakeland, FL. September 12, 2010.
- Osborne, Lance S., Scott Ludwig, Cindy McKenzie, and Cristi Palmer. 2010. *Invited* “What’s Not So Hot about Chilli Thrips”. Canadian Greenhouse Conference ’10. Toronto, Ontario, CA. October 6, 2010.
- Osborne, Lance S., Cindy McKenzie, Joe Chamberlin, Lin Schmale, Scott Ludwig, Amanda Hodges, and Robert G. Shatters. 2010. “Managing the Invasive Species Risk in the Ornamental Industry”. Potential Invasive Species Workshop. Miami, Florida. October 11, 2010.

2011

- Kumar V., D. R. Seal, D. J. Schuster, L. Osborne, C. L. McKenzie and G. Kakkar. 2011. A New report on abundance of chilli thrips, *Scirtothrips dorsalis* (Thysanoptera: Thripidae) on fruit hosts in south Florida. Annual Meeting of Southeastern Branch of the Entomological Society of America, March 19-22, 2011. San Juan, Puerto Rico.
- Kumar V., D. R. Seal, C. L. McKenzie, D. J. Schuster, L. Osborne, C. Powell and G. Kakkar. 2011. Preventive and curative control of chilli thrips *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae) using various regimes of biological and chemical insecticides. 94th Annual meeting of Florida Entomological Society, July 24-27, 2011. Sanibel, Florida. USA.
- Kumar V., D. R. Seal, D. J. Schuster, L. Osborne, and C. L. McKenzie. 2011. Coupling scanning electron microscopy with DNA bar coding for morphological and molecular identification of thrips. Annual meeting of Entomological Society of America, November 13-16. Reno, Nevada, USA.
- McKenzie, Cindy. 2011. “*Bemisia tabaci* Biotypes: History, Importance, and Current Status in Florida”, Whitefly Workshop for Landscape Professionals, Town of Palm Beach Council Chambers, Palm Beach, FL July 18, 2011.
- McKenzie, Cindy. 2011 *Invited*. “Whiteflies in Tomatoes: A Florida Perspective”, Symposium-Industry: Advances in Vegetable Entomology Research in Florida: A Tribute to the Research Programs of Dr. Dave Schuster, Florida Entomological Society, Sanibel, FL July 25, 2011.
- McKenzie, Cindy. 2011 *Invited*. “Research Needs for Invasive Species in Florida, (*Bemisia tabaci*, Q Biotype)”, Symposium: Invasive Species: Are We Communicating?” Florida Entomological Society, Sanibel, FL July 25, 2011.
- McKenzie, Cindy Vivek Kumar, Dak Seal, & Lance Osborne. 2011. *Invited* “A Novel Technique for Direct Correlation of Traditional Morphological Taxonomy with Molecular DNA Barcoding for Identification of Chilli Thrips Using Scanning Electron Microscopy”, Symposium: Chilli Thrips: Current Status and Future Challenges, Florida Entomological Society, Sanibel, FL July 25, 2011.
- Osborne, L.S. 2011. Banker Plants – systems that work for specific pests. Update on Banker Plants for Nursery Production – a PolyCom “Broadcast” program on the use of banker plants and biological controls in nurseries to Extension Offices around the State. January 12, 2011.
- Osborne, L.S. and K.S. Houben. 2011. How to grow your own predators/banker plants. Update on Banker Plants for Nursery Production – a PolyCom “Broadcast” program on the use of

- banker plants and biological controls in nurseries to Extension Offices around the State. January 12, 2011.
- Osborne, L.S. 2011. Banker Plants Explained. Society of American Florists, Proceedings of the 26th Annual Pest and Production Management Conference (P&PMC) XXVI: 50-53. February 24, 2011.
- Osborne, L.S. 2011. Banker Plants, mite and whitefly control. CEU Day, Volusia Cut Foliage Grower Association. Pierson, Florida. April 6, 2011.
- Osborne, L.S. Beneficial Arthropod Rearing: Banker plants and open rearing systems. A PolyCom “Broadcast” program to 10 County Extension offices. June 7, 2011.
- Osborne, L.S. Onsite training of extension agents and master gardener trainers on producing natural enemies using banker plants and open rearing systems. Palm Beach County Extension Office. June 20, 2011.
- Osborne, L.S. 2011. Predatory Mite Quality Control and the Use of Banker Plants to Assess Quality. Biological Control Working Group. Apopka, Florida. June 21, 2011.
- Osborne, L.S. 2011. Mite Management. Apopka, Florida. June 23, 2011.
- Osborne, L.S. 2011. Mite Management. Homestead, Florida. July 19, 2011. St. Petersburg, FL.
- Osborne, L.S., C.L. McKenzie, Y. Xiao, P. B. Avery, and J. Chen. 2011. Ornamental Pepper: A Potential Banker Plant for Establishment of *Amblyseius swirskii* (Acari: Phytoseiidae) to Manage Chilli Thrips. Florida Entomological Society Annual Mtg, Jupiter, FL, July 25.
- Osborne, L.S. 2011. Mite Management. Balm, Florida. Aug. 18, 2011.
- Osborne, L.S. 2011. Insect Management in Commercial Florida Greenhouses. U.S. Nursery Certification Program. Apopka, Florida. August 12, 2011.
- Osborne, L.S. 2011. What’s New in IPM. Keynote Address. Florida Master Gardener Continued Training Conference. Orlando, Florida. October 24, 2011.
- Osborne, L.S. 2011. Using banker plants in Florida greenhouses. Entomological Society of America Annual Meeting. Reno, NV. November 13-16, 2011.
- Osborne, L.S., C.L. Palmer, S.W. Ludwig. 2011. Development of the thrips management program for ornamental horticulture. Entomological Society of America Annual Meeting. Reno, NV. November 13-16, 2011.
- Popenoe, Juanita. 2011. What we have learned in nursery trials. Update on Banker Plants for Nursery Production – a PolyCom “Broadcast” program on the use of banker plants and biological controls in nurseries to Extension Offices around the State. January 12, 2011.
- Popenoe, J., W. Schall, L. Osborne. (poster). 2011. Countertop Production of Predatory Mites for Public Distribution. Florida Central District Extension Faculty Symposium. Kissimmee, FL. April 28, 2011.
- Popenoe, J., (presenter), W. Schall, L. Osborne. 2011. Countertop Production of Predatory Mites for Public Distribution. Florida State Horticulture Society annual meeting. June 5-7, 2011. St. Petersburg, FL.
- Popenoe, J. & L.S. Osborne. 2011. Banker plants for nursery production. Rose IPM and Production. A PolyCom “Broadcast” Statewide. July 22, 2011.
- Schall, W., J. Popenoe, L. Osborne, S. Brown, B. Burn, L. Singleton, J. Davis, D. Culbert, T. DelValle; E. Harlow, D. Levulis, C. Saft, 2011. Beneficial Arthropod Rearing by Master Gardener Programs for Public Distribution. Extension Professional Associations of Florida 2011 Professional Improvement Meeting Lake Buena Vista, Florida. Aug. 31, 2011.
- Xiao, Y., L.S. Osborne (Presenter), J. Chen, C. McKenzie, P.B. Avery, K.S. Houben, and F. Irizarry. 2011. Ornamental pepper: a potential banker plants for augmentation of predatory

mites, *Amblyseius swirskii* (Acari: Phytoseiidae). Entomological Society of America Annual Meeting. Reno, NV. November 13-16.

Xiao, Y., L.S. Osborne (Presenter), J. Chen, C. McKenzie, K.S. Houben, and F. Irizarry. 2011. A potential banker plant for management of *Tetranychus urticae* (Acari: Tetranychidae) by augmenting *Feltiella acarisuga* (Diptera: Cecidomyiidae) in greenhouse vegetables. Entomological Society of America Annual Meeting. Reno, NV. November 13-16.

2012

Avery, P. B., Guerrero, S., Hodges, A. C, Powell, C. A. and L. S. Osborne. 2012. Efficacy and infectivity of *Isaria fumosorosea* for controlling Madeira mealybug, *Phenacoccus madeirensis* on plants for shipping. 60th Annual Meeting of the Entomological Society of America, Knoxville TN November 11-14, 2012.

Avery P., Skvarch, E., Goodiel, Y., McKenzie, C. L. and L. Osborne. Efforts to develop an IPM program for rugose spiraling whitefly in the Jensen Beach area. Rugose Spiraling Whitefly meeting, Island Club of Hutchinson Island. Jensen Beach, FL, July 18, 2012.

Buss, E., S. Arthurs, and L.S. Osborne. 2012. Aphids, hoppers, psyllids, and bugs – Identification of key pests and damage; hands-on activity. In-Service Training on “Horrible Hemiptera Identifying and Managing Important Hemiptera Pests of Turf and Ornamentals”. May 2, 2012. Apopka, Florida.

Dickey, A. M., Osborne, L. S., Shatters Jr., R. G., McKenzie, C. L. 2012. Isothermal amplification of insect DNA. International IPM Symposium, Memphis TN March 27-29, 2012.

Dickey, A. M., Osborne, L. S., Shatters Jr., R. G., McKenzie, C. L. 2012. LAMP: a technique for biotype discrimination in *Bemisia tabaci*. Annual Meeting Florida Entomological Society, Jupiter FL 22-25 July, 2012.

Dickey, A. M., Osborne, L. S., Hall, P. M., Shatters Jr., R. G., McKenzie, C. L. 2012. Evolution and homoplasy at the *bem6* microsatellite locus in three *Bemisia tabaci* cryptic species. Annual Meeting Entomological Society of America, Knoxville TN November 11-14, 2012.

Dickey, A. M., Osborne, L. S., Kumar, V., Shatters Jr., R. G., McKenzie, C. L. Haplotype analysis of global chili thrips (*Scirtothrips dorsalis*) populations using the metazoan barcode. 2012. Annual Meeting Entomological Society of America, Knoxville TN 11-14 November, 2012.

Goodiel, Y., Avery, P., Hodges, A., Kumar, V., Mannion, C., McKenzie, C., Osborne, L., E. Skvarch. A collaborative effort to address whitefly issues in Florida. EPAF’s Educational Table Top Exhibits, Okeechobee, FL, August 27-29, 2012.

Guerrero, Sarahlyne, A. Hodges, L. Osborne, and P. Avery. 2012. Efficacy of *Isaria fumosorosea* (= *Paecilomyces fumosorosea*) and horticultural oil on cuttings infested with the Madeira mealybug, *Phenacoccus madeirensis* Green. 96th Annual Meeting of the Florida Entomological Society 2012, Jupiter, FL, July 22-24, 2012.

Kumar V., Kakkar, G., Seal D. R., McKenzie C. L., and Osborne L. 2012. Chili thrips, *Scirtothrips dorsalis*: A potential threat to cotton production in the USA. Beltwide cotton conference, January 4-7. Orlando, Florida, USA.

Kumar, V., Avery P., Skavarch, E., Goodiel, Y., McKenzie, C. L. and L. Osborne. Efforts to develop an IPM program for rugose spiraling whitefly in the Jensen Beach area. Rugose Spiraling Whitefly Meeting, Island Club of Hutchinson Island. Jensen Beach, FL, July 18, 2012.

- Kumar V., Kakkar, G., Seal D. R., McKenzie C. L., and Osborne L. 2012. Assessing abundance and damage potential of an invasive thrips species *Scirtothrips dorsalis* (Thysanoptera: Thripidae) in south Florida. Annual Meeting of South-eastern Branch of the Entomological Society of America, March 4-7, 2012, Little Rock, Arkansas, USA.
- McKenzie, C. L., Bethke, J. A., Byrne, F. J., Chamberlin, J. R., Dennehy, T. J., Dickey, A., Gilrein, D., Hall, P. M., Ludwig, S., Oetting, R. D. et al: 2012. Distribution of *Bemisia tabaci* (Hemiptera: Aleyrodidae) biotypes in North America following the Q invasion. Southeastern Branch/Southwestern Branch of the Entomological Society of America, Little Rock, AK, March 4-7, 2012.
- McKenzie, C. L., Bethke, J. A., Byrne, F. J., Chamberlin, J. R., Dennehy, T. J., Dickey, A., Gilrein, D., Hall, P. M., Ludwig, S., Oetting, R. D. et al: 2012. Distribution of *Bemisia tabaci* (Hemiptera: Aleyrodidae) biotypes in North America following the Q invasion. Annual Meeting Florida Entomological Society, Jupiter FL July 22-25, 2012.
- Kumar, V., Avery P., Skavarch, E., Goodiel, Y., McKenzie, C. L. and L. Osborne. Efforts to develop an IPM program for rugose spiraling whitefly in the Jensen Beach area. Rugose Spiraling Whitefly Meeting, Island Club of Hutchinson Island. Jensen Beach, FL, July 18, 2012.
- Osborne, L.S. 2012. Whitefly meetings with local extension agents, press, public officials and pest control companies: continuous effort with at least 2 per month throughout most of the year.
- Osborne, L.S. 2012. Foliage Plant Entomology Program at MREC, University of Florida. Society of American Florists 2012 Pest and Production Management Conference. Tour- talks given multiple times. Apopka Florida. February 16.
- Osborne, L.S., Yingfang Xiao, J. Chen, and Cindy McKenzie. 2012. Using Banker Plants to Control Insects. Society of American Florists 2012 Pest and Production Management Conference. Orlando, Florida. February 16-18.
- Osborne, L.S. 2012. New Faculty Tour of MREC Multiple talks and tours. April 11, 2012.
- Osborne, L.S. 2012. MREC Open House. Multiple talks and tours. April 19, 2012.
- Osborne, L.S. 2012. National Webinar on Developments in Biological Insecticides. April 19, 2012.
- Osborne, L.S. and C. Mannion. 2012. Whiteflies – Identification of key pests and damage; hands-on activity. In-Service Training on “Horrible Hemiptera Identifying and Managing Important Hemiptera Pests of Turf and Ornamentals”. May 2, 2012. Apopka, Florida.
- Osborne, L.S. E. Buss, and C. Mannion. 2012. Scales/Mealybugs – Identification of key pests and damage; hands-on activity. In-Service Training on “Horrible Hemiptera Identifying and Managing Important Hemiptera Pests of Turf and Ornamentals”. May 2, 2012. Apopka, Florida.
- Osborne, L.S. and C. Mannion. 2012. Whiteflies – Managing Hemiptera in production (nursery, greenhouse). In-Service Training on “Horrible Hemiptera Identifying and Managing Important Hemiptera Pests of Turf and Ornamentals”. May 2, 2012. Apopka, Florida.
- Osborne, L.S. Biological and Chemical Insect Control in Greenhouses. Florida Small Farms and Alternative Enterprises Conference. Kissimmee, Florida. July 28, 2012.
- Osborne, L.S. & Hugh Smith. 2012. GOOD BUG, BAD BUG ID. Florida Small Farms and Alternative Enterprises Conference. Kissimmee, Florida. July 29, 2012.
- Osborne, L.S. 2012. Mite Management. Homestead, Florida. July 31, 2012.
- Osborne, L.S. 2012. Whitefly and Mite Resistance Management. Balm, Florida. August 1, 2012.
- Osborne, L.S. 2012. Whitefly and Mite Resistance Management. Apopka, Florida. August 2, 2012.

- Osborne, L.S. 2012. Central Florida Green Team Meeting. Invasive Species Update. MREC. October 5, 2012.
- Osborne, L.S. 2012. Invasive Whitefly Update for the Brevard County Extension and Clientele. Brevard County Library. October 10, 2012.
- Osborne, L.S. 2012. New Invasives. Fern Growers CEU Day. Volusia County. October 24, 2012.
- Osborne, L.S. 2012. Whitefly Summit for Vegetable Transplant Producers. Sun City, Florida. November 6, 2012.
- Osborne, L.S. 2012. Are resistant pests more of a threat than new invasive species in ornamentals? Entomological Society of America Annual Meeting. Knoxville, Tennessee. November 11-14.
- Osborne, L.S., and C. L. McKenzie. 2012. Whitefly Update. Palm Beach County. December 19, 2010.

2013

- Aristizabal, L.F., Avery, P.B., Kumar, V., Caldwell, J.H., McKenzie, C.L., Osborne, L.S. 2013. Pre shipping dip treatments using soap, natural oils, and *Isaria fumosorosea*: potential biopesticides for mitigating the spread of whitefly *Bemisia tabaci* (Hemiptera: Aleyrodidae) invasive insects on ornamental plants [abstract]. Florida Entomological Society Annual Meeting, Naples, FL, July 15, 2013.
- Avery, P.B., McKenzie, C.L., Powel, C.A., Osborne, L.S. 2013. Efficacy of *Isaria fumosorosea* Wize (Hypocreales: Cordycipitaceae) on the leaf phylloplane over time for controlling Madeira mealybug nymphs preshipping. 77th Annual Meeting of the Florida Academy of Sciences, Barry University, Miami Shores, FL, March 8, 2013.
- Dickey, A.M., Trease, A., Jara, A., Kumar, V., Christenson, M.K., Portluri, P., Morgan, J.K., Shatters, R.G., Jr., Davis, P.H., McKenzie, C.L., Osborne, L.S. 2013. Next-generation DNA sequencing of the globally invasive plant pest, *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae). Florida Entomological Society Annual Meeting, Naples, FL, July 16, 2013.
- Dickey, A., Osborne, L.S., Shatters, R.G., Jr., Hall, P.M., McKenzie, C.L. 2013. Population genetics of invasive *Bemisia tabaci* cryptic species in the US based on microsatellite markers. Annual Meeting of the Entomological Society of America, Austin, TX, November 12, 2013.
- Kumar, V., Wekesa, V., Avery, P.B., Powell, C.A., McKenzie, C.L., Osborne, L.S. 2013. Effect of different ornamental pepper pollens on the development and reproduction of *Amblyseius swirski* (Acari: Phytoseiidae). Southeastern Branch of Entomological Society of America Annual Meeting, Baton Rouge LA, March 5, 2013.
- Kumar, V., Kakkar, G., Seal, D.R., McKenzie, C.L., Osborne, L.S. 2013. Vertical and horizontal distribution and seasonal dynamics of an invasive thrips species, *Scirtothrips dorsalis* (Thysanoptera: Thripidae) in south Florida. 77th Annual Meeting of the Florida Academy of Sciences, Barry University Miami Shores, FL, March 8, 2013.
- McKenzie, C.L., Dickey, A., Osborne, L.S., Kumar, V., Shatters, R.G., Jr. 2013. Haplotype analysis of global chilli thrips (*Scirtothrips dorsalis*) populations using the metazoan barcode. Florida Entomological Society Annual Meeting, Naples, FL, July 16, 2013.
- McKenzie, C.L., Kumar, V., Palmer, C.L., Oetting, R.D., Osborne, L.S. 2013. Chemical class rotations for control of *Bemisia tabaci* (Hemiptera: Aleyrodidae) on poinsettia and their

- effect on cryptic species population composition. Annual Meeting of the Entomological Society of America, Austin, TX, November 13, 2013.
- Oetting, R., McKenzie C., and Townsend M. 2013. Efficacy of insecticide rotations and their impact on populations of the 'B' and 'Q' biotypes of *Bemisia tabaci*. First International whitefly symposium, Kolybari, Crete, Greece, May 23, 2013.
- Wilkerson, M., Hix, R.L., Dickey, A.M., McKenzie, C.L. 2013. Characterizing population and genetic structure of *Aleurodicus rugioperculatus* Martin (Hemiptera:Aleyrodidae) in Florida. Southeastern Branch of Entomological Society of America Annual Meeting, Baton Rouge LA, March 4, 2013.
- Xiao, Y., Osborne, L., McKenzie, C.L., Chen, J. 2013. Influence of diet conditions on predation response of a predatory mite to a polyphagous insect pest. 77th Annual Meeting of the Florida Academy of Sciences, Barry University Miami Shores, FL, March 8, 2013.
- Xiao, Y., Osborne, L.S., McKenzie, C.L., Kumar, V., Chen, J., Taravati, S. 2013. Giant whitefly (*Aleurodicus dugesii*) as a surrogate for evaluating the parasitoid wasp (*Encarsiella noysei*) for biological control of Rugose spiraling whitefly (*Aleurodicus rugioperculatus*). Florida Entomological Society Annual Meeting, Naples, FL, July 15, 2013.

**Evolving and Integration of Management Plans for Major Taxonomic Groups and
Potential New Invasive Pests in Ornamental and Floriculture Production
Agreement # 58-6618-3-029**

**Cumulative Publications and Presentations
Start Sept 16 2013 to Sept 15 2018**

FNRI project funded nine postdocs (italics) over the life of the NACA and are indicated in italics in the references: *Luisa Cruz, Aaron Dickey, Ismail Doker, Paula Hall, Garima Kakkar, Vivek Kumar, Avery Pasco, Vitalis Wekesa, Yingfang Xiao*. Collectively this team has published 27 refereed publications, 40 other publications and made over 100 presentations.

Refereed Publications (27)

1. *Xiao, Y., Osborne, L., Chen, J., McKenzie, C.L.* Functional responses and prey-stage preferences of a predatory gall midge and two predacious mites with twospotted spider mites, *Tetranychus urticae*, as host. *Journal of Insect Science*. 13:8. 2013. Available: <http://www.insectscience.org/13.8>
2. *Dickey, A., Osborne, L.S., Shatters, Jr., R.G., Hall, P., and McKenzie, C.L.* Population genetics of invasive *Bemisia tabaci* cryptic species in the United States based on microsatellite markers. *Journal of Economic Entomology*. 106(3): 1355-1364. 2013. Available: <http://dx.doi.org/10.1603/EC12512>.
3. *Dickey, A., Hall, P.M., Shatters Jr., R.G., and McKenzie, C.L.* Evolution and homoplasy at the Bem6 microsatellite locus in three sweet potato whitefly (*Bemisia tabaci*) cryptic species. *BioMed Central Research Notes* 6:249. 2013. Available: <http://www.biomedcentral.com/1756-0500/6/249>
4. *Dickey, A.M., Osborne, L.S., Shatters, Jr., R.G., and McKenzie, C.L.* Identification of the MEAM1 cryptic species of *Bemisia tabaci* (Hemiptera: Aleyrodidae) by loop-mediated isothermal amplification. *Florida Entomologist*. 96(3):756-764. 2013.
5. *Kumar, V., Kakkar, G., Seal, D.R., McKenzie, C.L., Colee, J., and Osborne, L.* Temporal and spatial distribution of an invasive thrips species *Scritothrips dorsalis* (Thysanoptera: Thripidae). *Crop Protection*. 55:80-90. 2014. Available: <http://dx.doi.org/10.1016/j.cropro.2013.10.015>
6. *Avery, P.B., Kumar, V., Xiao, Y., Powell, C.A., McKenzie, C.L., and Osborne, L.S.* Selecting an ornamental pepper banker plant for *Amblyseius swirskii* in floriculture crops. *Arthropod Plant Interactions*. 8:49-56. 2014. Available: <http://dx.doi.org/10.1007/s11829-013-9283-y>.
7. *McKenzie, C.L., Kumar, V., Palmer, C.L., Oetting, R.D., and Osborne, L.S.* Chemical class rotations for control of *Bemisia tabaci* (Hemiptera: Aleyrodidae) on poinsettia and their effect on cryptic species population composition. *Pesticide Management Science*. 70:1573-1587. 2014. Available online: <http://onlinelibrary.wiley.com/doi/10.1002/ps.3736/pdf>

8. Xiangfeng, J., Wong, A., Chaston, J.M., Colvin, J., McKenzie, C.L., and Douglas, A.E. The bacterial communities in a plant phloem sap feeding insect. *Molecular Ecology*. 23:1433-1444. 2014. Available: <http://doi:10.1111/mec.12637>
9. Dickey, A. M., Trease, A. J., Jara-Cavieres, A., Kumar, V., Christenson, M. K., Potluri, L.-P., Morgan, J.K., Shatters, R.G., Jr., McKenzie, C.L., Davis, P.H., and Osborne, L.S. Estimating bacterial diversity in *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae) via next generation sequencing. *Florida Entomologist*. 97(2): 362-366. 2014.
10. Kumar, Vivek, Seal, D. R., Osborne, L. and McKenzie, C. L. Coupling scanning electron microscopy with DNA bar coding: A novel approach for thrips identification. *Applied Entomology and Zoology*. 49:403-409. 2014.
11. Kumar, V., Wekesa, V. W., Avery, P. B., Powell, C.A., McKenzie, C. L., and Osborne, L.S. Effect of different ornamental pepper pollen on the development and reproduction of *Amblyseius swirskii* (Acari: Phytoseiidae). *Florida Entomologist* 97(2): 367-373. 2014
12. Dickey A. M., Kumar V., Hoddle M. S., Funderburk J. E., Morgan J. K., Jara-Cavieres A., Shatters, Jr., R. G., Osborne, L. S., McKenzie, C. L. The *Scirtothrips dorsalis* Species Complex: Endemism and Invasion in a Global Pest. *PLoS ONE* 10(4): e0123747. 2015. doi:10.1371/journal.pone.0123747
13. Dickey, A. M., Stocks, I.C., Smith, T., Osborne, L. S., and McKenzie, C. L. DNA barcode development for three recent exotic whitefly (Hemiptera: Aleyrodidae) invaders in Florida. *Florida Entomologist*. 98(2): 473-478. 2015.
14. Kumar, V., Xiao, Y., McKenzie, C. L., and Osborne, L.S. Early establishment of the phytoseiid mite *Amblyseius swirskii* (Acari: Phytoseiidae) on pepper seedlings in a Predator-In-First approach. *Experimental and Applied Acarology*. 65(1): 465-481. 2015.
15. Dickey, Aaron M., Kumar, Vivek, Morgan, J. Kent, Jara-Cavieres, Antonella, Shatters, Jr., Robert G., McKenzie, Cindy L., Osborne, Lance S. A novel mitochondrial genome architecture in thrips (Insecta: Thysanoptera): extreme size asymmetry among chromosomes and possible recent control region duplication. *BMC Genomics*. 16:439. 2015. doi:10.1186/s12864-015-1672-4.
16. Taravati, Siavash, Mannion, Catharine, Osborne, Lance, McKenzie, Cindy L. Feeding and development of *Nephaspis oculata* (Coleoptera: Coccinellidae) on rugose spiraling whitefly. *Florida Entomologist*. 99(3): 516-521. 2016.
17. Smith, Hugh A., Nagle, Curtis A., MacVean, Charles A., McKenzie, Cindy L. Susceptibility of *Bemisia tabaci* MEAM1 (Hemiptera: Aleyrodidae) to imidacloprid, thiamethoxam, dinotefuran and flupyradifurone in south Florida. *Insects*. 7, 57. 2016. doi:10.3390/insects7040057.

18. Thomson, Majesh, Sahavaraj, Kitherian, Kumar, Vivek, Avery, Pasco B., McKenzie, Cindy L., Osborne, Lance S. Mass rearing and augmentative biological control evaluation of *Rhynocoris fuscipes* (Hemiptera: Reduviidae) against multiple pests of cotton. *Pest Management Science*. 73(8):1743-1752. 2017. doi: 10.1002/ps.4532.
19. McKenzie, Cindy L. and Osborne, Lance S. *Bemisia tabaci* MED (Q biotype) (Hemiptera: Aleyrodidae) is on the move in Florida to residential landscapes and may impact open field agriculture. *Florida Entomologist*. 100(2): 481-484. 2017.
20. Kumar, Vivek, Kakkar, Garima, Seal, Dakshina R., McKenzie, Cindy L., Osborne, Lance S. Evaluation of insecticides for curative, preventative and rotational use against chilli thrips *Scirtothrips dorsalis* South Asia 1 (Thysanoptera: Thripidae). *Florida Entomologist*. 100(3):634-646. 2017.
21. Kumar, V., Dickey, A.M., Seal, D.R., Shatters, R.G., Jr., Osborne, L.S., and McKenzie, C.L. Unexpected high intragenomic variation in two of three major pest thrips species does not affect ribosomal internal transcribed spacer 2 (ITS2) utility for thrips identification. *International Journal of Molecular Sciences* 18, 2100. 2017. doi: 10.3390/ijms18102100.
22. Kumar, Vivek, Avery Pasco, Ahmed, Juthi, Cave, Ron, McKenzie, Cindy L., Osborne, Lance, S. Compatibility and efficacy of *Isaria fumosorosea* with horticultural oils for mitigation of the Asian Citrus Psyllid, *Diaphorina citri* (Hemiptera: Liviidae). *Insects* 8, 119. 2017. <http://dx.doi.org/10.3390/insects8040119>.
23. Aristizabal, Luis, Pasco, Avery, Kumar, Vivek, Caldwell, Jean, McKenzie, Cindy L., Osborne, Lance, S. Mitigating trans-boundary movement of *Bemisia tabaci* (Hemiptera: Aleyrodidae) on *Mentha* sp. by pre-shipping treatments of biopesticides. *Crop Protection* 107: 71-78. 2018. <https://doi.org/10.1016/j.cropro.2018.01.015>
24. Kumar, Vivek, Francis, Antonio, Avery Pasco, McKenzie, Cindy L., Osborne, Lance, S. Assessing compatibility of *Isaria fumosorosea* and buprofezin for mitigation of *Aleurodicus rugioperculatus* (Hemiptera: Aleyrodidae) - an invasive pest in the Florida landscape. *Journal of Economic Entomology* 111(3):1069-1079. 2018.
25. Sahayaraj, Kitherian, Kumar, Vivek, Banu, Nazeera, Avery, Pasco, Radhika, Anbu, McKenzie, Cindy, Osborne, Lance. Predation potential of *Rhynocoris marginatus* (Hemiptera: Reduviidae) against three mealybug species of agricultural importance. *Applied Entomology and Zoology* <https://doi.org/10.1007/s13355-018-0576-6>. 2018.
26. Sahayaraj, Kitherian, Subash, Natarajan, Allingham, Robert W., Kumar, Vivek, Avery, Pasco B., Mehra, Lucky K., McKenzie, Cindy L., Osborne, Lance S. Lethal and sub-lethal effects of three microbial biocontrol agents on *Spodoptera litura* and its natural predator *Rhynocoris kumarii*. *Insects* 9(3), 101. 2018. <https://doi.org/10.3390/insects9030101>

27. *Taravati, Siavash, Mannion, Catherine, McKenzie, Cindy and Osborne, Lance.* Oviposition preference of rugose spiraling whitefly (Hemiptera: Aleyrodidae) on five host plant species. *Florida Entomol* 101 (4):611-616. 2018.
<https://doi.org/10.1653/024.101.0423>

Other Publications (40)

28. Chamberlin, J., McKenzie, C., Osborne, L., Schmale, L. A call to action – Or others will force their will upon us! Society of American Florists, Proceedings of the 29th Annual Pest and Production Management Conference XXIX: 71-81. 2013. (Proceedings)
29. *Kumar, V., Kakkar, G., Seal, D.R., McKenzie, C.L., Osborne, L.S.* Vertical and horizontal distribution and seasonal dynamics of an invasive thrips species, *Scirtothrips dorsalis* (Thysanoptera: Thripidae) in south Florida. *Florida Scientist*. 76:7-8. 2013. (Proceedings)
30. *Avery, P.B., McKenzie, C.L., Powell, C.A., Osborne, L.S.* Efficacy of *Isaria fumosorosea* Wize (Hypocreales: Cordycipitaceae) on the leaf phylloplane over time for controlling Madeira mealybug nymphs preshipping. *Florida Scientist*. 76:9-10. 2013. (Proceedings)
31. *Xiao, Y., Osborne, L., McKenzie, C.L., Chen, J.* Influence of diet conditions on predation response of a predatory mite to a polyphagous insect pest. In: Proceedings of the Florida Scientist. 76:16-17. 2013. (Proceedings)
32. Oetting, R., McKenzie C., and Townsend M. Efficacy of insecticide rotations and their impact on populations of the ‘B’ and ‘Q’ biotypes of *Bemisia tabaci*. In: Proceedings of the First International Whitefly Symposium, Kolybari, Crete, Greece T8.P-02: 229. 2013. (Proceedings)
33. *Kumar V., McKenzie, C. L., Mannion, C., Stocks, I., Smith, T. and Osborne, L. S.* *Aleurodicus rugioperculatus* (Rugose spiraling whitefly), online extension publication. Featured Creatures. Entomology and Nematology Department, Florida Department of Plant Industry, Institute of Food and Agricultural Sciences, University of Florida. Available:
http://entnemdept.ufl.edu/Creatures/ORN/Aleurodicus_rugioperculatus.htm. 2013. (Public database)
34. *Kumar, V., Kakkar, G., McKenzie, C.L., Seal, D.R., and Osborne, L.* An overview of chilli thrips, *Scirtothrips dorsalis* (Thysanoptera: Thripidae) Biology, Distribution and Management. Pp. 53-77. In: S. Solenski and M. Larramendy (eds.), Weed and Pest Control – Conventional and New Challenges. Intech. Rijeka, Croatia 205 pp. (Book Chapter). 2013.
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- Aristizabal L. F., P. B. Avery, V. Kumar, J. H. Caldwell, C. L. McKenzie and L. S. Osborne. 2013. Pre-shipment dip treatments using soap, natural oils, and *Isaria fumosorosea*: potential biopesticides for mitigating the spread of whitefly *Bemisia tabaci* (Hemiptera: Aleyrodidae) invasive insects on ornamental plants. 96th Annual Meeting Florida Entomological Society. July 14-17, 2013. Naples, Florida, USA.
- Boughton A., Siavash Taravati, Catharine Mannion and Lance Osborne. 2013. Rugose spiraling whitefly and prospects for biological control by parasitoids. Annual Meeting of Florida Entomological Society. July 14-17, 2013. Naples, Florida, USA.
- Dickey, A.M., Trease, A., Jara, A., Kumar, V., Christenson, M.K., Portluri, P., Morgan, J.K., Shatters, R.G., Jr., Davis, P.H., McKenzie, C.L., Osborne, L.S. 2013. Next-generation DNA sequencing of the globally invasive plant pest, *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae) [abstract]. Florida Entomological Society. Paper No. 41.
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- Kumar V., Osborne L. S., McKenzie, C. L., Arthurs, S., Xiao, Y. F., Miller C., and Chen J. 2013. Predator In First: Introducing a novel biocontrol strategy for managing thrips and other key pests in pepper crops. Palm Beach County Growers Meeting. November 25. Boynton Beach, Florida, USA.
- Kumar, V., Kakkar, G., Seal, D. R., McKenzie C. L., Osborne L.S. 2013. Vertical and horizontal distribution and seasonal dynamics of an invasive thrips species, *Scirtothrips dorsalis* (Thysanoptera: Thripidae) in south Florida. 77th Annual Meeting of the Florida Academy of Sciences. March 8. Barry University, Miami, Florida, USA.
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IPM and Invertebrate Pathology. Remembering Clayton W. McCoy Jr. 1938-2013: A video biography. Annual Meeting of Florida Entomological Society. August 3-6, 2014, Jupiter, FL USA.

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McKenzie, C.L. “President’s Overview of the Florida Entomological Society” at the 12th Annual Arbovirus Surveillance & Mosquito Control Workshop, St. Augustine, FL Mar 24, 2015.

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- Osborne, L.S. 2015. Minimizing Honey Bee Exposure to Pesticides. *In-Service Training* 30947: Minimizing Honey Bee Exposure to Pesticides. Organized by J. Ellis. February 2, 2015. MREC-Apopka, FL.
- Osborne, L.S. 2015. Banker Plants. *In-Service Training* 30969: Implementing Biological control of Ornamental Pests. Organized by Vanessa Campoverde, S. Arthurs, & C. Mannion. Mid-Florida Research & Education Center, Apopka, FL. April 22, 2015.
- Osborne, L.S. 2015. Biological control of whiteflies (Osborne). *In-Service Training*: Collection and Identification of Whiteflies for County Agents. Annual Meeting of Florida Entomological Society. August 2-5, 2015. Fort Myers, FL, USA.
- Osborne, L.S. 2015. Scouting for Insects and Mites. Scout Training Program. Mid-Florida Research & Education Center. Apopka, FL. November 4, 2015.
- Osborne, L.S. 2015. Beginning Biological Control in Protected Agriculture. Mid-Florida Specialty Crops Conference. Mid-Florida Research & Education Center. Apopka, FL. November 6, 2015.
- Osborne, L.S. 2015. Advanced Biological Control in Protected Agriculture. Mid-Florida Specialty Crops Conference. Mid-Florida Research & Education Center. Apopka, FL. November 6, 2015.
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- Bethke J.A., L.S. Osborne, A. Hara, and C.L. Palmer. 2016. Management of arthropods during shipping: A collaboration among entomologists associated with ornamental plant production. International Congress of Entomology. September 25-30. Orlando, Florida, USA.
- Francis, Antonio, Ahmed, Muhammad, *Kumar, Vivek*, Osborne, Lance S., McKenzie, Cindy. 2016. Biological control based strategies to manage privet whitefly (*Aleurotrachelus trachoides*) in Florida. XXV International Congress of Entomology, Orlando, FL Sept 25-30, 2016.
- Kumar, Vivek, Kakkar, Garima*, McKenzie, Cindy L., Seal, Dakshina R., Osborne, Lance, S. 2016. Biology, behavior and management of chilli thrips, and other invasive thrips (Thysanoptera: Thripidae) in south Florida. Hitchhikers in Florida: History and Control Symposium, XXV International Congress of Entomology, Orlando, FL Sept 25-30, 2016.
- Kumar, Vivek*, McKenzie, Cindy. L., Osborne, Lance S. 2016. Susceptibility of ornamental pepper banker plant candidates to common greenhouse pests. Southeastern Branch Meeting of Entomological Society of America, 13-16 March, 2016, Raleigh, NC.
- Ludwig, S.W., C.L. Palmer, J.A. Bethke, J. Chamberlin, D. Gilrein, C.L. McKenzie, R. Oetting, and L. S. Osborne. 2016. Q biotype control in ornamentals — the invasion from Europe to the US. International Congress of Entomology. September 25-30. Orlando, FL, USA.

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- McKenzie C.L. 2016. “Exotic Whitefly in Florida and the use of Banker Plant Systems for their Control” at the Garden Club of Fort Pierce, Heathcote Botanical Gardens, Fort Pierce, FL March 9, 2016.
- McKenzie, C.L. and L.S. Osborne. 2016. Update- *Bemisia*. Dealing with the Q-Biotype-What to Do. *In-Service Training: Whiteflies Affecting Ornamental Plants*. August 10, 2016. MREC-Apopka.
- McKenzie, C. and L.S. Osborne. North American Q-Biotype Invasion Project. Q-Whitefly Webinar hosted by Anita Neal (Southern District Extension Director). August 12, 2016. Indian River-REC, Fort Pierce, FL.
- McKenzie, Cindy, *Dickey Aaron*, M, Stocks, Ian, *Kumar, Vivek*, Osborne, Lance S. “Florida Exotic Whitefly Invaders from the Last Decade”, *Hitchhikers in Florida: History and Control Symposium, XXV International Congress of Entomology*, Orlando, FL Sept 27, 2016.
- Osborne, L.S. 2016. Biological Control in the Landscape. April 5, 2016. Leu Gardens. Orlando, FL.
- Osborne, L.S. 2016. What it is to be an Entomologist. Tour and lecture for local Cub Scout pack. April 16, 2016. MREC-Apopka, FL.
- Osborne, L.S. and C. McKenzie. 2016. An Update on the Detection of *Bemisia tabaci* Biotype-Q in Florida Landscapes. 2016 Annual Meeting of the Florida State Horticultural Society. June 13, 2016. Stuart, FL.
- Osborne, L.S. 2016. Principles of biological control, conservation of natural enemies, compatibility with pesticides, and resistance issues. June 30, 2016. Miami Dade Extension Office, Miami, FL.
- Osborne, L.S. 2016. Imminent Treat or Tempest in a Tea Pot? Assessing implications of the Q biotype in Florida Landscapes. July 29, 2016. Miami Dade Extension Office, Miami, FL.
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- Kumar, Vivek, Kakkar, Garima, Palmer, Cristi, Myers, Wayne, McKenzie, Cindy L., Osborne, Lance S. 2017. Thrips management program for ornamental plants. VII International Symposium on Rose Research and Cultivation, July 2-7, 2017, Angers, France.
- Kumar, Vivek, Kakkar, Garima, Palmer, Cristi, McKenzie, Cindy L., Osborne, Lance S. 2017. Thrips management program for horticultural ornamental crops. Southeastern Branch Entomological Society of America, Memphis, TN, March 12-15, 2017.
- Kumar V., C. L. McKenzie and L. S. Osborne. 2017. Prey stage preference and functional response of *Delphastus catalinae* and *D. pallidus* (Coleoptera: Coccinellidae) on *Bemisia tabaci* (Hemiptera: Aleyrodidae). Annual Meeting of the Entomological Society of America. November 5-8. Denver, Colorado, USA.
- McKenzie, Cindy, Osborne, Lance. 2017. “*Bemisia tabaci* MED (Q biotype) is on the move in Florida to residential landscapes and threatens open field agriculture”, Turf and Ornamental Symposium, Southeastern Branch Entomological Society of America, Memphis, TN, March 15, 2017.
- McKenzie, Cindy, Osborne, Lance, Kumar, Vivek, Oetting, Ron, Palmer, Cristi. 2017. “The Importance of Understanding *Bemisia tabaci* Cryptic Species Identification (i.e. biotypes) and How This Can Impact Insecticide Resistance Management Programs”, P-IE Section Symposium: New Tools and Tactics to Manage Insecticide Resistance. Entomological Society of America, Denver, CO, Nov 5-8, 2017.
- Osborne, L.S., C. McKenzie and V. Kumar. 2017. Q type Whitefly update and management. CEU UPDATE-MREC, Apopka, FL. February 8, 2017.
- Osborne, L.S., C. McKenzie and V. Kumar. 2017. Managing whitefly in nurseries and the landscape. Manatee County Extension, FL. February 16, 2017.
- Osborne, L.S. 2017. Training on Insect Identification for Ocoee High School students participating in the CDE contest. MREC-Apopka, FL April 12, 2017.
- Osborne, L.S., C. McKenzie and V. Kumar. 2017. Managing insects and mites on Citrus grown in greenhouses using Banker Plants. Citrus Update. MREC, Apopka, FL. May 25, 2017.
- Osborne, L.S., C. McKenzie and V. Kumar. 2017. Whitefly Management. Florida First Detector Training. Brevard County FL, May 26, 2017.
- Osborne, L.S., C. McKenzie and V. Kumar. 2017. Q type Whitefly update and management. CEU UPDATE-Lake County Extension. June 1, 2017.
- Osborne L., V. Kumar, G. Kakkar, and C. L. McKenzie. 2017. Thrips management program in ornamental horticulture. 7th Annual Cattleya Symposium. August 3-5, 2017. Fort Pierce, FL, USA.
- Osborne, L.S. and C. McKenzie. 2017. Tour of the South Florida Q-whitefly infested areas.

- WTF-Q task force, Apopka, FL. August 30, 2017.
- Osborne, L.S. and C. McKenzie. 2017. Tour of Mid-Florida Research and Education Center to demonstrate biological control projects in protected culture. Biocontrol East Conference-FL. October 11, 2017.
- Osborne, L.S., C. McKenzie and V. Kumar. 2017. Problems with utilizing commercially available biological control agents in protected culture. Biocontrol East Conference-Orlando, FL. October 12, 2017.
- Osborne, L.S. and Katherine Houben. Scouting for Insect and Beneficials (two separate talks). Scout Training Program. MREC-Apopka, FL, October 19, 2017.

2018

- Kumar, V., McKenzie, C.L., Osborne, L. 2018. Neonic stewardship program for the management of the invasive *Bemisia tabaci* (MED) whitefly. Florida Entomological Society, St. Augustine, FL, July 22-25, 2018.
- McKenzie, Cindy L., Osborne, Lance S. 2018. "Whitefly Identification and Control" in the Interiorscape Technician Workshop for Florida Nursery, Growers and Landscape Association at the Tropical Plant Industry Expo, Fort Lauderdale, FL, Jan 16, 2018
- McKenzie, Cindy L. 2018. "Exotic Whiteflies in South Florida Gardens" at the Jenson Beach Garden Club, Bocchino Center in Langford Park, Jenson Beach, FL, Jan 17, 2018
- McKenzie, Cindy, Kumar, Vivek, Osborne, Lance. 2018. Predator in First: Commercial Bell Pepper Field Production. Southeastern Branch Entomological Society of America, Orlando, FL, March 4, 2018.
- McKenzie, C.L. and L.S. Osborne. 2018. IPM for the non-entomologist-using pesticide to manage the Q-Biotype whitefly. Second of three classes. Palm Beach Garden Club, Palm Beach, FL. March 19, 2018.
- McKenzie, Cindy, Sparks, Alton, Roberts Phillip, Osborne, Lance. 2018. Survey of *Bemisia tabaci* (Hemiptera: Aleyrodidae) in Agricultural Ecosystems in Georgia. Florida Entomological Society, St. Augustine, FL, July 22-25, 2018.
- Osborne L.S. V. Kumar, and C. L. McKenzie. 2018. Pest Management Update – whiteflies, thrips and mites. CEU Day program in ornamental horticulture. Apopka, FL, USA. January 8, 2018.
- Osborne L.S., and C. L. McKenzie. 2018. IPM for the non-entomologist (concentration on managing thrips and whiteflies). First of three classes. Palm Beach Garden Club, Palm Beach, FL. February 5, 2018.
- Osborne L.S. V. Kumar, and C. L. McKenzie. 2018. Update on managing invasive whiteflies, CEU program for Manatee Extension Ornamental Horticulture Program. Palmetto, FL, USA. February 16, 2018.
- Osborne L.S., and C. L. McKenzie. 2018. Lecture and Tour of Mid-Florida Research and Education Center. A talk on our FNRI program to 35 Orange County Public School District Agriscience Teachers. Apopka, FL. March 15, 2018.
- Osborne L.S., and C. L. McKenzie. 2018. IPM for the non-entomologist (concentration on managing thrips and whiteflies). Second of three classes. Palm Beach Garden Club, Palm Beach, FL. March 19, 2018.
- Osborne L.S., and C. L. McKenzie. 2018. IPM for the non-entomologist (concentration on

- managing thrips and whiteflies). Third of three classes. Palm Beach Garden Club, Palm Beach, FL. April 16, 2018.
- Osborne L.S. *V. Kumar*, and C. L. McKenzie. 2018. Update on managing invasive pests and mites, CEU program for Orange County Extension Ornamental Horticulture Program. Orlando, FL, USA. May 8, 2018.
- Osborne L.S. and C. L. McKenzie. 2018. Update on managing invasive pests and mites in ornamental cutting production. Program for Syngenta Cutting production team. Alva, FL, USA. June 14, 2018.
- Osborne L.S. *V. Kumar*, and C. L. McKenzie. 2018. Latest on Q-Biotype Whitefly. Cultivate '18. Columbus, OH, USA. July 14, 2018.
- Osborne L.S. *V. Kumar*, and C. L. McKenzie. 2018. Managing Invasive Whiteflies using the Latest Whitefly Action Plan. Cultivate '18. Columbus, Ohio, USA. July 15, 2018.
- Osborne L.S. and C. L. McKenzie. 2018. Pest Management Update – Mites. CEU Day program in ornamental horticulture. Homestead, Florida, USA. July 24, 2018.
- Osborne L., *V. Kumar*, *G. Kakkar*, and C. L. McKenzie. 2018. Thrips management program in ornamental horticulture. 8th Annual Cattleya Symposium. August 3-5, 2018. Fort Pierce, Florida, USA.
- Osborne L.S. and C. L. McKenzie. 2018. Orange County 4H Volunteer Training-New Invasive Pests Identification and Management. August 14, 2018. Apopka, Florida, USA.

**Evolving and Integration of Management Plans for Major Taxonomic Groups and
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Agreement # 58-6034-8-016**

**Cumulative Publications and Presentations
Start Sept 17 2018 to Sept 16 2023**

FY 19 Presentations (authors, title, meeting, location):

- Colmar, Serra, McKenzie, Cindy L., Osborne, Lance. 2019. Update on cryptic species or biotypes of *Bemisia tabaci* (Gennadius) whitefly complex in the Dominican Republic. 55th Annual Meeting of the Caribbean Food Crops Society, Bávaro, La Altagracia, Dominican Republic, July 8-12, 2019.
- Diepenbrock, Lauren, McKenzie, Cindy L., Osborne, Lance, Ahmed, Muhammad. 2019. *Nipaecoccus viridis* (Newstead), Lebbeck Mealybug, (Coccoidea: Pseudococcidae), a New Pest of Citrus and Ornamentals. Florida Entomological Society, Jupiter, FL July 21-24, 2019.
- McKenzie, Cindy L., Osborne, Lance, Polston, Jane. 2018. Ability of *Aleurotrachelus trachoides* Back to acquire and transmit tomato yellow leaf curl virus. Entomological Society of America, Vancouver, Canada Nov 11-14, 2018.
- McKenzie, Cindy, Colmar, Serra, Osborne, Lance. 2019. First report of *Bemisia tabaci* MED (Q biotype) (Hemiptera: Aleyrodidae) in the Dominican Republic. Florida Entomological Society, Jupiter, FL July 21-24, 2019.
- Osborne L.S. and C. L. McKenzie. 2018. Pest Management 2018. SePro Pest Management Symposium. UF/IFAS-MREC Apopka, FL Oct 17, 2018.
- Osborne L.S. and C. L. McKenzie. 2018. Pest Management 2018. SePro Pest Management Symposium. Homestead, FL Oct 19, 2018.
- Osborne, L.S. 2018. Scouting for Insects & Beneficials. Nursery Scout Training 2018. UF/IFAS-MREC Apopka, FL Nov 1, 2018.
- Osborne, L.S. 2018. Entomology Program at the Mid-Florida Research and Education Center (9 times). Mid-Florida Research and Education Center 50th Anniversary Celebration. UF/IFAS-MREC Apopka, FL Nov 7, 2018.
- Osborne L.S. and C. L. McKenzie. 2019. Pest Management in the Interior Landscape. Interiorscape Tech Workshop. Florida Nursery Grower Landscape Association (FNGLA), Tropical Plant Industry Expo (TPIE) Conference. Fort Lauderdale, FL. Jan 16, 2019.
- Osborne L.S. and C. L. McKenzie. 2019. Managing Chilli Thrips on Roses. South District Meeting of the American Rose Society. Gainesville, FL Jan 19, 2019.
- Osborne L.S. and C. L. McKenzie. 2019. Using Banker Plants for STEM Courses in High School. Seminole County School Administrators. UF/IFAS-MREC Apopka, FL Jan 30, 2019.
- Osborne L.S. and C. L. McKenzie. 2019. Using Banker Plants for STEM Courses in High School. Tour and lecture. A group of California High School Teachers attending a conference at the Land Pavilion in EPCOT. UF/IFAS-MREC Apopka, FL Jan 30, 2019.
- Osborne L.S. and C. L. McKenzie. 2019. Research on Biological Control in Protected Agriculture. Tour and lecture. Valencia College Ag Production course. UF/IFAS-MREC Apopka, FL March 5, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Biological and Chemical Control of Arthropod Pest

- Attacking Vegetables in Greenhouses. Ocoee High School AG Tech Class, Ocoee, FL March 7, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Biological and Chemical Control of Mites. Arthropod Pests. CEU Day at the UF/IFAS-Lee County Extension Office, FL May 3, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Biological Control of Arthropod Pests. CEU Day at the UF/IFAS-Lake County Extension Office, FL May 15, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Use of Biologicals and Banker Plants in Citrus Nurseries. Citrus Nursery Workshop. UF/IFAS MREC-Apopka, FL, June 5, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Programs for Using Banker Plants and Biological Control for Landscape Ornamentals - How Master Gardeners Grow Their Own. Master Gardener Lunch and Learn Meeting at UF/IFAS-Orange County Extension Office, FL June 12, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Biological Control for Landscape Ornamentals. Master Gardener Meeting at UF/IFAS-Sumter County Extension Office, FL June 13, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Arthropod Pest Management for Landscape Ornamentals – Hands on Banker Plants. Tour and Lecture for UF/IFAS-Sumter County Extension Master Gardeners, FL July 9, 2019.
- Osborne L.S. 2019. Introduction to IPM and using Banker Plants to Grow Your Own. 4H Summer program. UF/IFAS-Seminole County Extension Office, FL July 11, 2019.
- Osborne L.S. 2019. Introduction to IPM. TEAM Green tour and Lecture (junior and senior high school students with plans to major in agriculture in college). UF/IFAS-MREC Apopka, FL July 12, 2019.
- Osborne L.S., V. Kumar, and C.L. McKenzie. 2019. Problems with Chili Thrips and Mealybugs? Cultivate'19. AmericanHort Conference. Columbus, OH July 15, 2019.
- Osborne L.S., V. Kumar, and C.L. McKenzie. 2019. Whitefly Update 2019. Cultivate'19. AmericanHort Conference. Columbus, OH July 16, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Arthropod Pest Management in Industrial Hemp- Outlook for the Future. UF/IFAS Industrial Hemp Pilot Project Workshops. Gainesville, FL July 30, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Industrial Hemp Research Update: Adapting IPM for Ornamentals to Industrial Hemp Production in Protected Agriculture. Hemp Industry Open House (repeated 4 times) UF/IFAS-MREC Apopka, FL Aug 16, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Arthropod Pest Management in Industrial Hemp- Outlook for the Future. UF/IFAS Industrial Hemp Pilot Project Workshops. UF/IFAS-MREC Apopka, FL Aug 16, 2019
- Roda, Amy, McKenzie, Cindy L., Rohrig Eric, Osborne, Lance, Ahmed, Muhammad Z. 2019. Developing Strategies to Manage a New Invasive Pest Species, the Phantasma Scale (*Fiorinia phantasma* Hemiptera: Diaspididae). Florida Entomological Society, Jupiter, FL July 21-24, 2019.

FY19 Publications (proceedings, journal, magazine that are in press or published):

- Ahmed, M.Z., Diepenbrock, L.M., Hodges, G., Whilby, L. Miller, D., Burrow, J.D, McKenzie, C., Osborne, L. 2019. Field guide of lebbeck mealybug. FDACS—P-02117, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Florida. December 2019, 8 pp.
- Avery, Pasco B., Kumar, Vivek, Skvarch, Edward A., Mannion, Catharine M., Powell, Charles

- A., McKenzie, Cindy L., Osborne, Lance S. An ecological assessment of *Isaria fumosorosea* compared to a neonicotinoid treatment for regulating invasive ficus whitefly. *Journal of Fungi* 5, 36. 2019. <http://dx.doi.org/10.3390/jof5020036>
- Kumar, V., McKenzie, Cindy L., Osborne, Lance S. Control of *Bemisia tabaci* (MED) on salvia, 2018. *Arthropod Management Tests*. 43(1): G tsy107, 2 pp. 2018. (Report).
- Kumar, Vivek, Kakkar, Garima, Palmer, Cristi, Myers, Wayne, McKenzie, Cindy, L., Osborne, Lance, S. Chilli thrips, *Scirtothrips dorsalis* – small player with big damage. *Acta Horticulturae* 1232:247-251. 2019. <https://doi.org/10.17660/ActaHortic.2019.1232.36>
- McKenzie, Cindy L., Osborne Lance. 2018. 2018 Whitefly Control Update. American Floral Endowment (AFE) December 2018 Newsletter.
- Taravati, Siavash, Mannion, Catherine, Osborne, Lance and McKenzie, Cindy. Lethal and sublethal effects of selected systemic and contact insecticides on the whitefly predator, *Nephaspis oculata* (Coleoptera: Coccinellidae), in a tri-trophic system. *Journal of Economic Entomology* 112(2): 543-548. 2019. <https://doi.org/10.1093/jee/toy364>

FY 20 Presentations (authors, title, meeting, location):

- Kumar, V., Dickey, Aaron, Seal, Dakshina, Shatters, Robert Jr., Osborne, Lance, McKenzie, Cindy, Osborne, L. 2018. Unexpected high intragenomic variation in two of three major pest thrips species does not affect ribosomal internal transcribed spacer 2 (ITS2) utility for thrips identification. Entomological Society of America, St. Louis, MO Nov 17-20, 2019.
- McKenzie, Cindy L., Osborne, Lance, Polston, Jane. 2019. Can *Aleurotrachelus trachoides* Back Acquire and Transmit Tomato Yellow Leaf Curl Virus? Entomological Society of America, St. Louis, MO Nov 17-20, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Industrial Hemp Research Update: Adapting IPM for Ornamentals to Industrial Hemp Production in Protected Agriculture. Open House for Florida Nursery Grower Landscape Association and Local Growers Hemp Industry, UF/IFAS-MREC, Apopka, FL October 1, 2019.
- Osborne L.S. and C. L. McKenzie. 2019. Research on the Management of Invasive Species. Tour and lectures. Valencia College Survey of Pest Control course. UF/IFAS-MREC Apopka, FL Oct 3, 2019.
- Osborne L.S. and C. L. McKenzie. 2019. Biological Control using banker plants. Wellington Garden Club, Wellington, FL Oct 7, 2019
- Osborne L.S. and C.L. McKenzie. 2019. Managing Pests in the Garden. Wellington Garden Club. UF/IFAS-Wellington, FL Oct. 7, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Development and Use of Insect Fungal Pathogens on Pests of Ornamentals. Biopesticides North America Summit. Orlando, FL. October 9-10, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Managing Pests in Roses. Greater Palm Beach Rose Society. West Palm Beach, FL. Oct. 28, 2019.
- Osborne L.S. 2019. Pests of Hemp. UF-IFAS Hemp working group. Gainesville, FL. November 5, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Annual Scout Training Program. UF/IFAS-MREC Apopka, FL Nov. 7, 2019.
- Osborne L.S. and C.L. McKenzie. 2019. Biological Control of Pests. Plant Health On the Go! UF/IFAS-MREC Apopka, FL Dec. 3, 2019.

Osborne L.S. and C.L. McKenzie. 2019. Banker Plants. University of Maryland Extension and Maryland Nursery, Landscape and Greenhouse Association Biological Control Conference. Baltimore, MD. Dec.17, 2019.

FY20 Publications (proceedings, journal, magazine that are in press or published):

Avery, Pasco B., Kumar, Vivek, Francis, Antonio, McKenzie, Cindy L., Osborne, Lance S. Compatibility of *Delphastus catalinae* and *Cordyceps fumosorosea* for mitigating invasive whitefly, *Aleurothrixus trachoides* in Florida. BioControl (submitted 5/1/2020);

Colmar, Serra, McKenzie, Cindy L., Luo, Weiqi, Osborne, Lance S. First report of *Bemisia tabaci* Mediterranean (biotype Q) (Hemiptera: Aleyrodidae) in the Dominican Republic. Florida Entomol 102(4): 778-782. 2019. <https://doi.org/10.1653/024.102.0417>

Kumar, Vivek, Mehra, Lucky, McKenzie, Cindy L., Osborne, Lance S. Functional response and prey stage preference of *Delphastus catalinae* Horn and *D. pallidus* LeConte (Coleoptera: Coccinellidae) on *Bemisia tabaci* (Hemiptera: Aleyrodidae). Biocontrol Science and Technology. 2020. <https://doi.org/10.1080/09583157.2020.1749833>

McKenzie, Cindy L., Sparks, Jr., Alton N., Roberts, Phillip, Oetting, Ronald, Osborne, Lance S. Survey of *Bemisia tabaci* (Hemiptera: Aleyrodidae) in agricultural ecosystems in Georgia. J Entomol Science 55(2): 163-170. 2020. <https://doi.org/10.18474/0749-8004-55.2.163>

Schoeller, Erich N., McKenzie, Cindy L., Osborne, Lance S. Comparison of the Phytoseiid Mites *Amblyseius swirskii* (Athias-Henriot) and *Amblydromalus limonicus* (Garman and McGregor) for Biological Control of Chilli Thrips *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae). Experimental and Applied Acarology (submitted 3/12/2020);

Schoeller, Erich N., McKenzie, Cindy L., Osborne, Lance S. Control of Chilli Thrips *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae) on Roses Using an Ornamental Pepper Banker Plant System. Biological Control. (submitted