

Eric H. Clifton, *Curriculum Vitae*

Iowa State University
Department of Entomology
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Education

Iowa State University

Ph.D. Entomology

Projected Graduation: Spring 2017

Cumulative GPA: 3.37

Iowa State University

M.S. Entomology

Graduated: Summer 2013

Cumulative GPA: 3.37

Augustana College

B.S. Biology

Graduated: May 2010

Cumulative GPA: 3.42

Research and Professional Experience

Ph.D. Graduate Research Assistantship, Iowa State University (July 2013 - present)

Studying pest and pesticide interactions as a means to optimize soybean yield, with a focus on host plant resistance, seasonal densities of soybean cyst nematode and soybean aphid, seed treatments and foliar insecticides. Other studies include induced systemic resistance via entomopathogenic fungi and identification of entomopathogenic fungi with PCR.

Advised by Drs. Erin W. Hodgson and Aaron J. Gassmann

M.S. Graduate Research Assistantship, Iowa State University (Jan 2011 - July 2013)

Thesis title: Impacts of conventional and organic agriculture on soil-borne entomopathogenic fungi
Studied entomopathogenic fungi within organic and conventionally managed cropping systems and measured effects of herbicides and fungicides on entomopathogenic fungi.

Advised by Drs. Aaron J. Gassmann and Erin W. Hodgson

Intern, Bureau of Land Management, Needles Field Office, CA (June 2010 to Nov 2010)

Collected wild plant seeds for the Seeds of Success program, conducted spring surveys, monitored populations of native bat species and updated the database on natural water sources in San Bernardino County.

Laboratory proctor, BIOL-335 Entomology, Augustana College, Rock Island, IL (Aug 2009 to Dec 2009)

Assisted the class instructor with laboratory setup, transported students for field collections, and tutored students.

Publications

Gassmann, A.J. and **Clifton, E.H.** Current and potential applications of biopesticides to manage insect pests of maize. In Lacey, L.A. (Ed.), *Microbial Control of Insect and Mite Pests: From Theory to Practice*. 1st edition. Elsevier, London (in press).

Clifton, E.H., Tylka, G.L., Gassmann, A.J., Hodgson, E.W. Effects of host plant resistance and seed treatments on *Aphis glycines*, *Heterodera glycines*, and soybean yield (in preparation).

Gassmann, A.J., Shrestha, R.B., Jakka, S.R.K., Dunbar, M.W., **Clifton, E.H.**, Paolino, A.R., Ingber, D.A., French, B.W., Masloski, K.E., Doudna, J.W., St. Clair, C.R. 2016. Evidence of resistance to Cry34/35Ab1 corn by western corn rootworm (Coleoptera: Chrysomelidae): root injury in the field and larval survival in plant-based bioassays. *Journal of Economic Entomology* (in press).

Clifton, E.H., Jaronski, S.T., Hodgson, E.W. and Gassmann, A.J. 2015. Abundance of soil-borne entomopathogenic fungi in organic and conventional fields in the Midwestern USA with an emphasis on the effect of herbicides and fungicides on fungal persistence. PLoS ONE: 10(7): e0133613.

Gassmann, A.J., Petzold-Maxwell, J.L., **Clifton, E.H.**, Dunbar, M.W., Hoffmann, A.H., Ingber, D.A., and Keweshan, R.S. 2014. Field-evolved resistance by western corn rootworm to multiple *Bacillus thuringiensis* toxins in transgenic maize. Proceedings of the National Academy of Sciences: 111(14), 5141-5146.

Petzold-Maxwell, J.L., Jaronski, S.T., **Clifton, E.H.**, Dunbar, M.W., Jackson, M.A., and Gassmann, A.J. 2013. Interactions among Bt maize, entomopathogens, and rootworm species (Coleoptera: Chrysomelidae) in the field: effects on survival, yield, and root injury. Journal of Economic Entomology: 106(2), 622-632.

Submitted Paper Presentations

September 2016: 25th International Congress of Entomology – Orlando, FL. Submitted Papers: Biological Control and Insect Pathology: Entomopathogens and Weed Biocontrol. Can entomopathogenic fungi induce plant defenses to suppress soybean aphid? **Clifton, E.H.**, Gassmann, A.J., and E.W. Hodgson.

July 2016: 49th Annual Meeting of the Society for Invertebrate Pathology – Tours, France. Contributed Papers; Fungi 1 session. Impacts of conventional and organic agriculture on soil-borne entomopathogenic fungi. **Clifton, E.H.**, E.W. Hodgson, S.T. Jaronski, and A.J. Gassmann.

November 2015: 63rd Annual Meeting of the Entomological Society of America – Minneapolis, MN. Submitted Papers; Session II: Plant-Insect Ecosystems: Integrated Pest Management B. Managing two soybean pests to optimize yield. **Clifton, E.H.**, E.W. Hodgson, G.L. Tylka, and A.J. Gassmann.

November 2014: 62nd Annual Meeting of the Entomological Society of America – Portland, OR. Submitted Papers: Session XXIV: Plant-Insect Ecosystems. Determining pest and pesticide interactions as a means to optimize soybean yield. **Clifton, E.H.**, E.W. Hodgson, G.L. Tylka, and A.J. Gassmann.

March 2014: 69th Annual Meeting of the Entomological Society of America – North Central Branch, Des Moines, IA. Submitted Papers; Session I: Plant-Insect Ecosystems. Determining pest and pesticide interactions as a means to optimize soybean yield. **Clifton, E.H.**, E.W. Hodgson, G.L. Tylka, and A.J. Gassmann.

June 2013: 68th Annual Meeting of the Entomological Society of America – North Central Branch, Rapid City, SD. Submitted Papers; Session II: Plant-Insect Ecosystems; Systematics, Evolution, and Biodiversity. Impacts of conventional and organic agriculture on soil-borne entomopathogenic fungi. **Clifton, E.H.**, E.W. Hodgson, S.T. Jaronski, and A.J. Gassmann.

November 2012: 60th Annual Meeting of the Entomological Society of America, Knoxville, TN. Student Competition for the President's Prize; Plant-Insect Ecosystems, Section 4 Presentation. Impacts of organic and conventional agriculture on entomopathogenic fungi. **Clifton, E.H.**, E.W. Hodgson, S.T. Jaronski, and A.J. Gassmann.

Placed 2nd in the President's Prize Competition, PIE-Section 4

June 2012: 67th Annual Meeting of the Entomological Society of America – North Central Branch, Lincoln, NE. Student Competition for the President’s Prize; B.S./M.S. Section Presentation. Impacts of organic and conventional agriculture on entomopathogenic fungi. **Clifton, E.H.**, E.W. Hodgson, S.T. Jaronski, and A.J. Gassmann.

Placed 2nd in the President’s Prize Competition, B.S./M.S. Section

Submitted Poster Presentations

June 2015: 70th Annual Meeting of the Entomological Society of America – North Central Branch, Manhattan, KS. Student Competition for the President’s Prize; Ph.D. - Medical, Urban, and Veterinary Entomology/Plant & Insect Ecosystems Section. Managing two soybean pests to optimize yield. **Clifton, E.H.**, E.W. Hodgson, G.L. Tylka, and A.J. Gassmann.

Placed 1st place in the President’s Prize Competition, Ph.D. MUVE/PIE Section

November 2013: 61st Annual Meeting of the Entomological Society of America, Austin, TX. Student Competition for the President’s Prize; Plant & Insect Ecosystems, Section 1 Poster. Determining pest and pesticide interactions as a means to optimize soybean yield. **Clifton, E.H.**, E.W. Hodgson, G.L. Tylka, and A.J. Gassmann.

April 2012: 10th Anniversary of Iowa State University Graduate Program in Sustainable Agriculture. Ames, IA. Poster: Comparison of entomopathogenic fungi in organic and conventional farms. **Clifton, E.H.**, E.W. Hodgson, S.T. Jaronski, and A.J. Gassmann.

**Awarded with honorable mention*

November 2011: 59th Annual Meeting of the Entomological Society of America, Reno, NV. Student Competition for the President’s Prize; Plant & Insect Ecosystems, Section 3 Poster. Effects of organic and conventional agriculture on entomopathogenic fungi. **Clifton, E.H.**, E.W. Hodgson, S.T. Jaronski, and A.J. Gassmann.

Placed 1st place in the President’s Prize Competition, PIE-Section 3

March 2011: 66th Annual Meeting of the Entomological Society of America – North Central Branch, Minneapolis, MN. Poster: Comparison of entomopathogenic fungi in organic and conventional farms. **Clifton, E.H.**, E.W. Hodgson, S.T. Jaronski, and A.J. Gassmann.

Presentations at Professional Meetings and Symposia (presenting author is underlined)

Gassmann, A.J., **Clifton, E.H.**, Doudna, J., Dunbar, M.W., Hoffmann, A., Ingber, D.A., Jakka, S.R.K., Keweshan, R.S., Masloski, K.E., Paolino, A., Petzold-Maxwell, J.L., Shrestha, R. and St. Clair, C. 2016. Field-evolved resistance to Bt maize by western corn rootworm. XXV International Congress of Entomology. Orlando, Florida, USA.

Hodgson, E. W., Vannostrand, G. and **Clifton, E. H.** Using host plant resistance for soybean aphid and soybean cyst nematode to protect soybean yield. 71st Annual North Central Branch Entomological Society of America Meeting, Cleveland, OH, 8 June 2016.

Gassmann, A.J., **Clifton, E.H.**, Doudna, J., Dunbar, M.W., Hoffmann, A.M., Ingber, D.A., Jakka, S., Keweshan, R.S., Masloski, K.E., Paolino, A., Petzold-Maxwell, J.L., Shrestha, R.B., and St. Clair, C. 2015. Resistance and cross-resistance to Bt maize by populations of western corn rootworm from Iowa. Entomological Society of America. Minneapolis, Minnesota.

Gassmann, A.J., Clifton, E.H., Dunbar, M.W., Hoffmann, A.M., Ingber, D.A., Jakka, S., Petzold-Maxwell, J.L., Rudeen, M., and Shrestha, R.B. 2014. Bt resistance in western corn rootworm: a model for understanding pest management with Bt crops that are not high dose. North Central Branch Meeting, Entomological Society of America. Des Moines, Iowa, USA.

Maxwell, J., Jaronski, S.T., Clifton, E.H., Dunbar, M.W., Jackson, M.A. and Gassmann, A.J. 2014. Interactions among Bt maize, entomopathogens and the western corn rootworm. International Working Group on Ostrinia and other Maize Pests. Chicago. Illinois.

Gassmann, A. J., Clifton, E. H., Dunbar, M. W., Hoffmann, A. M., Ingber, D. A., Jakka, S., Petzold-Maxwell, J. L., Rudeen, M., and Shrestha, R. B. 2014. Bt resistance in western corn rootworm: a model for understanding pest management with Bt crops that are not high dose. International Working Group on Ostrinia and other Maize Pests. Chicago. Illinois.

Gassmann, A.J., Petzold-Maxwell, J.L., Clifton, E.H., Dunbar, M.W., Hoffmann, A.M. and Ingber, D.A. 2013. Resistance of western corn rootworm to Bt corn: data from the laboratory and field. Entomological Society of America. Austin, Texas, USA.

Gassmann, A.J., Petzold-Maxwell, J.L., Clifton, E.H., Dunbar, M.W., Hoffmann, A.M. Ingber, D.A. and Keweshan, R.S. 2012. Western corn rootworm and Bt maize: a case study illustrating the need for IPM and IRM. Entomological Society of America. Knoxville, Tennessee, USA.

Gassmann, A.J., Petzold-Maxwell, J.L., Rudeen, M.L., and Clifton, E.H. 2012. Transgenic maize and entomopathogens: multiple mode of action pest control. 7th International Integrated Pest Management Symposium. Memphis, Tennessee, USA.

Gassmann, A.J., Petzold-Maxwell, J.L., Clifton, E.H., Dunbar, M.W., Hoffmann, A.H., Ingber, D.A., and Keweshan, R.S. 2012. Resistance of western corn rootworm to Bt maize. Society for Invertebrate Pathology. Buenos Aires, Argentina.

Petzold-Maxwell, J.L., Dunbar, M.W., Clifton, E.H., Jaronski, S.T., Jackson, M.A. and Gassmann, A.J. 2012. Interactions among Bt maize, entomopathogens and rootworm species in the field: effects on survival, yield and root injury. North Central Branch Meeting, Entomological Society of America. Lincoln, Nebraska.

Outreach Presentations and Publications

Hodgson, E.W., **Clifton, E.H.**, Tylka, G.L., and Gassmann, A.J. 2016. Managing two soybean pests to optimize yield. Integrated Crops Management News. Iowa State University.

Clifton, E.H., E.W. Hodgson, G.L. Tylka, and A.J. Gassmann. 2015. Managing two soybean pests to optimize yield. Crops Team Fall In-Service. Boone, IA.

Clifton, E.H., Hodgson, E.W., and Gassmann, A.J. 2011. Entomopathogenic fungi and nematodes in agriculture. Practical Farmers of Iowa Field Day. Boone, IA.

Clifton, E.H., Hodgson, E.W., and Gassmann, A.J. 2011. Entomopathogenic fungi and nematodes in agriculture. Practical Farmers of Iowa Field Day. Farm of Paul Mugge. Sutherland, IA

Teaching Experience

Spring 2014, 2015, 2016: Laboratory teaching assistant. ENT 376 – Fundamentals of Entomology and Pest Management. Iowa State University. Professors: A.J. Gassmann and M.E. O’Neal.

Grants and Scholarships

Larry Pedigo Graduate Scholarship in Entomology, Iowa State University Entomology Department. 2015. \$2,000

Jim Oleson Scholarship in Entomology, Iowa State University Entomology Department. 2015. \$2,000

Entomology Alumni Scholarship, Iowa State University Entomology Department. 2014. \$1,500.

Henry and Sylvia Richardson Research Incentive Grant, Iowa State University Entomology Department. 2013. "Can entomopathogenic fungi serve as plant bodyguards?" \$2,000.

Professional Societies and Services

Member, ISU Entomology Graduate Student OrganizationJanuary 2011 to present

 President Aug. 2013 – Aug. 2015

 Secretary Jan. 2011 - Aug. 2013

Iowa State University Master Gardener's ProgramFall 2013 to present

Member, Entomological Society of AmericaJanuary 2011 to present