

**NORTH CENTRAL BRANCH**  
**Entomological Society of America**

**55<sup>th</sup> Annual Meeting**

**March 26-29, 2000**

**President Dave Horn**

**Radisson Hotel Metrodome**  
**615 Washington Ave., S.E.**  
**Minneapolis, MN 55414**

# Contents

Welcome to Minnesota! .....	1
1999-2000 Officers & Committees North Central Branch, ESA .....	6
2000 North Central Branch Award Recipients ....	11
Program .....	15
Sunday, March 26, 2000 .....	15
Evening .....	16
Monday, March 27, 2000 .....	18
Morning .....	18
Afternoon .....	27
Evening .....	36
Tuesday, March 28, 2000 .....	37
Morning .....	37
Afternoon .....	50
Evening .....	61
Wednesday, March 29, 2000 .....	62
Morning .....	62
Presenter Index .....	70
Taxonomic Index .....	74
Key Word Index .....	79
Blank Schedules .....	87

# WELCOME TO MINNESOTA!

On behalf of the University of Minnesota Department of Entomology, it is our pleasure to welcome you to the 55<sup>th</sup> Annual North Central Branch Meeting of the Entomological Society of America in the “Twin Cities” of St. Paul and Minneapolis, Minnesota. This meeting reflects a tremendous diversity of research, teaching, extension and industry activity currently underway in the North Central U.S., including a significant amount of interdisciplinary investigation and outreach. We trust that this meeting will be a productive venue for you to connect with your colleagues and gain new insights into your field of work.

As we prepare to enter the next century, our theme for 2000 is “Branching Out”. The second annual President’s symposium is focusing on dissemination of entomological information from professionals involved in education in K-12 schools to zoos and conservatories. The “ESA Heritage Symposium,” Sunday evening will remind us of some of the diversity and personalities that shaped our history within ESA, and specifically the North Central Branch.

The Local Arrangements and Program Committees for the 2000 Annual Meeting express our sincere appreciation to all of our members and guest speakers who have committed their time to organizer symposia, submit excellent presentations and participate in this meeting. We wish you all a productive time in the Twin Cities!

## **The Twin Cities of St. Paul and Minneapolis**

The vibrant Minneapolis-St. Paul area is the entertainment and cultural center of the upper Midwest. The scenery of this attractive metropolis includes contemporary skylines, historic architecture, and greenways of parks, lakes and the Mississippi and Minnesota rivers.

The Twin Cities is noted for its array of intriguing theater, fine orchestras, art museums and a sculpture garden. There’s always a full calendar of visiting performers and Broadway touring shows, as well.

---

Interesting museums, professional sports, riverboats and a variety of nightspots add to the appeal of the Twin Cities. Along the Mississippi riverfront in Minneapolis are historic mills, the 1883 Stone Arch Bridge, and scenic walkways. Downtown St. Paul is home to a creative children's museum, top-notch science museum and landmark history center. Other nearby attractions include the Bell Museum of Natural History (on the University campus), the Minneapolis Institute of Arts (currently hosting the Star Wars exhibit), the Sculpture Gardens (in downtown Minneapolis), the Weisman Art Museum (on the University Campus) and Como Park and Zoo (close to the St. Paul Campus).

With the Mall of America in Bloomington, the Twin Cities has become an international shopping destination. The Mall is the largest shopping and entertainment complex in the U.S. The Nicollet Mall in downtown Minneapolis is another favorite with shoppers, with an eclectic mix of shops and galleries. Dining is another Twin Cities highlight. There's a vast assortment of restaurants, with an especially interesting array of ethnic restaurants. We hope you enjoy your stay in the Twin Cities.

## Registration

Registration badges are required for admission to all functions. The registration desk on the Second Floor Lobby and will be open for check-in for those who pre-registered and for on-site registration during the following times:

Sunday	1:00-7:00 PM
Monday	8:00 AM – 5:00 PM
Tuesday	8:00 AM– 5:00 PM
Wednesday	8:00-Noon

## Correction regarding Federal ID number

If you pre-registered and your company requires a federal ID number to be filed for reimbursement, **the correct Federal ID number for ESA registration is 52-0622480**. Some of the early registration forms had an incorrect Federal ID number.

## **Messages, Program Changes, Lost and Found**

A message board and tacks will be available in the registration area for posting announcements. Changes in the scheduled program and other meeting news will also be posted here. Notices concerning changes in the scheduled program should be submitted to the meeting registration desk. Lost and found articles may be turned in and retrieved at the registration desk.

## **For Spouses and Guests**

The Campus room has been set aside as a gathering place for guests throughout the conference (beginning 1:00 Sunday). Millie Ascerno and Betty Radcliffe will meet you in the Campus room from 8:00 to 9:30 a.m. Monday and Tuesday mornings to assist you with your sightseeing or shopping plans. You may also leave a message on the bulletin board in that room at any time (through Tuesday evening) and we'll connect with you. You'll find dozens of interesting possibilities in your guest welcome packet. Guests are also welcome at the continental breakfasts Monday, Tuesday and Wednesday.

With the conference hotel situated on the University of Minnesota campus, packet materials call special attention to attractions within walking distance. We've arranged for a free guided tour on Tuesday morning, at 9:45 a.m., of the Humphrey Forum at the Hubert H. Humphrey Institute of Public Affairs, located across the Mississippi River on the West Bank Campus. The Forum is an interactive museum featuring artifacts from Humphrey's public life and exploring the issues he promoted as Minnesota's Senator and then the nation's Vice President. You'll have time to also view other spectacular buildings on this campus or to stroll through the Nash Gallery (art exhibitions by University faculty, students and area artists), and still be back to the hotel in time for the Awards Luncheon. Transportation will be provided.

## **Public Meeting Room**

The Northrup and Campus Rooms are available for informal meetings, such as committee work or discussions with the press. Contact the registration desk regarding availability and a sign-up sheet for reserving the room.

## **Employment Opportunity Center**

The Employment Opportunity Center is located in the Collegiate Room. Employers are invited to advertise available positions and job seekers are encouraged to distribute their vitae in the folders provided in the room. Check the daily program schedule for times when the room is open.

## **Audio-Visual Equipment**

Rooms are equipped with 35-mm slide projectors designed to use standard 80-slide carousels. Each speaker must provide slides in a carousel, marked with his/her own name and paper #, to the projectionist at least 10 minutes before the beginning of the session. Extra slide carousels will not be available in the meeting rooms.

Video projectors and laptop computers (Windows only) for PowerPoint presentations that use the Microsoft Office 97 program are available in all rooms. We will strictly adhere to the program schedule so we are requesting that your presentation file be submitted electronically to the local Arrangements Committee prior to the meeting. Because of compatibility issues, we are discouraging “hot-synch” swapping of laptops during the paper sessions. If you did not upload your file via our FTP site, we will have a computer available in the Audio Visual Room (Rotary) between 5:30 and 6:30 pm each day, where you can upload your presentation for transfer to the appropriate laptop by the following morning. Your presentation must be on removable media (Zip, LS-120, or 3.5” floppy disks). We cannot directly cable two laptops for file transfer using software such as Lap Link, because of software security and compatibility issues.

## **Poster Presentations**

Poster presentations are scheduled for the Humphrey room on Monday, 8:00 AM - 5:00 PM (set up on Sunday, 4:00-8:00 PM); and Tuesday, 8:00-5:00 PM (set up on Monday, 6:00-9:00 PM). Authors are requested to be at their poster(s) to answer questions between 4:00-5:00 PM for the Monday session or 1:00 - 2:00 PM for the Tuesday Session. Posters should be removed between 5:00-6:00 PM on the day of the presentation.

## **Guidelines for Speakers and Moderators**

Speakers and moderators will follow standard practices for ESA meetings. Moderators are responsible for maintaining the printed schedule, by not starting any presentation before the scheduled time and by not allowing any speaker to exceed the allotted time for his/her presentation. Speakers that exceed their allotted presentation time will be requested by the moderator to conclude their presentation immediately. Please be considerate of others. Moderators in each room should obtain a pointer and timer from the Audio-Visual Room (Rotary) prior to their session. Pointers and timers should be returned to the Audio-Visual Room immediately after the session concludes. The ESA guidelines state that no smoking is allowed in any meeting room. For additional information, contact Rob Venette.

# **1999-2000 Officers & Committees North Central Branch, ESA**

## **President**

Dave Horn

## **President-Elect**

Dave Hogg

## **Past President**

Ted Radcliffe

## **Secretary-Treasurer**

Linda Mason

## **Governing Board Representative**

Larry Larson

## **Executive Committee Members-at-Large**

Mike Culy

Randy Higgins

Marlin Rice

## **Program Committee**

David Ragsdale and Roger Moon, co-Chairs

## **Local Arrangements Committee**

Ted Radcliffe, Chair

## **Registration**

Mark Ascerno

## **Audio-Visual**

Rob Venette



## **Vendor Displays**

Tom Green

## **Web Site Committee (ad-hoc)**

John VanDyk, Chair

Ian MacRae

John Lloyd

Dave Ragsdale

## **Nominating Committee**

Fred Baxendale, Chair

Barbara Nead-Nylander

Dan Potter

## **Auditing Committee**

Roger Ratcliffe, Chair

Kevin Steffey

Donald Lewis

## **Resolutions Committee**

Eli Levine, Chair

Ronald Hammond

Denise Olsen

## **Location and Time Committee**

James Nechols, Chair

Whitney Cranshaw

Mark Hertlein

## **Student Awards Committee**

Rick Weinzierl, Chair

Vera Krischik

Chris DiFonzo

Ian MacRae

Billy Fuller

Jon Bedick

## **NCB Award of Merit Committee**

Robert Barney, Chair

Frank Hall

Tom Turpin

Shripat Kamble

Mike Smith

John Sedlacek

## **C.V. Riley Award Committee**

Larry Pedigo, Chair

Jay McPherson

David Denlinger

Douglas Dahlman

Mike Chippendale

Leon Higley

## **National ESA Awards Committee**

Robert Wright, Chair

May Berenbaum

Paula Davis

Richard Merritt

Dan Mahr

David Onstad

## **Public Information/Public Relations Committee**

Jeff Hahn, Chair

Roger Moon

Whitney Cranshaw

## **Membership Committee**

Ken Ostlie, Chair

Lynne Rieske-Kinney

Larry Charlet

Wayne Bailey

Rick Hellmich

Joe Reed

## **Photo Salon Committee**

Tom Myers, Chair

Jim Mertins

Frank Peairs

Phil Sloderbeck

David Voegtlin

Monte Johnson

Jerry DeWitt

## **Linnaean Games Committee**

Marlin Rice, Chair & Gamesmaster

Barbara Nead-Nylander

Mike Gray

Jeremey Heath

David Margolies

Tom Turpin

J. R. Stewart

## **Student Affairs Committee**

Jason Harmon, Chair

Rayda Krell, Vice-Chair

Brian Kopper, Assistant Chair

## **Strategic Planning Committee (Council of Elders, ad hoc)**

Larry Larson, Chair

Dave Horn

Kevin Steffey

Mark Zajac

Tom Turpin

Dave Hogg

## **Archivist (ad hoc)**

Ken Holscher

## **Special Program Sponsors**

Aventis CropScience  
Bayer Corp.  
Dow AgroSciences  
Elf Atochem North America, Inc.  
FMC Corp.  
Novartis Crop Protection  
Trécé Inc.

## **Commercial and Non-Profit Vendors**

Academic Press  
Elf Atochem North America, Inc.  
Hearts and Flowers Butterfly Farm  
Monsanto Co.  
Novartis  
Trece, Inc.  
Kansas State Entomology Club,  
Kansas State University  
University of Minnesota Graduate Students (Frenatae),  
University of Minnesota  
Entomology Graduate Students,  
University of Nebraska-Lincoln

## **Entomology Department Sponsors**

Iowa State University  
University of Illinois  
Kansas State University  
University of Kentucky  
Michigan State University  
University of Minnesota  
University of Missouri  
University of Nebraska  
North Dakota State University  
Ohio State University  
University of Wisconsin

## **Other Academic Sponsors**

Illinois Natural History Survey, University of Illinois

## **2000 NORTH CENTRAL BRANCH AWARD RECIPIENTS**

### **NCB Award of Merit To Be Announced**

#### **C. V. Riley Achievement Award**

Lowell R. "Skip" Nault  
The Ohio State University

Dr. Lowell R. "Skip" Nault is currently Professor Entomology at the Ohio State University and Associate Director of the Ohio Agricultural and Research Development Center (OARDC). He received his Ph.D. from Cornell in 1966 and joined the faculty at Ohio State immediately thereafter. In addition to his administrative duties, Nault has guided 16 graduate students through their degree programs, taught popular courses in introductory entomology and vector biology, and directs an impressive research program on insect transmission of plant viruses.

His discoveries have unraveled the complex interactions between the insect vectors and the diseases they transmit. His studies have not only resulted in practical applications, yielding millions of dollars in savings for grain producers, but have also traced the fascinating evolutionary history of vectors as they moved from the ancestors of maize to the modern maize plant.

In addition to his dedicated service to the department and university, Skip has served as President of the Entomological Society of America (1990-91), organizer of the *Handbook of Insect Pests* series, and has served the society on numerous committees. He has also served as Associate Editor of the journal *Phytopathology*. And, twice he served as Program Manager for the USDA Competitive Grants Program.

Skip's contributions have been recognized by his being elected as a Fellow of the ESA, AAAS, and the America Phytopathological Society. He was also the first recipient of the OARDC's Senior Distinguished Scientist Award.

## **National ESA Awards**

**ESA Award For Excellence in  
Integrated Pest Management  
(sponsored by Novartis Crop Protection)  
To Be Announced**

**ESA Distinguished Achievement  
Award in Extension  
To Be Announced**

**ESA Distinguished Achievement  
Award in Teaching  
To Be Announced**

### **J. H. Comstock Graduate Student Award**

Eileen Eliason  
University of Kentucky

Eileen Eliason of the University of Kentucky is the winner of the 2000 J.H. Comstock Award for the North Central Branch. Dr. Eliason defended her Ph.D. dissertation, entitled “Ecology, Host-Plant Relationships, and Management of the Horned Oak Gall Wasp, *Callirhytis cornigera* (Hymenoptera: Cynipidae),” in November, 1999 under the direction of Daniel Potter. During her M.S. and Ph.D. studies she maintained a near-perfect grade point average, served as president of the UK Entomology Club, was elected to the UK Graduate Council, and served on the ESA Student Affairs Committee. She has been active in outreach programs involving landscape professionals, and she has led and participated in more general entomology programs for youth and adults in Lexington and elsewhere. Dr. Eliason has 7 research publications in print or in various stages of review in refereed journals; in addition she has authored several extension fact sheets and trade journal articles.

# **NCB Graduate Scholarship Award**

David Schulz  
University of Illinois

David Schulz of the University of Illinois is the 2000 North Central Branch Graduate Scholarship Award winner. Under the direction of Gene Robinson, David is in the midst of Ph.D. studies on the influence of biogenic amines on the division of labor in honey bees, a project that has required a mix of chemical detection techniques, dosing techniques, and clever analysis of behavior. He is widely praised by faculty members and fellow students as a leader and a “doer” ... someone who gets things done. He has published 3 research papers in refereed journals and a popular article in American Bee Journal. Important to this award, David’s fellow students clearly hold him in high regard as a critical thinker who helps with design and interpretation of research and enjoys interacting with others.

## **2000 Entomology Educational Project Awards**

Presented by  
The Board Certified Entomologists of Mid-America

### **Book**

In Ohio’s Backyard the Periodical Cicadas  
Gene Gritsky  
College of Mount St. Joseph, The Ohio Biological  
Survey, and Ohio Department of Natural Resources,  
Division of Wildlife.

### **Extension Bulletin**

Integrated Pest Management of Alfalfa Insects in the  
Upper Midwest  
Kris Giles, John Obrycki, Marlin Rice, Larry Pedigo,  
Steve Barnhart, David Hogg, Todd DeGooyer, Dennis  
Keeney and Joseph Munyaneza  
Iowa State University and the Leopold Center for  
Sustainable Agriculture

### **Newsletter Article**

Monarchs and *Bt* corn: Questions and Answers  
Marlin Rice  
Iowa State University

### **Video Tape**

Insect Parasitic Nematodes: Tools for Pest Management  
Randy Gaugler, Randy Nemitz, Michael Klein, Harry  
Kaya, David Shetlar, Parwinder Grewal, Lynn Lebeck  
and Chris Dicus.  
Northeast Region USDA, SARE Project.

### **WWW site**

Insect Parasitic Nematodes: Tools for Successful Insect  
Control  
Parwinder Grewal, Lynn LeBeck, Mary Barbercheck,  
Kirk Smith, Peter Shearer, Sridhar Polavarapu,  
Michael Wilson and Randy Gaugler  
The Ohio State University



**PROGRAM**  
**Sunday, March 26, 2000**

**Registration**

1:00-7:00 PM  
2<sup>nd</sup> floor lobby

**NCB Executive Committee**

1:00-5:00 PM  
Coffman

**Insect Photo Salon**

5:00-7:00 PM  
Nolte

*Host*

**James Mertins**

USDA-APHIS-NVSL-PL  
Ames, IA

**Linnaean Games**

5:00-7:00 PM  
University Ballroom C+D

*Games Master*

**Marlin Rice**

Department of Entomology  
Iowa State University  
Ames, IA

**Poster Set Up  
Student Competition  
and Sections A,B,C**

4:00-8:00 PM  
Humphrey

## Sunday Evening

### Special Program

#### Entomological beginnings in the Heartland

7:00 – 9:00 PM

University A+B

#### *Organizers*

##### **W. E. Miller**

Department of Entomology

University of Minnesota

St. Paul, MN 55108

##### **R. A. Weinzierl**

Department of Crop Sciences

University of Illinois

Urbana, IL 61807

#### *Moderator*

##### **R. A. Weinzierl**

Department of Crop Sciences

University of Illinois

Urbana, IL 61807

- 7:00 PM      1    Introduction. **W.E. Miller**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108 and **R.A. Weinzierl**, Dept of Crop Sciences, Univ of Illinois, Urbana, IL 61801
- 7:05 PM      2    The legacy of Otto Luggler (1844-1901). **V.J. Cervenka**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108

- 7:35 PM 3 Historical roots and development of aquatic entomology in the Heartland. **R.A. Hellenthal**, Dept of Biological Sciences, Univ of Notre Dame, Notre Dame, IN 46556-0369
- 8:05 PM 4 Englishman on the prairie: B.D. Walsh, first State Entomologist of Illinois. **C.A. Sheppard**, Dept of Entomology, Washington State Univ, Pullman, WA 99164-6382
- 8:35 PM 5 A history of forest entomology at the Univ of Minnesota. **S.A. Katovich**, Northeastern Area, State & Private Forestry, USDA Forest Service, St. Paul, MN 55108
- 9:05 PM 6 Concluding remarks. **W.E. Miller**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108 and **R.A. Weinzierl**, Dept of Crop Sciences, Univ of Illinois, Urbana, IL 61801

**Monday, March 27, 2000**  
**Morning**

**Continental Breakfast**

6:30-8:00 AM  
Humphrey and Campus  
(Guests are welcome)

**Registration**

8:00 AM – 5:00 PM  
2<sup>nd</sup> floor lobby

**Refreshment break**

9:30 – 10:00 AM  
Faculty + foyer  
Sponsored by Novartis Crop Protection

**Opening Session and Preliminary  
Business Meeting**

8:00-9:30 AM  
University Ballroom A–D

**Welcome to Minneapolis, Minnesota**

**Mark E. Ascerno, Head**  
Department of Entomology  
University of Minnesota

**Call to Order**

**David J. Horn, President**  
North Central Branch  
Entomological Society of America

**Local Arrangements Update**

**Edward B. Radcliffe**  
Chairman, Local Arrangements Committee

**Opening Remarks**

**Sharon S. Quisenberry, President**  
Entomological Society of America

**Comments from National ESA Office**

**James E. Olmes, Executive Director**  
Entomological Society of America

**President's Address**

**David J. Horn**

**Preliminary Business Meeting**

**Board Certified Entomologists-Update**

**Shripat T. Kamble**  
National Director, BCE

# NCB President's Symposium: Branching Out in the Branch

9:45 AM - Noon

University Ballroom A–D

## *Organizer and Moderator*

**David J. Horn**

Dept of Entomology  
The Ohio State University  
Columbus, OH 43210

- 9:45 AM 7 Introduction. **D.J. Horn**, Dept of Entomology, The Ohio State Univ, Columbus, OH 43210
- 9:55 AM 8 Ohio Valley Entomological Association: history, purpose and interaction with the North Central Branch. **R.H. Ratcliffe**, USDA ARS, Dept of Entomology, Purdue Univ, West Lafayette, IN 47907
- 10:15 AM 9 The liberal art of entomology. **G.A. Pearson**, Dept of Biology, Albion College, Albion, MI 49224
- 10:35 AM 10 1890/1962 Land Grant collaboration within the North Central Branch. **J.D. Sedlacek**, CRS, Kentucky State Univ, Frankfort, KY 40601
- 10:55 AM 11 It's all happening at the zoo - Cincinnati Zoo's World of the Insect exhibit. **R.C. Morgan**, Cincinnati Zoo Insectarium, Cincinnati, OH 45220
- 11:15 AM 12 Bugging your community. **J.N. Greenberg** and K.T. Williams, Bell Museum of Natural History, Minneapolis, MN 55455
- 11:35 AM 13 The Ohio Lepidopterists: an active organization. **E.H. Metzler**, The Ohio Lepidopterists, Columbus, OH 43229-1306
- 11:55 AM 14 Concluding remarks. **D.J. Horn**, Dept of Entomology, The Ohio State Univ, Columbus, OH 43210

# Student Poster Competition

8:00 AM - 5:00 PM

**Authors present 4:00 – 5:00 PM**

Humphrey

- D15 A Molecular phylogeny for *Diabrotica* beetles (Coleoptera: Chrysomelidae) based on mitochondrial and nuclear gene sequences. **T.L. Clark**, L.J. Meinke and J.E. Foster, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583-0816
- D16 A Genetic differentiation of *Cerotoma trifurcata* (Forster) populations, assessed using PCR-RFLP analysis of mitochondrial DNA. **S. Parimi**, T.L. Clark, L. Alamalakala, S.D. Danielson, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583 and J.E. Foster, Univ of Nebraska at Lincoln, Lincoln, NE 68583
- D17 A Development of PCR-based diagnostic molecular markers for the primary screwworm (*Cochliomyia hominivorax*) populations. **L. Alamalakala**, Univ of Nebraska, Lincoln, NE 68583-0816; S.R. Skoda and J.E. Foster, Dept of Entomology, Univ of Nebraska at Lincoln, Lincoln, NE 68583-0816
- D18 B Effect of parasitism by three novel-association braconid endoparasitoids (*Cotesia flavipes* complex) on the hemolymph proteins of three pyralid stem borers (*Diatraea* spp. and *Ostrinia nubilalis*). **M. Alleyne**, Dept of Entomology, Univ of Illinois, Urbana, IL 61801 and R.N. Wiedenmann, Illinois Natural History Survey, Champaign, IL 61820
- D19 B Inhibition of bacterial b-galactosidase activity by burying beetle secretions. **A.A. Bishop**, W.W. Hoback, J.J. Shafer and J.M. Scalzetti, Univ of Nebraska at Kearney, Kearney, NE 68849
- D20 C Monoterpenoids as controls for the *Varroa jacobsoni*. **C.A. Fassbinder**, J.A. Grodnitzky and J.R. Coats, Iowa State Univ, Ames, IA 50011-3140
- D21 D Attraction of female *Phormia regina* (Diptera: Calliphoridae) to presence of conspecific eggs. **K. Kelly** and G. Pearson, Dept of Biology, Albion College, Albion, MI 49224

- D22 D Assessing house fly abundance outdoors: evaluation of different traps through mark-release-recapture. **S.C. Kuha** and R.D. Moon, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108-6125
- D23 D Virulence and persistence of *Steinernema feltiae* towards the house fly (*Musca domestica*) in cattle manure. **B.P. Clark**, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583-0938; D.B. Taylor, MLIRU, USDA ARS, Lincoln, NE 68583-0938; A.L. Szalanski, Nebraska Game and Parks Commission, Lincoln, NE 68583 and T.O. Powers, Dept of Plant Pathology, Univ of Nebraska, Lincoln, NE 68583
- D24 F Influence of host quality on wheat curl mite (*Aceria tosichella*) movement. **J.A. Thomas** and G.L. Hein, Panhandle Research and Extension Center, Univ of Nebraska, Scottsbluff, NE 69361
- D25 F Effect of insecticides used in corn and sorghum on the predator *Orius insidiosus* (Say) (Hemiptera: Anthocoridae). **M.A. Al-Deeb** and G.E. Wilde, Kansas State Univ, Manhattan, KS 66506-4004
- D26 F Evaluation of a kairomone-baited trap for monitoring adult western corn rootworm (Coleoptera: Chrysomelidae) populations in corn (*Zea mays* L.). **C.S. Wamsley** and G.E. Wilde, Dept of Entomology, Kansas State Univ, Manhattan, KS 66506



## Submitted Posters

### Sections A, B, C

8:00 AM - 5:00 PM

Authors present 4:00 – 5:00 PM

Humphrey

- D27 A Mitochondrial gene order and arthropod evolution. **R.L. Roehrdanz** and M.E. Degrugillier, RRVARC BRL, USDA ARS, Fargo, ND 58105
- D28 B Repellent activity of catnip and osage orange fruit to the German cockroach. **C. Peterson**, Iowa State Univ, Ames, IA 50011; L. Nemetz, Medical College of Milwaukee, Milwaukee, WI 53226; L. Jones, Millikin Univ, Decatur, IL 62522 and J. Coats, Iowa State Univ, Ames, IA 50011
- D29 B Identification of a family IV cytochrome P450 gene fragment from insecticide resistant and susceptible Western corn rootworms. **M.E. Scharf**, B.D. Siegfried and L.J. Meinke, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583-0816
- D30 B Segment complexity and identification of repeat element gene family members on segment I of the *Camponotus pennsylvanicus* ichnovirus. **R. Hilgarth** and B. Webb, Dept of Entomology, Univ of Kentucky, Lexington, KY 40546
- D31 B Effect of an artificial diet on the reproductive development of the predacious spined soldier bug, *Podisus maculiventris* (Say)(Heteroptera: Pentatomidae). **T.A. Coudron**, Biological Control of Insects Research Laboratory, USDA ARS, Columbia, MO 65203; J.L. Wittmeyer, Univ of Missouri-Columbia, Columbia, MO 65201; T.S. Adams, USDA ARS, Fargo, ND and S.L. Brandt, Univ of Missouri-Columbia, Columbia, MO 65201
- D32 B Characterization of cross resistance among purified *Bt* toxins in laboratory selected strains of the European corn borer. **B.D. Siegfried**, H. Siqueira, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583-0816; D.J. Moellenbeck, Pioneer Hi-Bred International, Johnston, IA 50131-0085 and T. Spencer, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583-0816

- D33 B Dose-response of *Danaus plexippus* neonate larvae to purified *Bt* endotoxins. **J. Nearman**, B. Siegfried and T. Spencer, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583-0816
- D34 B Methoprene effect on *Aedes aegypti* larval development. **C.A. Grier** and Q. Lan, Univ of Northern Iowa, Cedar Falls, IA 50613
- D35 B Bursicon immunoreactive neurons in the moth *Manduca sexta*. **K.A. Mesce**, K.A. Klukas, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108 and H.W. Honegger, Dept of Biology, Vanderbilt Univ, Nashville, TN 37240
- D36 C Diet affects western corn rootworm vigor and movement. **J.L. Spencer**, Center for Economic Entomology, Illinois Natural History Survey, Champaign, IL 61820-6917; T.R. Mabry, Dept of Crop Sciences, Univ of Illinois, Urbana, IL 61801; S.A. Isard, Dept of Geography, Univ of Illinois, Urbana, IL 61801 and E. Levine, Center for Economic Entomology, Illinois Natural History Survey, Champaign, IL 61820-6917
- D37 C Dispersal patterns of *Chrysochus auratus* in a patchy environment. **M.J. St. Pierre** and S.D. Hendrix, Dept of Biological Sciences, Univ of Iowa, Iowa City, IA 52242
- D38 C Cabbage root maggot, *Delia radicum*, an emerging pest of canola in the prairies. **A.K. Hawkins-Bowman** and N.J. Holliday, Dept of Entomology, Univ of Manitoba, Winnipeg, MB R3T 2N2, Canada
- D39 C Resistance to crop rotation affects seasonal abundance of western corn rootworms in corn and soybean fields: a comparison at five Illinois sites. **E. Levine**, J.L. Spencer, Illinois Natural History Survey, Champaign, IL 61820; S.A. Isard, Dept of Geography, Univ of Illinois, Urbana, IL 61801; E.A. Adee, A.H. Anderson, R.A. Hines, L.E. Paul and G.A. Raines, Dept of Crop Sciences, Univ of Illinois, Urbana, IL 61801
- D40 C Effects of host feeding breadth on the fates of ingested terpenoids in Lymantriidae. **J.S. Powell** and K.F. Raffa, Dept of Entomology, Univ of Wisconsin, Madison, WI 53706

- D41 C Influence of temperature on the functional response of the parasitoid, *Anisopteromalus calandrae*, to the lesser grain borer, *Rhyzopertha dominica*. **A. Menon**, Dept of Grain Science and Industry, Kansas State Univ, Manhattan, KS 66506; P.W. Flinn, Grain Marketing and Production Research Center, USDA -ARS, Manhattan, KS 66502 and B.A. Dover, Department of Entomology, Kansas State University, Manhattan, KS 66506
- D42 C Ground activity of a guild of plant-dwelling predatory Hemiptera. **C.B. Raymond** and K.V. Yeorgan, Dept of Entomology, Univ of Kentucky, Lexington, KY 40546-0091
- D43 C Within- and between-trophic level interactions involving musk thistle weevils. **L.R. Milbrath**, J.R. Nechols and W.H. Fick, Dept of Entomology, Kansas State Univ, Manhattan, KS 66506
- D44 C Parasitism of masked chafer, *Cyclocephala* spp., grubs (Coleoptera: Scarabaeidae) in turfgrass by a native tephritid wasp. **M.E. Rogers** and D.A. Potter, Dept of Entomology, Univ of Kentucky, Lexington, KY 40546-0091
- D45 C Variation in response to prey-induced plant volatiles among inbred lines of a predatory mite. **D.C. Margolies** and F. Jia, Dept of Entomology, Kansas State Univ, Manhattan, KS 66506-4004
- D46 C Predators impairing parasitoids in a biological control program. **E. Ferreira Vilela**, R. Reis Jr., O. DeSouza, Departamento de Biologia Animal - Campus Universitario s/n - Brazil, Universidade Federal de Vicosa, Vicosa, Brazil and J.E. Foster, Univ of Nebraska, Lincoln, NE 68583-0816
- D47 C Surveillance for potential keystone zygoteran predators along the Ohio River. **R.L. Stewart Jr.**, Malone College, Canton, OH 44709-3897 and S.W. Chordas III, Museum of Biological Diversity, The Ohio State Univ, Columbus, OH 43210
- D48 C *Aphthona* flea beetle establishment effected by soil composition and root growth pattern. **D.A. Mundal**, R.B. Carlson and D.L. Olson, Dept of Entomology, North Dakota State Univ, Fargo, ND 58105

- D49 C Effect of water management and ivy geranium cultivar (*Pelargonium peltatum* (L.) L'Her ex Ait.) on two spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae), development and population growth. **G. Opit**, Dept of Entomology, Kansas State Univ, Manhattan, KS 66506-4004; V. Jonas, Dept of Horticulture, Forestry, & Recreational Resources, Kansas State Univ, Manhattan, KS 66506; D. Margolies, J. Nechols, Dept of Entomology, Kansas State Univ, Manhattan, KS 66506-4004 and K. Williams, Dept of Horticulture, Forestry, & Recreational Resources, Kansas State Univ, Manhattan, KS 66506
- D50 C Brood odor detection and antennal morphology of hygienic and non-hygienic honey bees, *Apis mellifera* L. **S. Chinta**, M. Spivak and K. Mesce, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108-6125
- D51 C A survey of homopteran insects in four varieties of alfalfa. **R.J. Alleman** and D.B. Hogg, Univ of Wisconsin, Madison, WI 53705
- D52 C Male and female premating behavioral sequence differences in two species of wolf spider. **K.J. Delaney**, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583-0816

# **Monday Afternoon**

## **Refreshment Break**

Humphrey + Campus

3:00 - 4:00 PM

Sponsored by Elf Atochem North America, Inc.

**Symposium**  
**Genetically modified foods: current  
perceptions of safety and acceptance**

1:20 - 5:45 PM  
University Ballroom A+B

***Organizer and Moderator***

**C. Michael Smith**

Department of Entomology  
Kansas State University  
Manhattan, KS 66506

- |         |    |  |
|---------|----|--|
| 1:20 PM | 53 | Introduction. <b>C.M. Smith</b> , Dept of Entomology, Kansas State Univ, Manhattan, KS 66506   |
| 1:30 PM | 54 | Applications of biotechnology to crop improvement. <b>D. Sommers</b> , Dept of Agronomy, Univ of Minnesota, Minneapolis, MN 55455                            |
| 2:00 PM | 55 | Consumer perceptions of genetically modified foods. <b>R. Bessin</b> , Dept of Entomology, Univ of Kentucky, Lexington, KY 40546                             |
| 2:30 PM | 56 | EPA Regulation of Insect Resistance Management in B.t. Crops. <b>S. Matten</b> , USEPA/Biopesticides and Pollution Prevention Division, Washington, DC 20460 |
| 3:00 PM |    | Break  |
| 3:15 PM | 57 | From monarchs to corporate concentration: consumers weigh in on the GE debate. <b>G. Flora</b> , Institute for Agriculture and Trade Policy, Minneapolis, MN |
| 3:45 PM | 58 | The rise and fall of GMO's in the food industry. <b>D. Steevens</b> , R. D. Offutt Inc., Park Rapids, MN   |
| 4:15 PM | 59 | Understanding GMOs as a social issue. <b>E. Abbott</b> , Greenlee School of Journalism & Communication, Iowa State Univ, Ames, IA 50011                      |
| 4:45 PM | 60 | Consumer perspectives on food biotechnology. <b>S. Pitman</b> , International Food Information Council, Washington, DC                                       |

5:15 PM 61 Concluding remarks. **C.M. Smith**, Dept of  
Entomology, Kansas State Univ, Manhattan,  
KS 66506

**Symposium**  
**Ecology, geography and risk assessment**  
**of ticks & tick borne disease in the North**  
**Central Region**

1:20 - 4:45 PM

Regents

***Organizer and Moderator***

**Timothy J. Kurtti**

Department of Entomology

University of Minnesota

St. Paul, MN 55108

- |         |    |   |
|---------|----|---|
| 1:20 PM | 62 | Introduction. <b>T.J. Kurtti</b> , Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108  |
| 1:30 PM | 63 | Michigan and ticks: invasion and establishment. <b>E.D. Walker</b> , Dept of Entomology, Michigan State Univ, East Lansing, MI 48824  |
| 2:00 PM | 64 | Distribution of <i>Ixodes scapularis</i> in Canada: results from active and passive surveillance. <b>L.R. Lindsay</b> , Health Canada, Canadian Science Centre for Human and Animal Health, Winnipeg, Canada; I.K. Barker, Canadian Cooperative Wildlife Health Centre, Dept of Pathobiology, Univ of Guelph, Guelph, Canada; H. Artsob, Health Canada, Canadian Science Centre for Human and Animal Health, Winnipeg, Canada and T.G. Galloway, Dept of Entomology, Univ of Manitoba, Winnipeg, Canada |
| 2:30 PM | 65 | A risk assessment of an emerging focus of Lyme Disease in Minnesota. R.C. Johnson, Univ of Minnesota, Minneapolis, MN 55455; <b>D.F. Neitzel</b> , Minnesota Dept of Health, Minneapolis, MN 55455 and J. Jarnefeld, Metropolitan Mosquito Control District, St. Paul, MN 55104   |
| 3:00 PM |    | Break   |



- 3:15 PM 66 Tick distribution and risk in the Minneapolis - Saint Paul area. **J.L. Jarnefeld**, Metropolitan Mosquito Control District, St. Paul, MN 55104-3431
- 3:45 PM 67 Epizootiology of human granulocytic ehrlichiosis (HGE) in the northcentral U.S. **M.D. Ravyn**, C.B. Kodner, Y. Xu, S.E. Carter, L.L. Lamb, Dept of Microbiology, Univ of Minnesota, Minneapolis, MN 55455; J.L. Jarnefeld, Metropolitan Mosquito Control District, St. Paul, MN 55104-3431 and R.C. Johnson, Dept of Microbiology, Univ of Minnesota, Minneapolis, MN 55455
- 4:15 PM 68 *Ixodes scapularis* population modulation in an Illinois Lyme disease focus. **C.J. Jones** and U.D. Kitron, College of Veterinary Medicine, Univ of Illinois, Urbana, IL 61802
- 4:45 PM 69 Concluding remarks. **T.J. Kurtti**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108

**Symposium**  
**Advances in landscape IPM**

1:20 - 5:45 PM

Presidents

***Organizers and Moderators***

**Vera Krischik**

Department of Entomology  
University of Minnesota  
St. Paul, MN 55108

**Clifford S. Sadof**

Department of Entomology  
Purdue University  
W. Lafayette, IN 47907

- |         |    |   |
|---------|----|---|
| 1:20 PM | 70 | Introduction. <b>C.S. Sadof</b> , Dept of Entomology, Purdue Univ, West Lafayette, IN 47907-1158 and <b>V. Krischik</b> , Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108   |
| 1:30 PM | 71 | Advances in elm resistance to defoliating insect pests. <b>F. Miller</b> , Countryside Extension Center, Univ of Illinois - Extension, Countryside, IL 60525 and G. Ware, Research Associate, The Morton Arboretum, Lisle, IL 60532                     |
| 2:00 PM | 72 | Carbon/nitrogen budget of trees and herbivore resistance: implications for plant health care. <b>D.A. Herms</b> , Dept of Entomology, The Ohio State Univ, Wooster, OH 44691  |
| 2:30 PM | 73 | Effects of urban ecosystems on elm resistance. <b>V. Krischik</b> , Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108   |
| 3:00 PM |    | Break   |
| 3:15 PM | 74 | Landscape factors contributing to insect outbreaks on honeylocust. <b>C.S. Sadof</b> , Dept of Entomology, Purdue Univ, West Lafayette, IN 47907-1158 and C. Sperry, Dept of Forestry and Natural Resources, Purdue Univ, West Lafayette, IN 47907-1158 |

- 3:45 PM 75 The potential for conservation biological control in ornamental landscapes. **L.M. Hanks**, Dept of Entomology, Univ of Illinois, Urbana, IL 61801
- 4:15 PM 76 Effects of plant architecture on biological control in ornamental systems. **R. Cloyd**, Dept of Natural Resources Environmental Sciences, Univ of Illinois, Urbana, IL 61801
- 4:45 PM 77 Population dynamics of the horned oak gall wasp on pin oak. **E. Eliason** and D. Potter, Univ of Kentucky, Lexington, KY 40546
- 5:15 PM 78 Advances in azalea lace bug management. **K. Braman**, Dept of Entomology, Georgia Station, Univ of Georgia, Griffin, GA 30223
- 5:45 PM 79 Concluding remarks. **C.S. Sadof**, Dept of Entomology, Purdue Univ, West Lafayette, IN 47907-1158 and **V. Krischik**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108

**Student Competition**  
**Submitted 10-Minute Papers**

3:15 – 5:00 PM

Alumni

*Moderator*

**R. A. Weinzierl**

Department of Crop Sciences

University of Illinois

Urbana, IL

- 3:15 PM B 80 Effect of event 176 *Bt* corn on survival and development of second generation European corn borer, *Ostrinia nubilalis* (Hübner) (Lepidoptera:Crambidae). **A.C. Zoerb**, B.D. Siegfried, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583; R.L. Hellmich, Corn Insects and Crop Genetics Research Unit, USDA ARS, Ames, IA 50011 and R.J. Wright, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583
- 3:27 PM C 81 Competitive interactions between introduced honey bees and the native bee, *Bombus impatiens*. **E.C. Evans**, Univ of Minnesota, St. Paul, MN 55108-6125
- 3:39 PM C 82 Detecting and assessing *Varroa* mite infestations by using powdered sugar to dislodge mites. **P.A. Macedo** and M.D. Ellis, Univ of Nebraska, Lincoln, NE 68583-0816
- 3:51 PM C 83 Responses of gypsy moth larvae to variation in quaking aspen phytochemistry: roles of induction, resource availability and plant genotype. **T.L. Osier** and R.L. Lindroth, Univ of Wisconsin, Madison, WI 53706
- 4:03 PM C 84 The effects of elevated CO<sub>2</sub> and chronic O<sub>3</sub> on aspen blotch leafminer and trembling aspen. **B.J. Kopper** and R.L. Lindroth, Univ of Wisconsin, Madison, WI 53706
- 4:15 PM C 85 Laboratory assessment of host suitability of *Pieris rapae* for *Trichogramma brassicae*. **J. Lundgren** and G. Heimpel, Univ of Minnesota, St. Paul, MN 55108

- 4:27 PM F 86 The influence of western corn rootworm beetle feeding on soybean in Northwest Indiana. **D. Rule**, C.R. Edwards and L.W. Bledsoe, Purdue Univ, West Lafayette, IN 47907-1158
- 4:39 PM F 87 Development and validation of a model for predicting the seasonal emergence of corn rootworm beetles in Iowa. **T.M. Nowatzki** and J.J. Tollefson, Dept of Entomology, Iowa State Univ, Ames, 50011
- 4:51 PM F 88 AgipMNPV - a nucleopolyhedrovirus with potential for control of the black cutworm. **A.J. Boughton**, Dept of Entomology, Iowa State Univ, Ames, IA 50011; L.C. Lewis, Corn Insect Research Unit, USDA ARS, Ames, IA 50011 and B.C. Bonning, Dept of Entomology, Iowa State Univ, Ames, IA 50011

## **Monday Evening**

### **Insect Photo Salon**

6:00-8:00 PM

Nolte

*Host*

**Phillip E. Sloderbeck**

Kansas State University

Garden City, KS

### **Finals**

#### **Linnaean Games**

6:00-8:00 PM

University Ballroom C+D

*Games Master*

**Marlin Rice**

Department of Entomology

Iowa State University

**Ames, IA**

### **Poster Set Up**

#### **Sections D, E, F**

6:00 - 10:00 PM

Humphrey

### **Branch Mixer**

8:00 – 11:00 PM

Faculty and adjacent foyer

**Tuesday, March 28, 2000**  
**Morning**

**Continental Breakfast**

6:30-8:00 AM  
Coffe Lounge & Foyer  
Sponsored by Bayer Corp.  
(Guests are welcome)

**Registration**

8:00 AM – 5:00 PM  
2<sup>nd</sup> floor lobby

**NCB Executive Committee**

8:00-12:00 Noon  
Coffman

**Refreshment Break**

Humphrey + Campus  
10:00 - 10:30 AM  
Sponsored by Aventis CropScience

**Symposium**  
**Aquatic insects and habitat management**  
**issues in the Upper Mid-West**

7:50 – 11:45 AM

Regents

***Organizer and Moderator***  
**Leonard C. Ferrington, Jr.**

Department of Entomology  
University of Minnesota  
St. Paul, MN 55108

- |          |    |   |
|----------|----|---|
| 7:50 AM  | 89 | Introduction. <b>L.C. Ferrington, Jr.</b> , Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108   |
| 8:00 AM  | 90 | Cranberry operation effects on benthic macroinvertebrates, water quality, and sediment pesticide concentrations of the St. Croix National Scenic Riverway. <b>P.M. Stewart</b> and J.T. Butcher, Biological Resources Division, Lake Michigan Ecological Research Station, U.S. Geological Survey, Porter, IN 46304 |
| 8:30 AM  | 91 | An aquatic invertebrate Index of Biotic Integrity (IBI) for wetlands. <b>J. Helgen</b> , Minnesota Pollution Control Agency, St. Paul, MN 55101   |
| 9:00 AM  | 92 | Development of an invertebrate Index of Biotic Integrity for the St. Croix River basin, Minnesota. <b>J. Chirhart</b> , Minnesota Pollution Control Agency, St. Paul, MN  |
| 9:30 AM  | 93 | The influence of urbanization on invertebrate community composition in small streams draining the Minneapolis-St. Paul metropolitan area, Minnesota, 1997. <b>K.E. Lee</b> and J.R. ZumBerge, U.S. Geological Survey, Mounds View, MN 55112   |
| 10:00 AM |    | Break   |



- 10:15 AM 94 Understanding spatial distribution of aquatic insects in Minnesota River tributaries: it's a matter of scale. **J.A. Perry** and A. Gleason, Univ of Minnesota, St. Paul, MN 55108
- 10:45 AM 95 Non-target wetland insect populations in relation to larval mosquito control with Bti and methoprene. **N. Read**, Metropolitan Mosquito Control District, St. Paul, MN 55104
- 11:15 AM 96 Biological assessment in prairie lake littoral zones: identifying hotspots to facilitate lake management. **N.H. Troelstrup, Jr.**, Dept of Biology & Microbiology, South Dakota State Univ, Brookings, SD 57007
- 11:45 AM 97 Concluding remarks. **L.C. Ferrington, Jr.**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108

**Symposium**  
**Management of stored product insects in  
the 21st century: uncertainties and  
challenges, Part 1**

7:50 – 11:45 AM

Faculty

***Organizers***

**Bh. Subramanyam**

Department of Grain Science and Industry  
Kansas State University  
Manhattan, KS 66506

**Phillip K. Harein**

Department of Entomology  
University of Minnesota  
St. Paul, MN 55108

***Moderator***

**Bh. Subramanyam**

Department of Grain Science and Industry  
Kansas State University  
Manhattan, KS 66506

- |         |     |   |
|---------|-----|---|
| 7:50 AM | 98  | Introduction. <b>B. Subramanyam</b> , Dept of Grain Science and Industry, Kansas State Univ, Manhattan, KS 66506  |
| 8:00 AM | 99  | Uncertainties associated with future stored product pest management tools. <b>J.E. Sargent</b> , Copesan Services, Brookfield, WI 53005                                   |
| 8:30 AM | 100 | Management of stored-product insects in the new millennium: perspectives from the grain, food and feed industry. <b>B. Richardson</b> , General Mills, Plymouth, MN 55426 |
| 9:00 AM | 101 | Stored product entomology, Food and Drug Administration and food safety. <b>J.A. Barron</b> , Southeast Regional Laboratory, FDA, Atlanta, GA 30309                       |

- 9:30 AM 102 Applications of near-infrared (NIR) spectroscopy to stored-product entomology. J.E. Baker, F.E. Dowell, **J. Perez-Mendoza** and J.E. Throne, Grain Marketing and Production Res Ctr, USDA ARS, Manhattan, KS 66502
- 10:00 AM Break
- 10:15 AM 103 Transgenic avidin maize is resistant to stored-product insects. **K.J. Kramer**, GMPRC, USDA ARS, Manhattan, KS 66502
- 10:45 AM 104 Optimizing food processing plant fumigations. **S. Prabhakaran**, Dow AgroSciences, Mooresville, IN 46158; R.E. Williams, Dow AgroSciences, Moorpark, CA and B.M. Schneider, Dow AgroSciences, Indianapolis, IN 46268
- 11:15 AM 105 Ozone: a potential grain fumigant. **L.J. Mason**, Dept of Entomology, Purdue Univ, West Lafayette, IN 47907; C.P. Woloshuk, F. Mendoza, Dept of Botany & Plant Pathology, Purdue Univ, West Lafayette, IN 47907 and D.E. Maier, Agricultural and Biological Engineering, Purdue Univ, West Lafayette, IN 47907

# Submitted 10-Minute Papers

## Section C

8:00 – 10:12 AM

University Ballroom A

### *Moderator*

**D. B. Hogg**

Department of Entomology

University of Wisconsin

Madison, WI

- 8:00 AM C 106 Habitat effects on parasitoids of the evergreen bagworm (Psychidae: Lepidoptera). **J.A. Ellis** and L.M. Hanks, Univ of Illinois, Urbana, IL 61802
- 8:12 AM C 107 Inverse relationship between damage by bark beetles and abundance of their major predators in red pine plantations in Wisconsin. **N. Erbilgin** and K.F. Raffa, Dept of Entomology, Univ of Wisconsin, Madison, WI 53706
- 8:24 AM C 108 Implication of feeding niche on biological control of wood-boring beetles (Coleoptera: Cerambycidae). **M.D. Ginzel**, J.F. Tooker and L.M. Hanks, Univ of Illinois, Urbana, IL 61801
- 8:36 AM C 109 Interacting effects of predation and competition on within-tree reproduction by *Ips pini*. **B.H. Aukema** and K.F. Raffa, Univ of Wisconsin, Madison, WI 53706
- 8:48 AM C 110 Natural selection on egg size in a seed beetle: variation among hosts. **C.W. Fox**, Dept of Entomology, Univ of Kentucky, Lexington, KY 40546-0091
- 9:00 AM C 111 Ovipositional preference of a lady beetle, *C. maculata*, for selected weeds in sweet corn fields. **M. Griffin**, Dept of Entomology, Univ of Kentucky, Lexington, KY 40546-0091 and K.V. Yeargan, The Univ of Kentucky, Lexington, KY 40546-0091

- 9:12 AM C 112 Survivorship of immersion differs among three *Diabrotica* species (Coleoptera: Chrysomelidae). **W.W. Hoback**, Univ of Nebraska at Kearney, Kearney, NE 68583; T.L. Clark, L.G. Higley and L.J. Meinke, Univ of Nebraska at Lincoln, Lincoln, NE 68849
- 9:24 AM C 113 Flowering plant hosts of adult hymenopteran parasitoids of central Illinois. **P.F. Reagel**, J.F. Tooker and L.M. Hanks, Univ of Illinois, Urbana, IL 61801
- 9:36 AM C 114 Population crash of an invading species, alfalfa blotch leafminer (Diptera: Agromyzidae), in Wisconsin. **T.J. Davis**, D.B. Hogg and J.L. Wedberg, Univ of Wisconsin, Madison, WI 53706
- 9:48 AM C 115 Laboratory assays and field trials of candidate monoterpenoids and two registered acaricides for *Varroa* mite control. **M. Ali**, M.D. Ellis, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583-0816 and J.R. Coats, Iowa State Univ, Ames, IA 50011
- 10:00 AM C 116 The effect of four *Varroa* mite infestation levels on overwintering honey bee colonies in the North Central U.S. **M. Ali** and **M.D. Ellis**, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583-0816

## Submitted Posters

### Sections D, E, F

8:00 AM - 5:00 PM

**Authors present 1:00 – 2:00 PM**

Humphrey

- D117 D The effect of dietary protein level and population density on adults of the primary screwworm (Diptera: Calliphoridae) reared at different temperatures. **A. Sagel**, Univ of Nebraska, Lincoln, NE 68583-0816; D.R. Berkebile, S.R. Skoda, USDA ARS, Univ of Nebraska, Lincoln, NE 68583-0938 and J.E. Foster, Univ of Nebraska, Lincoln, NE 68583-0816
- D118 D Survey of resistance to coumaphos and ethion among laboratory reared screwworm (Diptera: Calliphoridae) strains. **D.R. Berkebile** and S.R. Skoda, USDA ARS, Lincoln, NE 68583-0938
- D119 F Impact of row spacing on the effects of European corn borer *Ostrinia nubilalis* (Hübner) (Lepidoptera: Pyralidae) on corn grown for grain. **S.W. Myers** and J.L. Wedberg, Dept of Entomology, Univ of Wisconsin, Madison, WI 53706
- D120 F Improving the prediction of univoltine European corn borer moth flights with degree day modeling. **K.M. Gross** and P.A. Glogoza, Dept of Entomology, North Dakota State Univ, Fargo, ND 58105
- D121 F *Bt* corn performance under light univoltine corn borer pressure in South Dakota. **M.A. Catangui**, R.K. Berg and D.L. Mills, Plant Science Dept, South Dakota State Univ, Brookings, SD 57007
- D122 F Yield comparisons of *Bt* and non-*Bt* corn hybrids in Missouri under conditions of natural infestation of European corn borer, 1999. H.C. Minor, M. O'Day and **A.J. Keaster**, IPM Program, Univ of Missouri - Columbia, Columbia, MO 65211
- D123 F Yield comparisons of *Bt* and artificially and naturally infested non-*Bt* corn hybrids in Missouri, 1999. M. O'Day, H.C. Minor and **A.J. Keaster**, Univ of Missouri - Columbia, Columbia, MO 65211

- D124 E Planting date and the use of *Bt*-corn hybrids for European and southwestern corn borer control in Kentucky. **D. Johnson**, Dept of Entomology, Univ of Kentucky, REC, Princeton, KY 42445-0469; R. Bessin, Dept of Entomology, Univ of Kentucky, Lexington, KY 40546 and J. Herbek, Agronomy Dept, Univ of Kentucky, REC, Princeton, KY 42445
- D125 F Evaluation of *Bt* maize hybrids for European corn borer control. **I.O. Oyediran**, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583 and C.I. Reimers, Univ of Nebraska, Lincoln, NE 68583
- D126 F Evaluation of *Bt* transgenic maize to lesser cornstalk borer resistance. **F.M.F. Vilella**, Univ of Nebraska / UFV, Lincoln, NE 68583-0816; J.M. Waquil, Univ of Nebraska / Embrapa Milho e Sorgo, Lincoln, NE 68583-0816; E.F. Vilela, Departamento de Biologia Animal, Universidade Federal de Vicosa, Vicosa, Brazil; P.A. Viana, Embrapa Milho e Sorgo; R.E. Lynch, IBPMRL, USDA ARS, Tifton, GA 317930748 and J.E. Foster, Univ of Nebraska / UFV, Lincoln, NE 68583-0816
- D127 F Survival and development of the stalk borer, *Papaipema nebris*, on Cry1Ab and Cry9C *Bt* corn. **R.R. Newman** and M.E. Rice, Iowa State Univ, Ames, IA 50011
- D128 F Efficacy of TC1507 transgenic maize. **P.G. Bystrak**, Mycogen Seeds, Huxley, IA 50124; D. Moellenbeck, Pioneer Hi-Bred International, Inc., Johnston, IA 50121; J.W. Bing, B.A. Long, J.R. Rouse, J.L. Stewart, Mycogen Seeds, Huxley, IA 50124; M.L. Peters, L.S. Higgins and B.K. Gray, Pioneer Hi-Bred International, Inc., Johnston, IA 50121
- D129 F Dispersal of European and southwestern corn borer moths in *Bt* cornfields. **L.L. Buschman**, Dept of Entomology, Kansas State Univ, Garden City, KS 67846; P.E. Sloderbeck, Southwest Area Extension Office, Kansas State Univ, Garden City, KS 67846; R.L. Hellmich II, Corn Insects and Crop Genetics Res. Unit, USDA ARS, Ames, IA 50011; S.B. Ramaswamy and R.A. Higgins, Dept of Entomology, Kansas State Univ, Manhattan, KS 66506-4004

- D130 F Pollen drift from *Bt* corn: efficacy against European corn borer. C.D. Pilcher, Monsanto Agronomy Center, Monsanto Company, Monmouth, IL 61642; **M.E. Rice**, Dept of Entomology, Iowa State Univ, Ames, 50011; R.A. Higgins and R. Bowling, Dept of Entomology, Kansas State Univ, Manhattan, KS 66506
- D131 F *Bt* maize pollen and the monarch butterfly. **P.L. Clark**, T.L. Clark, Univ of Nebraska, Lincoln, NE 68583-0816; G. Dively, Dept of Entomology, Univ of Maryland, College Park, MD 20742; G.D. Jones, Texas A&M, College Station, TX 77845 and J.E. Foster, Univ of Nebraska, Lincoln, NE 68583-0816
- D132 E *Bt* corn and insect resistance management: farmer perceptions and educational opportunities. **M.E. Rice**, Dept of Entomology, Iowa State Univ, Ames, IA 50011 and C.D. Pilcher, Monsanto Agronomy Center, Monsanto Company, Monmouth, IL 61462
- D133 F Fitness of Dipel-susceptible and Dipel-resistant strains of European corn borer. **F. Huang**, R.A. Higgins, Dept of Entomology, Kansas State Univ, Manhattan, KS 66502 and L.L. Buschman, Dept of Entomology, Southwest Research-Extension Center, Kansas State Univ, Garden City, KS 67846
- D134 F Plant protection: environmental safety and policy issues. **C. Reimers-Hild** and J.E. Foster, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583-0816
- D135 F Introducing corn rootworm-protected corn. P. Davis, Monsanto Co., Ankeny, IA 50021; J. Pershing, Monsanto Co., St. Louis, MO 63198; T. DeGooyer, Monsanto Co., Bloomington, IL 61704; **S. Spangler**, Monsanto Co., Clive, IA 50325; T. Coombe, R. Knutson, Monsanto Co., St. Louis, MO 63198; C. Pilcher, Monsanto Co., Monmouth, IL 61462; A. Howe, Monsanto Co., St. Louis, MO 63198; S. Ford and M. Groth, Monsanto Co., St. Louis, MO 63198



- D136 F Corn rootworm control via transgenic maize. **M.L. Peters**, D.J. Moellenbeck, L.S. Higgins, M.J. Morrisey, L.M. Marshall, Pioneer Hi-Bred International, Johnston, IA 50131; J.W. Bing, P.G. Bystrak, B.A. Lang, J.R. Rouse and J.L. Stewart, Mycogen Seeds, Huxley, IA 50124
- D137 F Efficacy of transgenic corn protected against the corn rootworm (Coleoptera: Chrysomelidae) *Diabrotica* spp. **T.A. Wilson** and J.J. Tollefson, Iowa State Univ, Ames, IA 50011
- D138 F Development of a cucurbitacin-based adjuvant for adult corn rootworm control. **R.W. Behle** and M.R. McGuire, NCAUR, USDA ARS, Peoria, IL 61604-3999
- D139 F Efficacy of reduced rates of soil insecticides against western corn rootworms in narrow row corn. **T.A. DeVries** and R.J. Wright, South Central Res. & Ext. Center, Univ of Nebraska, Clay Center, NE 68933-0066
- D140 F Larval and adult corn rootworm sampling by crop rotation and nitrogen fertilization. **L. Hammack**, J.L. Pikul, Jr. and M.M. Ellsbury, Northern Grain Insects Research Laboratory, USDA ARS, Brookings, SD 57006
- D141 F Adult western corn rootworm sampling methods employed by Kansas crop consultants. **C.A. Daves**, Dept of Entomology, Kansas State Univ, Manhattan, KS 66506; R.A. Higgins, Dept of Entomology, Kansas State Univ, Manhattan, KS 66506 and P.E. Sloderbeck, Southwest Area Extension Office, Garden City, KS 67846-2804
- D142 F “Running On Empty”: influence of hunger on adult western corn rootworm activity. **T.R. Mabry**, Dept of Crop Sciences, Univ of Illinois, Urbana, IL 61801; J.A. Inman, Dept of Liberal Arts and Sciences, Univ of Illinois, Urbana, IL 61801; J.L. Spencer, Center for Economic Entomology, Illinois Natural History Survey, Champaign, IL 61820; S.A. Isard, Dept of Geography, Univ of Illinois, Urbana, IL 61801 and E. Levine, Center for Economic Entomology, Illinois Natural History Survey, Champaign, IL 61820

- D143 F Estimating grasshopper defoliation in soybean using the graphing paper technique. **D.L. Mills** and M.A. Catangui, Plant Science Dept, South Dakota State Univ, Brookings, SD 57007
- D144 F Imported longhorned weevil injury to soybean: consumption and multiple-species economic injury levels. **T.E. Hunt**, Haskell Agricultural Laboratory, Univ of Nebraska, Concord, NE 68728; L.G. Higley, Entomology Dept, Univ of Nebraska, Lincoln, NE 68583 and F.J. Haile, Dow AgroSciences, Indianapolis, IN 46268
- D145 F Effect of wheat curl mites on yield of wheat. **T.L. Harvey**, T.J. Martin and D.L. Seifers, Kansas State Univ, Hays, KS 67601
- D146 F Varietal resistance to the sugar beet root aphid. **G.L. Hein**, R. Harveson, J.A. Smith, R.G. Wilson and C.D. Yonts, Panhandle Res. & Ext. Center, Univ of Nebraska, Scottsbluff, NE 69361
- D147 F Measuring pesticide residues on fresh and processed produce in Michigan. **C.D. DiFonzo**, P.C. Bolin and C.E. Edson, Michigan State Univ, East Lansing, MI 48824-1302
- D148 E Aphid Alert: multimedia delivery of near real-time information on the population dynamics of aphid vectors of potato viruses in the Red River Valley of Minnesota and North Dakota. **R.A. Suranyi**, E.B. Radcliffe, D.W. Ragsdale and I.V. MacRae, Dept of Entomology, Univ of Minnesota, Saint Paul, MN 55108
- D149 E IR-4 helps minor crops survive FQPA. S. Perry and **C.D. DiFonzo**, Pesticide Education Program, Michigan State Univ, East Lansing, MI 48824
- D150 E Potato leafhopper populations in glandular haired alfalfa established with oats and their effects on yield. **M.S. Mackay**, J. Wedberg, D. Hogg and D. Undersander, Dept of Entomology, Univ of Wisconsin, Madison, WI 53706
- D151 F Strip harvesting in alfalfa as a trap crop for *Empoasca fabae* (Harris). **L.A. Weiser**, J.J. Obrycki, Iowa State Univ, Ames, IA 50011 and K.L. Giles, Oklahoma State Univ, Stillwater, OK 74078

D152 F Effectiveness of Spinosad on stored-product insects. **B. Subramanyam**, Dept of Grain Science and Industry, Kansas State Univ, Manhattan, KS 66506 and J. Nelson, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108

## **Tuesday Afternoon**

### **Awards Luncheon**

Noon – 1:45 PM  
University Ballroom A–D  
*Host*

**Karen Mesce**

Department of Entomology  
University of Minnesota

### **Refreshment Break**

3:00 - 4:00 PM  
Humphrey + Campus  
Sponsored by Novartis Crop Protection

### **North Central Branch Executive Committee Meeting**

4:00 – 5:30 PM  
Coffman

**Symposium**  
**Science and the public: insects as the  
missing link**

1:50 – 5:45 PM  
Nolte + foyer

***Organizers***

**Karen S. Oberhauser**

Department of Ecology, Evolution and Behavior  
University of Minnesota  
St. Paul, MN 55108

**Susan J. Weller**

Department of Entomology  
University of Minnesota  
St. Paul, MN 55108

***Moderator***

**Karen S. Oberhauser**

Department of Ecology, Evolution and Behavior  
University of Minnesota  
St. Paul, MN 55108

- 2:00 PM    154 Monarchs in the classroom: conservation, science and research for teachers, students and scientists. **K.S. Oberhauser**, Dept of Ecology, Evolution, and Behavior, Univ of Minnesota, St. Paul, MN 55108
- 2:30 PM    155 Monarch larval monitoring: a North American citizen scientist research project. **M. Prysby**, Dept of Ecology, Evolution, and Behavior, Univ of Minnesota, St. Paul, MN 55108
- 3:00 PM    Break
- 3:15 PM    156 Monarch monitoring and field research: a teacher/student/scientist collaboration. **L. Funderburk**, North View Junior High, Brooklyn Park, MN 55429
- 3:40 PM    157 Using Monarchs in an elementary education classroom. **K. Buisman**, Dept of Ecology, Evolution, and Behavior, Univ of Minnesota, St. Paul, MN 55108

- 4:00 PM 158 Insects are SO COOL!-An elementary perspective. **J.N. Greenberg**, Bell Museum of Natural History, Univ of Minnesota, Minneapolis, MN 55455-0104 and K. Michael, Tuttle School, Minneapolis, MN
- 4:25 PM 159 A multidisciplinary education project: Morphine! S.J. Weller, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108; **K.T. Williams**, Bell Museum of Natural History, Minneapolis, MN 55455 and **R.B. Simmons**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108
- 4:45 PM Break
- 5:10 PM 160 The educational value of BUTTERFLIES ALIVE! **S. Borkin**, Milwaukee Public Museum, Milwaukee, WI 53233-1478
- 5:30 PM 161 Concluding remarks. **K.S. Oberhauser**, Dept of Ecology, Evolution, and Behavior, Univ of Minnesota, St. Paul, MN 55108 and S. Weller, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108

**Student-Sponsored Symposium**  
**You mean there's more than doing**  
**research? Improving the *other* skills for**  
**graduate students**

1:50 – 5:15 PM

Presidents

***Organizers and Moderators***

**Jason Harmon**

Department of Entomology  
University of Minnesota  
St. Paul, MN 55108

**Rayda Krell**

Department of Entomology  
Iowa State University  
Ames, IA 50011

**Brian J. Kopper**

Department of Entomology  
University of Wisconsin  
Madison, WI 53706

- 1:50 PM    162 Introduction. **J.P. Harmon**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108
- 2:00 PM    163 Teaching general entomology: some insights and observations. **D.K. Young**, Dept of Entomology, Univ of Wisconsin, Madison, WI 53706
- 2:30 PM    164 “I’m not touching a bug!”: simple tips for effective undergraduate biological lab instruction. **D.C. Houghton**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108
- 3:00 PM    Break
- 3:15 PM    165 Mythology, anecdotes and science. What goes into a good extension talk. **M. Carroll**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108

- 3:45 PM 166 Writing grant proposals: suggestions for graduate students. **G. Heimpel**, 1980 Folwell Ave. 219 Hodson Hall, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108
- 4:15 PM 167 Building the foundation to a prosperous graduate student experience. **C.D. Pilcher**, Monmouth Agronomy Center, Monsanto Company, Monmouth, IL 61462
- 4:45 PM 168 Believe it or not, you're human! A realistic approach to time management. **J.P. Harmon**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108 and R.K. Krell, Dept of Entomology, Iowa State Univ, Ames, IA 50011
- 5:15 PM 169 Concluding remarks. **J.P. Harmon**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108



**Symposium**  
**Management of stored product insects in  
the 21st century: uncertainties and  
challenges, Part 2**

2:00 – 5:00 PM

Faculty

***Organizers***

**Bh. Subramanyam**

Department of Grain Science and Industry  
Kansas State University  
Manhattan, KS 66506

**Phillip K. Harein**

Department of Entomology  
University of Minnesota  
St. Paul, MN 55108

***Moderator***

**Bh. Subramanyam**

Department of Grain Science and Industry  
Kansas State University  
Manhattan, KS 66506

- 2:00 PM    170    Electronic Grain Probe Insect Counter for monitoring insects in grain: present status and future prospects. **N.D. Epsky** and D. Shuman, CMAVE, USDA ARS, Gainesville, FL 32608
- 2:30 PM    171    Recent advances in semiochemical-based management of stored-product insects. **T.W. Phillips**, Entomology and Plant Pathology Dept, Oklahoma State Univ, Stillwater, OK 74078; C. Doud, A. Gebre-Amalak and M. Toews, Entomology and Plant Pathology, Oklahoma State Univ, Stillwater, OK 74078
- 3:00 PM           Break
- 3:15 PM    172    Recent advances in insect resistant packaging. **M.A. Mullen**, GMPRC, USDA ARS, Manhattan, KS 66502

- 3:45 PM 173 Microbial control agents to manage insect pests in stored products. **J.D. Sedlacek**, CRS, Kentucky State Univ, Frankfort, KY 40601; J. Lord, GMPRC, USDA ARS, Manhattan, KS 66502; J. Siegel and P. Vail, HCRL, USDA ARS, Fresno, CA 93727
- 4:15 PM 174 Insect populations before and after heat treatment of mills. **B. Subramanyam**, R. Roesli, D. Eustace and K. Behnke, Dept of Grain Science and Industry, Kansas State Univ, Manhattan, KS 66506
- 4:45 PM 175 Concluding remarks. **B. Subramanyam**, Dept of Grain Science and Industry, Kansas State Univ, Manhattan, KS 66506

**Symposium**  
**Social impacts of mosquito control**

3:05– 5:15 PM  
Alumni

***Organizer and Moderator***

**Joseph F. Sanzone**

Metropolitan Mosquito Control District  
2099 University Avenue  
St. Paul, MN 55104

- 3:05 PM 176 Introduction. **J. Sanzone**, N. Read and S. Manweiler, Metropolitan Mosquito Control District, St. Paul, MN 55104
- 3:15 PM 177 Social and legal impacts of ULV applications for adult mosquito control. **S. Manweiler**, Metropolitan Mosquito Control District, St. Paul, MN 55104; B. Anderson and W. Koskinen, USDA ARS & Dept of Soil, Water & Climate, Univ of Minnesota, St. Paul, MN 55108
- 3:45 PM 178 How many mosquitoes is too many? Setting thresholds for nuisance species. **N. Read**, Metropolitan Mosquito Control District, St. Paul, MN 55104
- 4:15 PM 179 Mosquito control adulticiding - A factual presentation. **W.J. Lechel II**, Saginaw County Mosquito Abatement District, Saginaw, MI 48602
- 4:45 PM 180 The impact of mosquitoes on wildlife: challenging some assumptions. **R.J. Novak**, Illinois Natural History Survey, Champaign, IL 61820
- 5:15 PM 181 Concluding remarks. **J. Sanzone**, N. Read and S. Manweiler, Metropolitan Mosquito Control District, St. Paul, MN 55104

## Submitted 10-Minute Papers

### Sections E and F

2:45 – 5:45 PM

University Ballroom A+B

#### *Moderator*

#### **Gary J. Brewer**

Department of Entomology  
North Dakota State University  
Fargo, ND

- 2:45 PM E 182 Cases of wood-destroying Coleoptera recorded within structures in Minnesota. **J.F. Kyhl**, and S.J. Seybold, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108
- 2:57 PM F 183 Southwestern corn borer control using transgenic field corn. **B.A. Castro**, T.J. Riley and B.R. Leonard, Dept of Entomology, Louisiana State Univ Agricultural Center, Baton Rouge, LA 70803
- 3:09 PM F 184 The effect of two biotypes of European corn borer on sweet corn processing: a processor's perspective. **T.L. Rabaey** and D.J. Bach, The Pillsbury Company, LeSueur, MN 56058
- 3:21 PM F 185 Resistance management for corn rootworms in transgenic insecticidal corn. D. Onstad and **C. Guse**, Univ of Illinois, Champaign, IL 61820
- 3:33 PM F 186 Comparison of two assessment scales for evaluating feeding damage on corn roots by *Diabrotica* spp. larvae. **S.F. Hanser**, Zeneca Ag Products, Richmond, CA 94804; J. Oleson, Dept of Entomology, Iowa State Univ, Ames, IA 50011-3140; K. Ward, Jealott's Hill Research Station, Zeneca Agrochemicals, Bracknell, Berkshire, UK and M. Beccio, Zeneca Ag Products, Richmond, CA 94804
- 3:45 PM Break

- 4:00 PM F 187 Evaluation of semiochemical-based corn rootworm traps for use in adult management programs. **L.D. Chandler**, Red River Valley Agric. Research Center, USDA ARS, Fargo, ND 58105-5674; D. Hartman, Northern Grain Insects Research Lab., USDA ARS, Brookings, SD 57006 and C. Tharp, USDA ARS, Brookings, SD 57006
- 4:12 PM F 188 CO<sub>2</sub>-generating formulations for behavioral control of corn rootworms and termites. **L.B. Bjostad**, E.J. Bernklau and E.A. Fromm, BSPM Dept, Colorado State Univ, Fort Collins, CO 80523
- 4:24 PM F 189 Western corn rootworm larvae can change plants after establishment. **B.E. Hibbard**, USDA ARS, Columbia, MO 65211 and D.P. Duran, Dept of Entomology, Univ of Missouri, Columbia, MO 65211
- 4:36 PM F 190 Impact of different strategies for sunflower stem weevil management in cultivated sunflower. **L.D. Charlet**, Northern Crop Science Laboratory, USDA ARS, Fargo, ND 58105
- 4:48 PM F 191 Spatial distribution of the sunflower midge. **E. Hodgson**, Entomology Dept, North Dakota State Univ, Fargo, ND 58103; I. MacRae, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108 and G. Brewer, Entomology Dept, North Dakota State Univ, Fargo, ND 58103
- 5:00 PM F 192 A biologically based Integrated Pest Management program for Colorado potato beetle, *Leptinotarsa decemlineata*. **C.L. Jorgensen**, Dept of Entomology, North Dakota State Univ, Fargo, ND 58105 and D.L. Olson, Dept of Entomology, North Dakota State Univ, Fargo, ND 58105

- 5:12 PM F 193 Field observations with glandular-haired, potato leafhopper resistant alfalfa. **R.B. Hammond**, Dept of Entomology, OARDC - The Ohio State Univ, Wooster, OH 44691; R. Sulc, Dept of Horticulture and Crop Science, The Ohio State Univ, Columbus, OH 43210 and H. Willson, Dept of Entomology, The Ohio State Univ, Columbus, OH 43210
- 5:24 PM F 194 Evaluation for resistance in durum wheat to the orange wheat blossom midge, *Sitodiplosis mosellana* (Gehin). **K.M. Anderson**, North Dakota State Univ, Fargo, ND 58102; P.A. Glogoza, Dept of Entomology, North Dakota State Univ, Fargo, ND 58105 and M. Weiss, PSES Dept, Univ of Idaho, Moscow, ID 83844-2339
- 5:36 PM F 195 Use of cereal cover crops to enhance insecticidal control of sugarbeet root maggot. **R.J. Dregseth**, M.A. Boetel, A.J. Schroeder, R.B. Carlson, G.J. Brewer, Dept of Entomology, North Dakota State Univ, Fargo, ND 58105 and J.S. Armstrong, Dept of Plant and Soil Science, Texas Tech Univ, Lubbock, TX 79409
- 5:48 PM F 196 Potential use of remote sensing for canopy analysis and pest management decisions. **F.J. Haile**, Dow AgroSciences, Madison, WI 53717 and L.G. Higley, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583

## **Tuesday Evening**

### **Student Recruiting and Employment Mixer**

5:15 – 7:30 PM

Presidents + Regents

Sponsored by NC Entomology Departments:

Iowa State University

University of Illinois

Kansas State University

University of Kentucky

Michigan State University

University of Minnesota

University of Missouri

University of Nebraska

North Dakota State University

Ohio State University

University of Wisconsin

and

Illinois Natural History Survey,

University of Illinois

### **Final Business Meeting**

7:30 – 8:30 PM

University Ballroom A

**Wednesday, March 29, 2000**  
**Morning**

**Continental Breakfast**

6:30 – 8:00 AM

Regents foyer

Sponsored by FMC Corp.

(Guests are welcome)

**Board Certified Entomologists  
Executive Committee Meeting**

6:30 – 8:30 AM

Coffman

**Registration**

8:00– Noon

2<sup>nd</sup> floor lobby

**North Central Branch Executive  
Committee Meeting**

9:00 – 10:30 AM

Coffman

**Refreshment Break**

9:30 – 10:30 AM

Humphrey + Campus

Sponsored by Trécé Inc. and Dow AgroSciences



**Symposium**  
**Site specific IPM**  
7:50 – 12:15 PM  
University Ballroom A+B

***Organizers and Moderators***

**Michael D. Culy**

Dow AgroSciences  
Indianapolis, IN 46268

**Rayda K. Krell**

Department of Entomology  
Iowa State University  
Ames, IA 50011

- 7:50 AM 197 Introduction. **M.D. Culy**, Dow AgroSciences LLC, Indianapolis, IN 46268 and **R.K. Krell**, Dept of Entomology, Iowa State Univ, Ames, IA 50011
- 8:00 AM 198 Within-field spatial dynamics of Colorado potato beetle and its relevance to precision agriculture. **P.E. Blom** and S.J. Fleischer, Dept of Entomology, Pennsylvania State Univ, Univ Park, PA 16802-3508
- 8:30 AM 199 Site specific management of green peach aphids in seed potatoes. **R.A. Suranyi**, I.V. MacRae, D.W. Ragsdale and E.B. Radcliffe , Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108
- 9:00 AM 200 Within field distribution of sugarbeet root maggot and correlation with soil moisture as co-Kreiged by topography. **I.V. MacRae**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108
- 9:30 AM Break
- 9:45 AM 201 Spatial distribution of insect diversity in an agroecosystem. **R.K. Krell** and L.P. Pedigo, Dept of Entomology, Iowa State Univ, Ames, IA 50011
- 10:15 AM 202 Spatial variability of insect pests in soybean, corn, and cotton. **M.M. Ellsburly**, Northern Grain Insects Research Laboratory, USDA ARS, Brookings, SD 57006

- 10:45 AM 203 Entomological aspects of precision farming systems for Colorado irrigated field corn. **F.P. Peairs** and S.W. Walter, Dept of Bioagricultural Sciences and Pest Management, Colorado State Univ, Fort Collins, CO 80523-1177
- 11:15 AM 204 Site-specific agriculture and decision support tools: corn as a model system. **M.D. Culy**, S.P. Nolting and K.D. Schnelle, Dow AgroSciences LLC, Indianapolis, IN 46268
- 11:45 AM 205 Concluding remarks. **M.D. Culy**, Dow AgroSciences LLC, Indianapolis, IN 46268 and R.K. Krell, Dept of Entomology, Iowa State Univ, Ames, IA 50011

**Symposium**  
**Invasive species and biological control**

7:50 – 12:15 PM  
University Ballroom C+D

***Organizers and Moderators***

**George E. Heimpel**  
Department of Entomology  
University of Minnesota  
St. Paul, MN 55108

**Robert N. Wiedenmann**  
Illinois Natural History Survey  
Champaign, IL 61820

- 7:50 AM 206 Introduction. **G.E. Heimpel**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108
- 8:00 AM 207 Applying principles from invasion biology to improve biological control: a new venture with gypsy moth. **R. Venette**, USDA-APHIS & Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108; D.G. McCullough and N. Siegert, Dept of Entomology, Michigan State Univ, East Lansing, MI 48824
- 8:30 AM 208 Invasion of purple loosestrife and its biological control agents in Illinois. **R.N. Wiedenmann**, D.J. Voegtlin and S.L. Post, Illinois Natural History Survey, Champaign, IL 61820
- 9:00 AM 209 Biological control of the North American black pine aphid, *Cinara cronartii* Tissot & Pepper (Homoptera: Aphididae), in South Africa. **Rami Kfir** and N.J. Van Rensburg, ARC-Plant Protection Research Institute, Pretoria, South Africa
- 9:30 AM Break

- 9:45 AM 210 Use of a native weevil to control the exotic aquatic Eurasian watermilfoil. **R.M. Newman**, Fisheries and Wildlife, Univ of Minnesota, St. Paul, MN 55108; D.D. Biesboer, Plant Biology, Univ of Minnesota, St. Paul, MN 55108; D.W. Ragsdale and A. Loos, Entomology, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108
- 10:15 AM 211 Biological control of alfalfa blotch leafminer during its invasion of the upper Midwest. **G.E. Heimpel**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108; F. Meloche, Eastern cereals and oilseeds research center, Ottawa, Canada; T. Davis, Dept of Entomology, Univ of Wisconsin, Madison, WI 53706; R. Venette, USDA ARS & Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108; J.G. Lundgren, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108; D.B. Hogg, Dept of Entomology, Univ of Wisconsin, Madison, WI 53706 and W.D. Hutchison, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108
- 10:45 AM 212 Management strategies for the eucalyptus longhorned borer in California, and implications for Asian longhorned beetle. **L.M. Hanks**, Dept of Entomology, Univ of Illinois, Urbana, IL 61801
- 11:15 AM 213 Invasive species programs in USDA-CSREES. **J.J. Obrycki**, 1400 Independence Ave, USDA-CSREES, Washington, DC 20250-2220
- 11:45 AM 214 The role of predators in the dynamics of gypsy moth populations. **A. Liebhold**, Northeastern Research Station, USDA Forest Service, Morgantown, WV 26505; A. Diss, Wisconsin Dept of Natural Resources, Madison, WI 53707 and K. Raffa, Dept of Entomology, Univ of Wisconsin, Madison, WI 53706
- 12:15 PM 215 Concluding remarks. **G.E. Heimpel**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108

**BCE Symposium**  
**Vision beyond the classroom for graduate  
students to succeed**

7:50 – 12:15 PM

Regents

***Organizer and Moderator***

**Shripat T. Kamble**

Department of Entomology  
University of Nebraska, Lincoln  
Lincoln, NE 68583

- 7:50 AM 216 Introduction: Visionary concept. **S.T. Kamble**, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583-0816
- 8:00 AM 218 Academic perspectives - Current and future challenges of being a professor. **Z.B. Mayo**, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583-0816
- 8:30 AM 219 Industry perspectives - Bottom line is to remain productive. **B.J. Monke**, Bayer Corp., Kansas City, MO 64120-0013
- 9:00 AM 220 USDA perspectives - Teamwork, scientific skills and attitude. **B.E. Hibbard**, USDA ARS, Columbia, MO 65211
- 9:30 AM Break
- 9:45 AM 221 Successful job searches: internationally speaking. **S. Ramaswamy**, Dept of Entomology, Kansas State Univ, Manhattan, KS 66506
- 10:15 AM 222 Workshop - Essential ingredients for success. **D.M. Chambers**, Dow AgroSciences, Indianapolis, IN 46268-1054
- 12:15 PM 223 Concluding remarks. **S.T. Kamble**, Dept of Entomology, Univ of Nebraska, Lincoln, NE 68583-0816

## Submitted 10-Minute Papers

Sections A & D  
8:00 – 10:00 AM  
Alumni

### *Moderator*

**Carl J. Jones**

College of Veterinary Medicine  
University of Illinois  
Urbana, IL

- 8:00 AM    A    224    A survey of the arthropod fauna associated with pocket gopher (*Geomys bursarius*) burrows in Wisconsin. **K. Katovich**, Dept of Entomology, Univ of Wisconsin, Madison, WI 53706
- 8:12 AM    D    225    Suppression of larval *I. scapularis* on white-footed mice (*Peromyscus leucopus*) using host-targeted acaricide application. **M.R. Cortinas**, C. Jones, Dept of Veterinary Pathobiology, College of Veterinary Medicine, Univ of Illinois, Urbana, IL 61802 and G. Maupin, Division of Vector-Borne Infectious Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Fort Collins, CO 80522
- 8:24 AM    D    226    *Wolbachia* infections as an applied tool for modifying natural populations of insects. **E.J. Marsland**, W. Rattanadechakul and S.L. Dobson, The Univ of Kentucky, Lexington, KY 40546
- 8:36 AM    D    227    The effect of horn flies on weight gains of summer-born calves. **J.B. Campbell**, D.J. Boxler and D. Adams, West Central Research & Extension Center, Univ of Nebraska, North Platte, NE 69101
- 8:48 AM    D    228    The effects of stable flies on the weight gains of grazing yearling cattle. **D.J. Boxler**, J.B. Campbell and D. Adams, West Central Research & Extension Center, Univ of Nebraska, North Platte, NE 69101

- 9:00 AM D 229 Parasitic insects associated with stable fly and house fly in Russia and Kazakhstan. **R.D. Moon**, Dept of Entomology, Univ of Minnesota, St. Paul, MN 55108; A. Solodovnikov, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia and V. Kascheev, Zoological Institute, Kazakhstan Academy of Sciences, Almaty, Kazakhstan
- 9:12 AM A 230 The Scarabaeoidea (Coleoptera) of Wisconsin: species inventories, keys, natural histories, and distributions. **N.L. Kriska**, Univ of Wisconsin, Madison, WI 53706
- 9:24 AM A 231 The darkling beetles of Wisconsin (Coleoptera:Tenebrionidae). **J.C. Dunford** and D.K. Young, Univ of Wisconsin, Madison, WI 53706
- 9:36 AM A 232 Distribution of *Cryptocercus* species in the Eastern U.S. **B. Steinmiller**, Dept of Entomology, Kansas State Univ, Manhattan, KS 66506

# PRESENTER INDEX

<b>Presenter .....</b>	<b>Paper/Poster (D) #</b>
Abbott, E. ....	59
Al-Deeb, M.A. ....	D25
Alamalakala, L. ....	D17
Ali, M. ....	115
Alleman, R.J. ....	D51
Alleyne, M. ....	D18
Anderson, K.M. ....	194
Aukema, B.H. ....	109
Barron, J.A. ....	101
Behle, R.W. ....	D138
Berkebile, D.R. ....	D118
Bessin, R. ....	55
Bishop, A.A. ....	D19
Bjostad, L.B. ....	188
Blom, P.E. ....	198
Borkin, S. ....	160
Boughton, A.J. ....	88
Boxler, D.J. ....	228
Braman, K. ....	78
Buisman, K. ....	157
Buschman, L.L. ....	D129
Bystrak, P.G. ....	D128
Campbell, J.B. ....	227
Carroll, M. ....	165
Castro, B.A. ....	183
Catangui, M.A. ....	D121
Cervenka, V.J. ....	2
Chambers, D.M. ....	222
Chandler, L.D. ....	187
Charlet, L.D. ....	190
Chinta, S. ....	D50
Chirhart, J. ....	92
Clark, T.L. ....	D15
Clark, B.P. ....	D23
Clark, P.L. ....	D131
Cloyd, R. ....	76
Cortinas, M.R. ....	225
Coudron, T.A. ....	D31
Culy, M.D. ....	197, 204, 205
Daves, C.A. ....	D141
Davis, T.J. ....	114
Delaney, K.J. ....	D52
DeVries, T.A. ....	D139
DiFonzo, C.D. ....	D147, D149
Dregseth, R.J. ....	195
Dunford, J.C. ....	231
Eliason, E. ....	77
Ellis, J.A. ....	106



Ellis, M.D. ....	116
Ellsbury, M.M. ....	202
Epsky, N.D. ....	170
Erbilgin, N. ....	107
Evans, E.C. ....	81
Fassbinder, C.A. ....	D20
Ferreira Vilela, E. ....	D46
Ferrington, Jr., L.C. ....	89, 97
Flora, G. ....	57
Fox, C.W. ....	110
Funderburk, L. ....	156
Ginzel, M.D. ....	108
Greenberg, J.N. ....	12, 158
Grier, C.A. ....	D34
Griffin, M. ....	111
Gross, K.M. ....	D120
Guse, C. ....	185
Haile, F.J. ....	196
Hammack, L. ....	D140
Hammond, R.B. ....	193
Hanks, L.M. ....	75, 212
Hanser, S.F. ....	186
Harmon, J.P. ....	162, 168, 169
Harvey, T.L. ....	D145
Hawkins-Bowman, A.K. ....	D38
Heimpel, G.E. ....	166, 206, 211, 215
Hein, G.L. ....	D146
Helgen, J. ....	91
Hellenthal, R.A. ....	3
Herms, D.A. ....	72
Hibbard, B.E. ....	189, 220
Hilgarth, R. ....	D30
Hoback, W.W. ....	112
Hodgson, E. ....	191
Horn, D.J. ....	7, 14
Houghton, D.C. ....	164
Huang, F. ....	D133
Hunt, T.E. ....	D144
Jarnefeld, J.L. ....	66
Johnson, D. ....	D124
Jones, C.J. ....	68
Jorgensen, C.L. ....	192
Kamble, S.T. ....	216, 217, 223
Katovich, S.A. ....	5
Katovich, K. ....	224
Keaster, A.J. ....	D122, D123
Kelly, K. ....	D21
Kfir, Rami ....	209
Kopper, B.J. ....	84
Kramer, K.J. ....	103
Krell, R.K. ....	201

Krischik, V. ....	70, 73, 79
Kriska, N.L. ....	230
Kuha, S.C. ....	D22
Kurtti, T.J. ....	62, 69
Kyhl, J.F. ....	182
Lechel II, W.J. ....	180
Lee, K.E. ....	93
Levine, E. ....	D39
Liebhold, A. ....	214
Lindsay, L.R. ....	64
Lundgren, J. ....	85
Mabry, T.R. ....	D142
Macedo, P.A. ....	82
Mackay, M.S. ....	D150
MacRae, I.V. ....	200
Manweiler, S. ....	177
Margolies, D.C. ....	D45
Marsland, E.J. ....	226
Mason, L.J. ....	105
Matten, S. ....	56
Mayo, Z.B. ....	218
Menon, A. ....	D41
Mesce, K.A. ....	D35
Metzler, E.H. ....	13
Milbrath, L.R. ....	D43
Miller, W. ....	1, 6
Miller, F. ....	71
Mills, D.L. ....	D143
Monke, B.J. ....	219
Moon, R.D. ....	229
Morgan, R.C. ....	11
Mullen, M.A. ....	172
Mundal, D.A. ....	D48
Myers, S.W. ....	D119
Nearman, J. ....	D33
Neitzel, D.F. ....	65
Newman, R.R. ....	D127
Newman, R.M. ....	210
Novak, R.J. ....	179
Nowatzki, T.M. ....	87
Oberhauser, K.S. ....	153, 154, 161
Obrycki, J.J. ....	213
Opit, G. ....	D49
Osier, T.L. ....	83
Oyediran, I.O. ....	D125
Parimi, S. ....	D16
Peairs, F.P. ....	203
Pearson, G.A. ....	9
Perez-Mendoza, J. ....	102
Perry, J.A. ....	94
Peters, M.L. ....	D136

Peterson, C. ....	D28
Phillips, T.W. ....	171
Pilcher, C.D. ....	167
Pitman, S. ....	60
Powell, J.S. ....	D40
Prabhakaran, S. ....	104
Pryby, M. ....	155
Rabaey, T.L. ....	184
Ramaswamy, S. ....	221
Ratcliffe, R.H. ....	8
Ravyn, M.D. ....	67
Raymond, C.B. ....	D42
Read, N. ....	95, 178
Reagel, P.F. ....	113
Reimers-Hild, C. ....	D134
Rice, M.E. ....	D130, D132
Richardson, B. ....	100
Roehrdanz, R.L. ....	D27
Rogers, M.E. ....	D44
Rule, D. ....	86
Sadof, C.S. ....	74
Sagel, A. ....	D117
Sanzone, J. ....	176, 181
Sargent, J.E. ....	99
Scharf, M.E. ....	D29
Sedlacek, J.D. ....	10, 173
Sheppard, C.A. ....	4
Siegfried, B.D. ....	D32
Simmons, R.B. ....	159
Smith, C.M. ....	53, 61
Sommers, D. ....	54
Spangler, S. ....	D135
Spencer, J.L. ....	D36
St. Pierre, M.J. ....	D37
Steevens, D. ....	58
Steinmiller, B. ....	232
Stewart, P.M. ....	90
Stewart Jr., R.L. ....	D47
Subramanyam, B. ....	98, D152, 174, 175
Suranyi, R.A. ....	D148, 199
Thomas, J.A. ....	D24
Troelstrup, Jr., N.H. ....	96
Venette, R. ....	207
Vilella, F.M.F. ....	D126
Walker, E.D. ....	63
Wamsley, C.S. ....	D26
Weiser, L.A. ....	D151
Wiedenmann, R.N. ....	208
Wilson, T.A. ....	D137
Young, D.K. ....	163
Zoerb, A.C. ....	80

# TAXONOMIC INDEX

<b>Taxon</b> .....	<b>Paper/Poster (D) #</b>
Acari .....	D24, D45, D49, 63, 65, 68, 74
Acariformes .....	225
Acarina .....	115, D145
<i>Aceria tosichella</i> .....	D24, D145
Acrididae .....	D143
<i>Aedes aegypti</i> .....	D34
<i>Aedes albopictus</i> .....	226
<i>Aedes</i> spp. ....	176, 177, 178, 179, 180, 181
<i>Agromyza frontella</i> .....	114, 211
Agromyzidae .....	114, 211
<i>Agrotis ipsilon</i> (Hufnagle) .....	88, D128
<i>Ahasverus advena</i> .....	174
<i>Aleochara</i> spp. ....	229
<i>Aloosphila pometaria</i> .....	71
<i>Anisopteromalus calandrae</i> .....	D41
Anobiidae .....	98, 175
<i>Anopheles</i> spp. ....	176, 177, 178, 179, 180, 181
<i>Anoplophora glabripennis</i> .....	212
Anthocoridae .....	D25, D42
Anthomyiidae .....	D38
Aphididae .....	D146, D148, 199, 209
<i>Aphthona</i> spp. ....	D48
Apidae .....	D20, D50, 81, 82, 115, 116
<i>Apis mellifera</i> .....	D20, D50, 81, 82, 115, 116
Araneae .....	D52
<i>Argia apicalis</i> .....	D47
Baetidae .....	93
<i>Blattella germanica</i> .....	D28
Blattellidae .....	D28
Blattodea .....	232
<i>Bombus impatiens</i> .....	81
Bostrichidae .....	D152
Braconidae .....	D18
Bruchidae .....	110
Calliphoridae .....	D17, D21, D117, D118
<i>Callirhytis cornigera</i> .....	77
<i>Calomycterus setarius</i> .....	D144
<i>Campoletis sonorensis</i> .....	D30
Cecidomyiidae .....	191, 194
Cerambycidae .....	108, 212
<i>Cerotoma trifurcata</i> (Forster) .....	D16, 202
Chelicerata .....	D27
<i>Chrysochus auratus</i> .....	D37
Chrysomelidae .....	D15, D16, D26, D29, D36,
.....	D37, D39, D48, 71, 86, 87, D135, D136,
.....	D137, D138, D139, D140, D141, D142,
.....	185, 186, 187, 188, 189, 192, 198, 202, 208

Chrysomeliodae .....	112
Cicadellidae .....	D150, D151, 193
<i>Cinara cronartii</i> .....	209
Cleridae .....	107
Coccinellidae .....	111
<i>Cochliomyia hominivorax</i> .....	D17, D117, D118
Coenagrionidae .....	D47
<i>Coleomegilla maculata</i> .....	111
Coleoptera .....	D15, D16, D19, D26, D29, D36, D37,
.....	D39, D43, D44, D48, 71, 86, 87, 98, 103, 107,
.....	108, 109, 110, 111, 112, D135, D136, D137, D138,
.....	D139, D140, D141, D142, D144, D152, 170, 174,
.....	175, 182, 185, 186, 187, 188, 189, 190, 192, 198,
.....	201, 202, 208, 210, 212, 224, 229, 230, 231
<i>Contarinia schulzi</i> Gagné .....	191
<i>Coquillettia</i> spp. ....	176, 177, 178, 179, 180, 181
<i>Corticeus parallelus</i> .....	107
<i>Cotesia chilonis</i> .....	D18
<i>Cotesia flavipes</i> .....	D18
<i>Cotesia sesamiae</i> .....	D18
Crambidae .....	D32, 80, D121, D130, D132, D133, 203
Crustacea .....	D27
Cryptoceridae .....	232
<i>Cryptocercus darwini</i> .....	232
<i>Cryptocercus garciai</i> .....	232
<i>Cryptocercus wrighti</i> .....	232
<i>Cryptolestes ferrugineus</i> .....	174
<i>Cryptolestes</i> spp. ....	170
Cucujidae .....	98, D152, 174
Cucujidae .....	170
<i>Culex</i> spp. ....	176, 177, 178, 179, 180, 181
Culicidae .....	D34, 176, 177, 178, 179, 180, 181, 226
<i>Culiseta</i> spp. ....	176, 177, 178, 179, 180, 181
Curculionidae .....	D43, 98, 103, D144,
.....	D152, 175, 182, 190, 210
<i>Cyclocephala</i> spp. ....	D44
<i>Cylindrocopturus adspersus</i> .....	190
Cynipidae .....	77
Danaidae .....	D33, D131
<i>Danaus plexippus</i> .....	D33, D131, 154, 155, 156, 157, 161
<i>Dasychira pinicola</i> .....	D40
<i>Delia radicum</i> .....	D38
<i>Diabrotica balteata</i> LeConte .....	112
<i>Diabrotica barberi</i> .....	87, D140, 187, 202
<i>Diabrotica</i> spp. ....	D15, D135, D137, 186
<i>Diabrotica undecimpunctata undecimpunctata</i> Mannerheim	
.....	112
<i>Diabrotica virgifera</i> .....	D138, D139, 188
<i>Diabrotica virgifera virgifera</i> LeConte .....	D26, D29, D36,
.....	D39, 86, 87, 112, D136, D140,
.....	D142, 185, 187, 189, D141

<i>Diaphnocoris chlorionis</i> .....	74
<i>Diatraea grandiosella</i> Dyar .....	D18, D124, D128, 183
<i>Diatraea saccharalis</i> (Fabricius) .....	D18, D128
Diptera .....	D17, D21, D22, D23, D34, D38,
.....	93, 114, D117, D118, 176, 177, 178, 179, 180,
.....	181, 191, 194, 195, 200, 211, 226, 227, 228, 229
Ehrlichiaecae .....	67
<i>Elasmopalpus lignosellus</i> .....	D126
<i>Empoasca fabae</i> (Harris) .....	D150, D151, 193
Ephemeroptera .....	93
Eriophyidae .....	D24, D145
<i>Euhrychiopsis lecontei</i> .....	210
<i>Fenusa ulmi</i> .....	71
<i>Galerucella calmariensis</i> .....	208
<i>Geocoris punctipes</i> .....	D42
Gracillariidae .....	84
<i>Haematobia irritans</i> (L) .....	227
<i>Helicoverpa zea</i> Boddie .....	D128
Hemiptera .....	D25, D148, D150, 199, 201
Heteroptera .....	D31, D42, 78, 202
<i>Hexarthrum ulkei</i> .....	182
Histeridae .....	107
<i>Homadaula anisocentra</i> .....	74
Homoptera .....	D51, 74, 76, D146, D151, 193, 201
Hydropsychidae .....	93
Hymenoptera .....	D18, D20, D30, D41, D44, D50, 71,
.....	77, 81, 81, 82, 85, 113, 115, 116, 229, 229
Ichneumonidae .....	D30
Insecta .....	D27
<i>Ips grandicollis</i> .....	107
<i>Ips pini</i> .....	107, 109
<i>Ixodes scapularis</i> .....	63, 65, 68, 225
Ixodidae .....	63, 65, 68, 225
Laemophilidae .....	174
<i>Lasioderma aerricorne</i> .....	174
Lepidoptera .....	D18, D32, D33, D35, D40, D46, 74, 80,
.....	83, 84, 85, 88, 98, 103, 106, D119, D120,
.....	D121, D122, D123, D124, D125, D126,
.....	D127, D128, D130, D131, D132, D133,
.....	D152, 154, 155, 156, 157, 159, 160,
.....	161, 174, 175, 183, 184, 201, 203, 207, 214
<i>Leptinotarsa decemlineata</i> .....	198, 192
<i>Leucoptera coffeella</i> .....	D46
Lucanidae .....	230
Lycosidae .....	D52
Lyctidae .....	182
<i>Lyctus planicollis</i> .....	182
Lygaeidae .....	D42
<i>Lygus hesperus</i> .....	202
<i>Lymantria dispar</i> .....	D40, 83, 214
<i>Lymantria monacha</i> .....	D40

Lymantriidae .....	D40, 83, 207, 214
<i>Lymatria dispar</i> .....	207
<i>Manduca sexta</i> .....	D35
<i>Melanoplus femurrubrum</i> .....	D143
Miridae .....	74, 202
<i>Musca domestica</i> .....	D22, D23
<i>Musca</i> spp. ....	229
Muscidae .....	D22, D23, 227, 228, 229
<i>Muscidifurax</i> spp. ....	229
Myriapoda .....	D27
<i>Myzus persicae</i> .....	D148, 199
Nabidae .....	D42
<i>Nabis roseipennis</i> .....	D42
<i>Nicagus obscurus</i> LeConte .....	230
<i>Nicrophorus marginatus</i> .....	D19
Noctuidae .....	88, D127, D128
Nymphalidae .....	154, 155, 156, 157, 161
Odonata .....	D47
<i>Orgyia antiqua</i> .....	D40
<i>Orgyia leucostigma</i> .....	D40
<i>Orgyia pseudotsugata</i> .....	D40
<i>Orius insidiosus</i> .....	D42, D25
Orthoptera .....	D28, D143
<i>Oryzaephilus</i> spp. ....	170
<i>Oryzaephilus surinamensis</i> .....	D152
<i>Ostrinia nubilalis</i> (Hübner) .....	D18, D32, 80, D119,
.....	D120, D121, D122, D123, D125,
.....	D128, D130, D132, D133, 184, 203
Otitidae .....	195, 200
<i>Paeactrita vernata</i> .....	71
<i>Papaipema nebris</i> .....	D127
<i>Pemphigus betae</i> .....	D146
Pentatomidae .....	D31
<i>Phormia regina</i> .....	D21
<i>Phyllonorycter tremuloidiella</i> .....	84
Phytoseidae .....	D45
<i>Phytoseiulus persimilis</i> .....	D45
Pieridae .....	85
<i>Pieris rapae</i> .....	85
<i>Planococcus citri</i> .....	76
<i>Platysoma cylindrica</i> .....	107
<i>Platytechranychus mitidigitalis</i> .....	74
<i>Plodia interpunctella</i> .....	98, D152, 175
Plutellidae .....	74
<i>Podisus maculiventris</i> .....	D31
<i>Popillia japonica</i> .....	71
Psuedococcidae .....	76
Psychidae .....	106
Pteromalidae .....	D41, 229
<i>Pyrhaulta luteola</i> .....	71

Pyralidae .....	D18, D46, D119, D120, D122, D123, ..... D124, D125, D126, D128, D152, 174, 183, 184
Rhabdita .....	D23
<i>Rhinocyllus conicus</i> .....	D43
<i>Rhyzoperta dominida</i> .....	D152
Scarabaeidae .....	D44, 71, 224
<i>Schizocosa ocreata</i> .....	D52
<i>Schizocosa rovneri</i> .....	D52
Scolytidae .....	107, 109
Silphidae .....	D19
Silvanidae .....	98, D152, 174, 175
<i>Sitodiplosis mosellana</i> .....	194
<i>Sitophilus oryzae</i> .....	98, D152, 175
<i>Sitophilus</i> spp. ....	103
<i>Spalangia</i> spp. ....	229
Sphingidae .....	D35
<i>Spodoptera frugiperda</i> J.E.Smith .....	D128
Staphylinidae .....	229
<i>Stator limbatus</i> .....	110
<i>Steinernema feltiae</i> .....	D23
Steinernematidae .....	D23
<i>Stephanitis pyrioides</i> (Scott) .....	78
<i>Stomoxys Calcitrans</i> (L) .....	228
<i>Stomoxys</i> spp. ....	229
Tenebrionidae .....	98, 107, D152, 170, 174, 175, 231
<i>Tetanops myopaeformis</i> .....	195, 200
Tetranychidae .....	D49, 74
<i>Tetranychus urticae</i> .....	D49
<i>Thanasimus dubius</i> .....	107
<i>Thyridopteryx ephemeraeformis</i> .....	106
Tingidae .....	78
<i>Tiphia pygidialis</i> .....	D44
Tiphiidae .....	D44
<i>Tribolium</i> spp. ....	170
<i>Tribolium castaneum</i> .....	98, D152, 174, 175
<i>Trichogramma brassicae</i> .....	85
Trichogrammatidae .....	85
Trichoptera .....	93
<i>Trichosirocalus horridus</i> .....	D43
<i>Varroa jacobsoni</i> .....	115
Varroidae .....	115
<i>Zea mais</i> .....	103



# KEY WORD INDEX

Keyword/Common Name .....	Paper/Poster (D) #
1890/1862 .....	10
abundance .....	D22
academics .....	218
acaricide .....	68, 225
adjuvant .....	D138
<i>Aedes albopictus</i> .....	226
agricultural watersheds .....	94
alfalfa .....	D51, D151, 193
alfalfa blotch leafminer .....	211
American elm .....	71
Anthomyiidae .....	D38
anti-bacterial .....	D19
aquatic .....	3
areawide management .....	87
aspen blotch leafminer .....	84
assessment .....	96
aster leafhopper .....	D51
azalea lace bug .....	78
<i>Bacillus thuringiensis</i> .....	D32, D127, D133
bean leaf beetle .....	D16
bedding plants .....	D49
behavior .....	D36, D45, D142
behavioral sequences .....	D52
beneficial predator .....	D31
benthic macroinvertebrates .....	94
<i>Beta vulgaris</i> .....	195
bioassay .....	D33, D118
biocontrol .....	76, 77, 106
biological control .....	D43, D44, D48, 75, 113, 206, 207, 208, 209, 210, 211, 212, 215
biopesticide .....	103
Biotechnology .....	D134
bivoltine .....	184
black cutworm .....	88
black pine aphid .....	209
blowfly .....	D21
<i>Bt</i> .....	D33, D122
<i>Bt</i> corn .....	D121, D123, D130, D132, 173
<i>Bt</i> hybrid maize .....	D125
<i>Bt</i> maize .....	D131
burrows .....	224
bursicon .....	D35
burying beetle .....	D19
butterflies .....	160
cabbage root maggot .....	D38
calf weights .....	227
canopy Size .....	196
career opportunities .....	167

catnip .....	D28
Cerambycidae .....	212
chemical control .....	190
chemical defense .....	72
citizen science .....	155
classical biological control .....	229
classroom .....	12
CO <sub>2</sub> .....	84
cockroaches .....	232
coleopteran predators .....	107
collaboration .....	10
competition .....	81
competitive grants .....	213
conservation .....	113, 154, 161, 210
control .....	D34, 115, 176, 177, 179, 180, 181
corn .....	103, D122, D135, D137
corn borer .....	D121
corn rootworm .....	D29, D135, D136, D139, 186
corn rootworm emergence .....	87
cover crop .....	195
crop consultants .....	D141
crop rotation .....	D36, D39
Crylf .....	D128
Cryptocercus .....	232
cucurbatacin .....	D138
cultural control .....	72, 112
cultural practices .....	D124
<i>Cyclocephala</i> spp. ....	D44
cytochrome P450 .....	D29
cytoplasmic incompatibility .....	226
damsselfy .....	D47
Decision Support Systems .....	197, 204, 205
defoliation .....	D143
degree days .....	D120
detection .....	82
development .....	D34
<i>Diabrotica</i> .....	D15
<i>Diabrotica virgifera virgifera</i> LeConte .....	86
diet .....	D142
dispersal .....	D37
display .....	11
distribution .....	D38
diversity .....	201
drowning .....	112
durum wheat .....	194
ecdysis behavior .....	D35
ecological interactions .....	75
economic entomology .....	4
economic threshold .....	116
education .....	12, 154, 156, 157, 158, 160, 161, 218
educational module .....	D134

egg production .....	D117
egg size .....	110
<i>Elasmopalpus lignosellus</i> .....	D126
electroantennogram .....	D50
electronic monitoring .....	170
emergence .....	D120
entomology .....	163
entomopathogenic nematodes .....	D23
enzyme .....	D19
Ephemeroptera .....	93
European corn borer .....	D119, D133, 203
evolution .....	110
exhibit .....	160
extension .....	165
fecundity .....	D31
feeding breadth .....	D40
female-female interactions .....	D21
field corn .....	183
filth fly parasites .....	229
fitness .....	D133
Food and Drug Administration .....	101
food protection .....	172
Food Quality Protection Act (FQPA) .....	D147, D149
food safety .....	101
foreign exploration .....	229
forest type .....	214
fragmentation .....	D37
fumigation .....	104
functional response .....	D41
funding .....	213
gene rearrangements .....	D27
genetic variation .....	D16
<i>Geocoris punctipes</i> .....	D42
geostatistics .....	198
GIS .....	191, 200
glandular-haired alfalfa .....	D150
Global Positioning Systems .....	198
GMO .....	D124
graduate school .....	167
graduate student .....	166, 217
grant proposals .....	166
grasshopper .....	D143
grazing yearlings .....	228
green peach aphid .....	D148, 199
gypsy moth .....	207
high temperatures .....	174
historical .....	4
history .....	2, 3
honey bee .....	D20, 82, 115, 116
honey locust .....	74
horn flies .....	227

horned oak gall .....	77
host density .....	D41
host establishment .....	189
host plant resistance .....	D49, 71, 190, 193, 194
host suitability .....	85
host-parasitoid relationship .....	D18
host-plant .....	D37
host-targetted .....	225
house fly .....	D22, D23
human granulocytic ehrlichiosis .....	67
husbandry .....	11
hygienic behavior .....	D50
Ichnovirus .....	D30
immune response .....	D18
<i>in vitro</i> rearing .....	D31
indirect competition .....	D43
Informal science education .....	159
Insecta .....	174
Insectarium .....	11
insecticide resistance .....	D29
insecticides .....	D25
integrated control .....	195
invasion .....	207, 211
invasion biology .....	206, 215
invasive species .....	206, 212, 213, 215
invertebrate community composition .....	93
IPM .....	D46, 98, D126, 175
<i>Ips pini</i> .....	109
IR-4 .....	D149
<i>Itoplectis conquistator</i> .....	106
kairomone .....	D26
keystone .....	D47
laboratory selection .....	D32
lake .....	96
landscape ecology .....	74
landscape IPM .....	77, 78
larvae .....	155
larval movement .....	189
leafy spurge .....	D48
Lepidoptera .....	D46
<i>Leucoptera coffeella</i> .....	D46
long PCR .....	D27
longhorned beetles .....	108
LT <sub>50</sub> .....	112
Lugger .....	2
lure .....	D26
Lyme disease .....	63, 65, 225
<i>Lythrum salicaria</i> .....	208
maize .....	D128
management .....	D148, D152
management thresholds .....	187

management zones .....	202
microbial control .....	173
minor crops .....	D149
mites .....	D20
mitochondrial DNA .....	232
modelling .....	87
molecular markers .....	D17
monarch butterfly .....	D131
monitoring .....	155
monoterpenoids .....	D20
Morrill Acts .....	10
mortality .....	D117
mosquito .....	D34, 176, 177, 178, 179, 180, 181
movement .....	D39
mtDNA .....	D27
Museums .....	159
<i>Nabis roseipennis</i> .....	D42
narrow row corn .....	D139
native bees .....	81
natural enemy .....	214
natural selection .....	110
Near- infrared (NIR) .....	102
neuropeptides .....	D35
new technologies .....	98, 175
newsletter .....	D148
northern corn rootworm .....	D140, 187
nucleopolyhedrovirus .....	88
O <sub>3</sub> .....	84
<i>Odocoileus virginianus</i> .....	67
<i>Orius</i> spp. ....	D25
<i>Orius insidiosus</i> .....	D42
ornamental plants .....	75
osage orange .....	D28
<i>Ostrinia nubilalis</i> .....	D119, D125
outreach .....	154, 161
ovarian development .....	D117
oviposition .....	D21, 111
packaging .....	172
parasitism .....	106, 114
parasitoid .....	78, 76, 108
PCR-RFLP .....	D16
<i>Peromyscus leucopus</i> .....	67
personal development .....	167
perspectives .....	163
pest management .....	86, D124
pest management decision .....	196
pest outbreak .....	74
pesticide .....	176, 177, 180, 181
pesticide use .....	D147
pheromones .....	171
phylogeny .....	D15

Phytoplasma .....	D51
<i>Pieris rapae</i> .....	85
pine engraver beetles .....	107
plant architecture .....	76
plant protection .....	D126
planting date .....	190
<i>Platytomus notialis</i> (Cartwright) .....	230
pocket gopher .....	224
pollen .....	D130, D131
population dynamics .....	68, 198
population wave .....	114
potato leafhopper .....	D150, D151, 193
powderpost beetles .....	182
prairie .....	113
precision agriculture .....	197, 201, 204, 205
precision farming .....	203
predation .....	109, 114
predator .....	D47, 111, 214
predator-prey dynamics .....	D45
pre-mating interactions .....	D52
primary screwworm .....	D17
<i>Psilocnemis leucosticta</i> Burmeister .....	230
public schools .....	158
pupal mortality .....	200
purple loosestrife .....	208
rainfastness .....	D138
RAPD .....	D17
red pine mortality .....	107
reduced-risk pesticide .....	D152
remote sensing .....	196
repeat element gene family .....	D30
repellent .....	D28, 171
reproductive success .....	81
resistance .....	D32
resistance management .....	D132, 185, 189
risk assessment .....	65
rootworm .....	D15, D137, 185, 188
sampling .....	D140, 170
SDS-PAGE .....	D18
sealing techniques .....	104
seed potato .....	199
Sensilla .....	D50
site specific IPM .....	200
site specific management .....	199, 202
site-specific agriculture .....	197, 204, 205
skills .....	217
soil fertility .....	72
soil insecticide efficacy .....	D139
South Africa .....	209
South Dakota .....	D121
southwestern corn borer .....	183

soybean .....	D36, 86, D143, 201
soybean injury .....	D144
spatial variability .....	202
spider mites .....	D49
stable fly .....	228
stalk borer .....	D127
statistical analysis .....	186
Steinernema .....	D23
stored grain .....	98, D152, 175
stored product insects .....	101, 102, 170
stored product moths/beetles .....	173
stored-products .....	172
stream ecology .....	94
strip harvesting .....	D151
student research .....	156
sugar beet root aphid .....	D146
sulfury fluoride .....	104
sunflower midge .....	191
survey .....	D132, D141, 224, 231
teaching .....	9, 12, 163
temperature .....	D41
Tenebrionidae .....	231
termite .....	188
terpenes .....	D40
<i>Thanasimus dubius</i> .....	109
threshold .....	178
ticks .....	63
<i>Tiphia pygidialis</i> .....	D44
tolerance .....	178
training .....	217, 218
transgenic .....	103, D127, D128, D134, D135, D137, 185
transgenic maize .....	D136
trapping .....	D22
traps .....	171, 174
<i>Trichogramma brassicae</i> .....	85
<i>Triticum aestivum</i> .....	D24
tritrophic .....	D45
undergraduate research .....	9
univoltine .....	D120, 184
urbanization .....	93
USDA ARS employment .....	220
varietal resistance .....	D146
<i>Varroa</i> .....	82, 115, 116
velvetleaf .....	111
virus transmission .....	D24
water quality .....	96
weather .....	68
weeds .....	210
weight gains .....	228
western bean cutworm .....	203
western corn rootworm .....	D26, D39, D136, D140, D141, 187

wheat .....	D145
wheat curl mite .....	D145
wheat midge .....	194
wildlife .....	179
wind movement .....	D24
wind tunnel .....	D142
Wisconsin .....	231
Wolbachia .....	226
wolf spiders .....	D52
wood-destroying .....	182
yield .....	D122, D123, D145
yield response .....	D146



# Blank Schedules

**Monday, March 27, 2000**

7:00

8:00

9:00

10:00

11:00

12:00

1:00

2:00

3:00

4:00

5:00

6:00

7:00

8:00

9:00

**Tuesday, March 28, 2000**

7:00

8:00

9:00

10:00

11:00

12:00

1:00

2:00

3:00

4:00

5:00

6:00

7:00

8:00

9:00

**Wednesday, March 29, 2000**

7:00

8:00

9:00

10:00

11:00

12:00

1:00

2:00

3:00

4:00

5:00

6:00

7:00

8:00

9:00