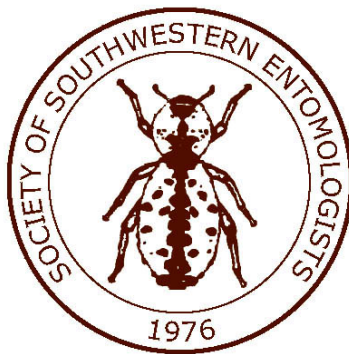


53rd ANNUAL MEETING
of the
SOUTHWESTERN BRANCH of the
ENTOMOLOGICAL SOCIETY OF AMERICA



and the
ANNUAL MEETING of the
SOCIETY OF SOUTHWESTERN ENTOMOLOGISTS



28 FEBRUARY – 3 MARCH 2005

Wyndham Hotel (Airport)
2910 Yale Blvd SE
Albuquerque, New Mexico
(505)-843-7000

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SPONSORS

We thank the following people and organizations for their generous donations in support of the SWB-ESA meeting:

Bayer Crop Science	Syngenta	U.A.P. Southwest
DuPont Crop Protection	Monsanto	FMC Corporation
Dr. Ann Weise	Trece, Inc.	
Entomology Consultants (Matt Lee)	Agrilience (Lupe Carrasco)	Bayer Crop Sciences (Julie Dingus)

MEETING INFORMATION

REGISTRATION:

All persons attending the meetings or participating in the program must register. On-site registration fees for the SWB-ESA meeting are:

	<u>Full meeting*</u>	<u>One day only*</u>
Active ESA member	\$125	\$30
Student ESA member	40	10
Non-member	140	40
Youth member	10	10
Spouse/Guest	35	35
Honorary/Emeritus	No charge, but we request that you register, please.	

*The full-meeting fee includes admission to all functions, including the banquet. The one-day fee **does not** include the banquet.

ESA CERTIFICATION BOARD INFORMATION:

Information regarding the Certification Board of ESA is available at the Registration Desk.

SPONSORS:

We thank our sponsors for their generous support of activities such as the Insect Expo, student mixer, Linnaean Games, continental breakfast and breaks, spouse/guest and retiree functions.

AUDIOVISUAL:

ONLY digital projectors with computers will be provided for oral presentations. If you uploaded your presentation through the SWBESA Web Site, you should confirm that it has been loaded into the correct time slot for presentation. If you did not upload your presentation, bring your Power Point files on CD or "jump drive" to the Presentation Preview-Presentation Collection Desk **one day before** your scheduled presentation.

PROGRAM SCHEDULE AND MODERATORS:

Speakers are limited to the time indicated in the schedule. Moderators have the responsibility and authority to enforce the time limits indicated in the schedule. **Timers and laser pointers** will be available to Moderators before their sessions begin; go to the Presentation Preview- Presentation Collection Desk in Foyer B. Please return timers and laser pointers promptly to this desk when your session concludes.

RETIREE AND SPOUSE/GUEST HOSPITALITY:

Retiree and spouse/guest information is available at the Registration Desk. On both March 1 and 2 a continental brunch will be available from 9-11AM in the Vista Norte Room. We will plan our daily activities at that time. These activities will include a trip to the museum and Old Town on March 1 and a tram ride up the mountain for lunch on March 2. The brunch is sponsored by Dr. Ann Wiese and Bayer CropSciences. Each individual is responsible for their own costs associated with the other activities.

JOB OPPORTUNITY AREA:

The Student Affairs Committee of the SWB-ESA has a list of Job Opportunities in the Valle Grande room during the meetings. Employers should provide copies of available opportunities to post. Potential employees/students should bring multiple copies of resumes to leave during the meeting. Volunteers operating the Opportunity Area will serve as liaisons to arrange interviews if needed.

LOST AND FOUND:

Articles should be turned in or reported to the Registration Desk or hotel main desk.

MESSAGES:

A message board is at the Registration Desk.

BANQUET:

The banquet will be in Bandelier & Tijeras rooms. **Extra tickets** may be purchased for **\$25** at the Registration Desk.

BANQUET MENU:

Crisp Romaine with Cherry Tomatoes, Jicama, Julienne Carrots with Raspberry Vinaigrette or Ranch Dressing

Honey Mustard Chicken Breast, London Broil Apricot Nectar
(Vegetarian Entrée is a Special Order)

Fresh Vegetables, Rice, Bread & Butter Service

Mexican Chocolate Mousse, Cinnamon & Whipped Cream

Iced Tea

Coffee, Decaffeinated Coffee & Selection of Herbal Teas

PROGRAM SUMMARY

SUNDAY, FEBRUARY 27, 2005

Southwestern Branch-ESA Executive Board Meeting 3:00PM – 5:00PM
Location: Bernalillo

MONDAY, FEBRUARY 28, 2005

MEETINGS and ACTIVITIES

Southwestern Branch-ESA Registration
Location: Foyer B 3:00PM – 7:00PM

Society for Southwestern Entomologists

Executive Committee Meeting
Location: Valle Grande 3:30PM – 4:00PM

General Membership Business Meeting
Location: Valle Grande 4:00PM – 5:00PM

Student Mixer
Location: Tijeras Room 7:00PM – ????PM

TUESDAY, MARCH 1, 2005

Registration for SWBESA meeting Location: Foyer B	7:00AM – 6:30PM
Poster Set Up---NOTE: All Student Posters and All Regular Member Posters will be on display Tuesday AND Wednesday Location: Valle Grande	7:00AM – 8:00AM
Poster Viewing and Job Opportunity Area Location: Valle Grande	8:00AM – 5:00PM
Presentation Preview- Presentation Collection Area Location: Foyer B	8:00AM – 5:00PM
Plenary Session Location: Chaco	8:00AM – 10:00AM
MANDATORY MEETING: ALL CHAIRS OF ALL SWBESA COMMITTEES Location: Chaco 11:00AM – noon	
LUNCH---on your own	11:00AM – 1:00PM
Student Competition---Oral Presentations Location: Chaco	1:00PM – 2:12PM
SYMPOSIUM: Urban Entomology, Scott Ludwig, Moderator Location: Chaco	2:40PM – 4:12PM
SYMPOSIUM: Bugs in our Crops, Scott Bundy, Moderator Location: Bandelier	2:40PM – 4:12PM
Linnaean Games-Preliminary Rounds – Phil Mulder, Moderator Location: Chaco	5:00PM – 6:30PM
Banquet and Awards Program Location: Bandelier & Tijeras	
Social Time, Cash Bar	6:30PM – 7:00PM
Dinner, ESA Presidential Address and Awards Program	7:00PM – 9:00PM

WEDNESDAY, MARCH 2, 2005

Registration for SWBESA meeting Location: Foyer B	7:00 AM – 5:00 PM
Poster Viewing Location: Valle Grande	8:00AM – 5:00PM
Job Opportunity Area Location: Valle Grande	8:00 AM – 5:00 PM
Symposia and Submitted Papers Symposium: Applications of Functional Genomics in Entomology Location: Chaco	8:00AM –10:00AM
Submitted Papers: Biological Control and Field Crops Location: Chaco	10:30AM –11:54AM
Symposium: European & Africanized Honey Bees In The Southwest—Current Status & The Future Location: Chaco	1:00PM –2:20PM
Submitted Papers: Stored Products Location: Chaco	2:50PM – 4:02PM
Linnaean Games-Finals Location: Chaco	5:00PM – 7:00PM
Remove Posters	5:00PM – 8:00PM
Dinner on Your Own	

THURSDAY, MARCH 3, 2005

Final Business meeting - SW Branch ESA 8:00AM – 11:00AM
Location: Valle Grande I

Southwestern Branch-ESA New Executive Board (2005-2006) 11:00AM - Noon
Location: Valle Grande I

2004 – 2005 OFFICERS AND COMMITTEES

Phillip Mulder, President
philmul@okstate.edu

John Burd, Past-President
john.burd@ars.usda.gov

Bastiaan (Bart) Drees, Vice-President
b-drees@tamu.edu

David Thompson, Secretary/Treasurer
dathomps@nmsu.edu

Greg Cronholm, Secretary/Treasurer- Elect
g-cronholm@tamu.edu

Marvin Harris, ESA Governing Board Representative
m-harris@tamu.edu

2004 – 2005 OFFICERS AND COMMITTEES

Audit Committee

Grant Kinzer, Chair
gkinzer@nmsu.edu

Jonathan Edelson
Tom Fuchs

Awards Committee

Kris Giles, Chair (05-06)
kgiles@okstate.edu

Brad Kard (06)
Jesus Esquivel (06)
Carol Sutherland (06)
Carlos Bogan (05)
Norman Elliot (05)
Ron Byford (04)
Chris Sansone (04)
Darrell Bay (04)

Branch Archivist

Gregory Cronholm
g-cronholm@tamu.edu

Insect Detection Committee

Carol Sutherland, Chair
csutherl@nmsu.edu

Richard Grantham
John Jackman

Insect Expo Coordinators

Scott Russell, Chair
sarussel@tamu.edu

Andrine Morrison
Bonnie Pendelton
Phillip Mulder

Linnaean Games Committee

Phil Mulder, Chair
philmul@okstate.edu

Ann Weise
Richard Berberet
Richard Grantham
Marvin Harris
Mark Muegge
Harlan Thorvilson
Scott Bundy

Local Arrangement Committee

Scott Bundy, Co-chair
cbundy@nmsu.edu

Mike English, Co-chair
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Membership Committee

Tom Royer, Chair
rtom@okstate.edu

Jesus Esquivel
Marvin Harris
Pat Porter
Dale Spurgeon
Pete Teel
Harlan Thorvilson
Cole Younger
John Burd
Doug van Gundy

Necrology Committee

Jim Reinert, Chair
j-reinert@tamu.edu

Grant Kinzer
Phil Mulder

Nominations Committee

John Burd, Chair
john.burd@ars.usda.gov

Phil Mulder
Pat Morrison
Jim Webster
Terry Mize

Program Chair

Carol Sutherland
csutherl@nmsu.edu

Public Information Committee

Edmond Bonjour, Chair
elb4119@okstate.edu

Charles Chilcutt
Jim Criswell
Forest Mitchell
Nathan Riggs
Carol Sutherland

Resolutions Committee

Bill Ree, Chair
w-ree@tamu.edu

John George
Stan Carroll
Allen Knutson

Site Selection Committee

Greg Cronholm, Chair
g-cronholm@tamu.edu

Jim Reinert
Scott Ludwig
Bart Drees
David Thompson

**Spouses, Guests and Retirees
Coordinators**

Ann Wiese, Co-chair
ann.wiese@bayercropscience.com

Russell Wright, Co-chair
rew0675@okstate.edu

W. Pat Morrison

Student Affairs Committee

Paul Smith, Chair
foghorn_nm@hotmail.com

Fernando Chitio
Ram Shrestha
Doug Jones

**Student Research Paper
And Poster Awards Committee**

Bonnie Pendleton, Chair (04-06)
bpendleton@mail.wtamu.edu

Richard Berberet
Robert Bowling
Roxanne Bowling
Jane Breen Pierce
Scott Bundy
Jack Dillwith
Miles Karner
Jerry Michels
Megha Parajulee
Jeff Tomberlin

Youth Science Committee

Noel Troxclair, Chair
n-troxclair@tamu.edu

Scott Russell
Bonnie Pendleton
Richard Grantham
Pete Teel
M.O. Way
Scott Bundy
Phil Mulder

TA-QUE-NE-WHAP AWARD

Awardee, Year, Affiliation

Manning Price, 1978, TAMU
Hugh Graham, 1978, USDA
Horace Van Cleave, 1987, TAMU
Grant Kinzer, 1997, NMSU
Don Rummel, 1999, TAMU
Don Peters, 2002, OSU
W. Pat Morrison, 2004, TAMU

The Ta-que-ne-whap Award (pronounced Ta-k-ne-wa) for Distinguished Leadership and Service honors members who for many years have contributed exceptional leadership and service to the Southwestern Branch of the Entomological Society of America. The name comes from the southern Comanche dialect and means Chief. The southern Comanche tribe dominated the heart of the Branch area before the coming of the Europeans. Comanches were fiercely independent but willing to defend their society, its interests and values regardless of personal risks. The cast bronze bust of an old Indian chief in full headdress symbolizes one who has led and cared for his society for many years, through good and bad times, giving of himself for the betterment of others. His service is etched in the wrinkles of his face, but his eyes look unblinkingly into the future. His full headdress depicts the many leadership roles, recognitions and honors he earned over the years, which validate his sage words of council and guidance. The pedestal is mesquite wood that grows throughout the area and is noted for its ability to survive harsh conditions and flourish under more favorable times. It is a tough wood that weathers well and retains its strength. Under its rough bark often is hidden an inner quality of beautiful grain and color. The base is tipu-tipuwana wood that was imported into the area. The tipu-tipuwana symbolizes one who is open to new concepts and ideas, which, although foreign to him, may have merit and value. Individuals worthy of this award are rare.

(excerpt from detailed description of award)

FULL PROGRAM

SUNDAY, FEBRUARY 27, 2005

Southwestern Branch, Entomological Society of America---Executive
Committee Meeting
Location: Bernalillo 3:00PM – 5:00PM

MONDAY, FEBRUARY 28, 2005

MEETINGS and ACTIVITIES

Southwestern Branch-ESA Registration
Location: Foyer 3:00PM – 7:00PM

Society for Southwestern Entomologists

Executive Committee Meeting
Location: Valle Grande 3:30PM – 4:00PM

General Membership Business Meeting
Location: Valle Grande 4: 00PM – 5:00PM

Student Mixer
Location: Tijeras Room 7:00PM – ????PM

TUESDAY, MARCH 1, 2005

Registration for SWBESA meeting
Location: Foyer B 7:00AM – 6:30PM

Poster Set Up---**NOTE:** All Student Posters and
All Regular Member Posters will be on display
Tuesday AND Wednesday 7:00AM – 8:00AM
Location: Valle Grande

TUESDAY, MARCH 1, 2005

STUDENT POSTER COMPETITION

LOCATION: Valle Grande

SP-01 Filling in the Gaps in the Map of the Blow Fly (Diptera:Calliphoridae) World.
Amanda Saldana, F. Mariana Tenorio-Griggs and Susan Wallace, Baylor University.

SP-02 Potential Beneficial Impact of *Dictyna* sp. In a New Mexico Cotton Agroecosystem.
Sean M. O'Donnell, C. Scott Bundy and Paul F. Smith, New Mexico State University

SP-03 Using PCR based techniques to accurately identify and distinguish the fire ants,
Solenopsis xyloni and *S. invicta*. **Alana Jacobson** and David C. Thompson, New Mexico
State University.

SP-04 Development of a Female Attractant for Stored Product Moths (Lepidoptera:
Pyralidae). **Charles Konemann**, Thomas W. Phillips, Oklahoma State University;
Christian Nansen, The Steritech Group, Inc., Charlotte, NC; J.W. Dillwith, Oklahoma State
University.

SP-05 Comparison of Arthropod Diversity on Saltcedar, Coyote Willow, and Cottonwood
at the Bosque del Apache National Wildlife Refuge. **Howard Beuhler** and David C.
Thompson, New Mexico State University.

SP-06 Monitoring Circadian Production of Honeydew: Proof of Concept. **Jake Duskocil**,
Texas A&M University; Juan Lopez, USDA, ARS; Dan Martin, USDA, ARS; Marvin Harris,
Texas A&M University.

SP-07 Ecology of *Reticulitermes flavipes* (Isoptera: Rhinotermitidae) on the Oklahoma
Tallgrass Prairie Preserve. **Greg H. Broussard**, Kenneth S. Brown and Brad Kard,
Oklahoma State University.

SP-08 Diversity, Population Dynamics and Interactions of Ant Assemblages
(Hymenoptera: Formicidae) in Pecans in Mumford, Robertson Co., Texas. **Alejandro
Calixto**, Marvin Harris, Allen Knutson, Charles Barr and Kirk Winemiller. Texas A&M
University.

SP-09 *Reticulitermes flavipes* (Isoptera: Rhinotermitidae) Proteome Characterization. **C.
Jerry Bowen**, Robin D. Madden, Jack W. Dillwith, and Brad Kard. Oklahoma State
University.

TUESDAY, MARCH 1, 2005

SUBMITTED POSTERS

LOCATION: Valle Grande

P-01 Physical Exclusion of Insects from Stored Grain: Laboratory and Field Studies.

J. Andrew Puckette, Thomas. W. Phillips, Edmond L. Bonjour, and Randy Beeby, Oklahoma State University.

P-02 The Effect of Particle Film Treated Apple on the Behavior of Apple Maggot

(*Rhagoletis pomonella*). **Gary Puterka**, Michael Glenn, and Tracy Leskey, Plant Science Research Laboratory, USDA, ARS, Stillwater, OK.

P-03 Biotypic Diversity Among North American Russian Wheat Aphid Populations. **John**

D. Burd, David R. Porter, and Gary J. Puterka, Plant Science Research Laboratory, USDA, ARS, Stillwater, OK .

P-04 Effects of Delaying Grazing Initiation Date in Dual-Purpose Wheat on Arthropod Abundance and Grain Yield. **E. A. Ismail**, Cairo University, Giza, Egypt; K. L. Giles, T. A. Royer, E.G. Krenzer and G.W. Horn, Oklahoma State University; G. J. Michels and J. B. Bible, TAES, Bushland, TX.

P-05 The Spiders of Cotton in New Mexico. **Scott Bundy**, Paul Smith, and David Richman, New Mexico State University.

P-06 Update on Biological Control of Saltcedar in New Mexico. **David C. Thompson** and Kevin T. Gardner, New Mexico State University.

P-07 OSU's Educational Outreach Program: Reaching 300,000 Oklahomans on 1000 Dollars a Year! **Andrine Morrison** and Phillip Mulder, Oklahoma State University.

P-08 Susceptibility of *Poa* spp. to Bluegrass Billbug, *Sphenophorus parvulus*. **James Reinert**, James Read, Joe McCoy, James Heitholt, Texas Agricultural Experiment Station; and Robert Bauernfeind, Kansas State University.

P-09 Monitoring Adult Activity by Nantucket Pine Tip Moth and Evaluation of Bayer Advanced Tree and Shrub Insect Control for Their Suppression. **Robert Bowling**, Texas Cooperative Extension; Roxanne Bowling, West Texas A&M University; and C. Quintana, Texas A&M University.

P-10 Host Plants of *Lygus lineolaris* in Central Texas. Sharon Mowery and **Jesus Esquivel**, USDA-ARS-APMRU, College Station, TX.

P-11 Identifying Resistance to Cotton Fleahopper in Cotton. **Allen Knutson**, Texas A&M University, E. Bynum and C. Wayne Smith.

P-12 Mosquito Vectors of the West Nile Virus in Oklahoma. **Lisa Coburn** and Russell Wright, Oklahoma State University.

P-13 Importance of Genetic Relationships Among Cave Crickets (Rhaphidophoridae: *Ceuthophilus*) from Guadalupe Escarpment Caves. **Fay Mayer**, Texas Tech University.

P-14 Amitraz Resistance in the Southern Cattle Tick. **Andrew Chen**, Haiqi He and Ronald Davey, USDA-ARS, Kerrville, TX.

P-15 Effects of Bt-cotton (Bollgard II), Non-Bt Cotton and Cabbage on Fifth Instar Cabbage Looper. **Yuan-Xi Li**, T.-X. Liu, Texas Agricultural Experiment Station; and S. M. Greenberg, USDA ARS, Kika de la Garza Subtropical Agriculture.

P-16 Relationship Between Morphology of Cowpea Grain and Resistance to Cowpea Weevil (Coleoptera: Bruchidae). **Michael W. Pendleton**, Texas A&M University; Fernando M. Chitio, West Texas A&M University; Bonnie B. Pendleton, West Texas A&M University; and Thomas C. Stephens, Texas A&M University.

P-17 Comparison of Morphology of Sorghum Grain to Resistance to Maize Weevil (Coleoptera: Curculionidae). **Michael W. Pendleton**, Texas A&M University; E. Ann Ellis, Texas A&M University, Fernando M. Chitio, West Texas A&M University; and Bonnie B. Pendleton, West Texas A&M University.

P-18 Biology and Life History of the Great Southern White (*Ascia monuste monuste*) (Lepidoptera: Pieridae) on cabbage. **Tong-Xian Liu**, Texas Agricultural Experiment Station.

P-19 Efficacy of YieldGard® CRW, YieldGard® Plus and Poncho® 1250 Against Western Corn Rootworm and Corn Borer. **Robert Bowling**, Texas Cooperative Extension; Roxanne Bowling, West Texas A&M University; and C. Quintana, Texas A&M University.

P-20 Using Pecan Nut Casebearer Pheromone Traps for Predicting Nut Entry. **Mark Muegge**, Allen Knutson, Texas Cooperative Extension; and Doug Stevenson, Texas A&M University.

P-21 Population Dynamics of the Beet Leafhopper in Southern New Mexico During 2000-2004. **Rebecca Creamer**, New Mexico State University.

P-22 Ground-Based Remote Sensing for Aphid-Induced Stress and Aphid Density Estimation in Wheat in Field Conditions. **Mustafa Mirik**, Gerald Michels, Texas Agricultural Experiment Station; Norman Elliott, USDA ARS, Stillwater, OK; Sabina Kassymzhanova-Mirik, Texas Agricultural Experiment Station; and Vasile Catana, Oklahoma State University.

P-23 An Aphid (Homoptera:Aphididae) Damage Quantification Method in Winter Wheat Using Digital Image Analysis and Spectral Reflectance Data. **Mustafa Mirik**, Gerald Michels, Texas Agricultural Experiment Station; Sabina Kassymzhanova-Mirik, Texas Agricultural Experiment Station; Norman Elliott, USDA ARS; and Vasile Catana, Oklahoma State University.

P-24 Response by Fall Armyworm and Western Bean Cutworm (Lepidoptera: Noctuidae) Larvae Presented Corn Event TC1507. **Robert Bowling**, Texas Cooperative Extension; Roxanne Bowling, West Texas A&M University; C. Quintana, Texas A&M University; and Bonnie Pendleton, West Texas A&M University.

P-25 Alternatives to Organophosphates and Carbamates for Managing Aphids in Wheat and Sorghum. **Roxanne Bowling**, Bonnie Pendleton, West Texas A&M University; Robert Bowling, Texas Cooperative Extension; and Jerry Michels, Texas Agricultural Experiment Station.

P-26 Effects of Rotation, Tillage, and Fertilizers on Sorghum Head Insects. **Charles Chilcutt**, Texas Agricultural Experiment Station.

P-27 Dynamics of Aphid Populations on Wheat in Oklahoma. **Vasile Catana**, Oklahoma State University; Norman Elliott, USDA ARS; Kristopher Giles, and Mpho Phoofolo, Oklahoma State University.

Poster Viewing

Location: Valle Grande

8:00AM – 5:00PM
(Continue through Wednesday)

Job Opportunity Area

Location: Valle Grande

8:00AM – 5:00PM

Presentation Preview- Presentation Collection Area

Location: Foyer B

8:00AM – 5:00PM

TUESDAY, MARCH 1, 2005

Plenary Session

Location: Chaco

8:00AM – 10:00AM

Call to Order: President **Phil Mulder**

Welcome: **Honorable Martin Chavez**, Mayor of Albuquerque

ESA Foundation Report: **Frank Gilstrap**

ESA Governing Board Report: **Marvin Harris**

Message from the ESA Executive Director: **Paula Lettice**

SWB-ESA Presidential Address: **Phil Mulder**

Necrology Report: **James Reinert**

Announcements: **Phil Mulder**

*Keynote Speaker: **Dr. Gloria DeGrandi-Hoffman**; Research Leader, Carl Hayden Bee Research Center; USDA-ARS; 2000 E. Allen Road; Tucson, AZ 85719

Understanding a Conversion Experience: The Africanization of European Honey Bee Populations.

Break

Location: Valle Grande

10:00AM - 10:30AM

THANK YOU, SPONSORS!

Students---Stand by Your Posters, Answer Questions

Location: Valle Grande

10:00AM – 11:00AM

MANDATORY MEETING: ALL CHAIRS OF ALL SWBESA COMMITTEES

Location: Chaco

11:00AM – noon

LUNCH---on your own

11:30AM – 1:00 PM

TUESDAY, MARCH 1, 2005

TIME **STUDENT COMPETITION, ORAL PRESENTATIONS**
LOCATION: Chaco

Moderator: Bonnie Pendleton, West Texas A&M University

- 1:00PM SO-01 Potential of Hybridization Between Mixed Populations of Crete and Fukang Saltcedar Leaf Beetle Ecotypes. **Beth Petersen** and David C. Thompson, New Mexico State University.
- 1:12PM SO-02 Microclimate Effects on Beneficial Arthropods in Okra-leaf Cotton. **Tamara Booze** and Scott Bundy, New Mexico State University.
- 1:24PM SO-03 Evidence for a Novel Mutualism in the Tropical Understory Shrub *Piper urostachym*. **Amanda Hodson**, University of New Mexico; and Karin Gastreich, Duke University.
- 1:36PM SO-04 Comparative Morphology of *Reticulitermes* sp. (Isoptera: Rhinotermitidae) of Oklahoma. **Kenneth S. Brown**, Bradford M. Kard and Mark E. Payton, Oklahoma State University.
- 1:48PM SO-05 Physical and Chemical Factors Affecting Oviposition by the Indianmeal Moth, *Plodia interpunctella* Hubner (Lepidoptera: Pyralidae). **Kishan Sambaraju**, Thomas Phillips and Jack Dillwith, Oklahoma State University.
- 2:00PM SO-06 Integrating Effects of Natural Enemies into Winter Wheat Greenbug Management. **Douglas Jones** and Kristopher Giles, Oklahoma State University.

2:12PM
to
2:40PM

BREAK

Location: Valle Grande

THANK YOU, SPONSORS!

TUESDAY, MARCH 1, 2005

**SYMPOSIUM: URBAN
ENTOMOLOGY: FACING THE
CHALLENGES**

Location: Chaco

**MODERATOR: Scott Ludwig,
Texas A&M University**

**SYMPOSIUM: BUGS IN FIELD
CROPS**

Location: Bandelier

**MODERATOR: Scott Bundy, New
Mexico State University**

- | | | |
|--------|---|---|
| 2:40PM | U-1 Challenges Facing the Nursery and Greenhouse Industry: The Impact on the Home Landscape. Scott Ludwig , Texas A&M University | B-1 Recent Stink Bug Problems in Soybeans on the Upper Gulf Coast. M.O. Way , M.S. Nunez, Texas A&M University, Beaumont. |
| 3:00PM | U-2 Interacting with Urban Clientele. Wizzie Brown , Texas A&M University. | B-2 Laboratory Evaluation of Insecticides for Cotton Fleahoppers and Stink Bugs. Juan D. Lopez Jr. and M. A. Latheef, USDA-ARS, College Station. |
| 3:20PM | U-3 Advances in Fire Ant Management in the Urban Landscape. Bart Drees , Texas A&M University. | B-3 Background and Status of Southern Green Stink Bug Research Activities in Central Texas. Jesus Esquivel , USDA-ARS-APMRU. |
| 3:40PM | U-4 Urban Arthropods in New Mexico: Trends and Invaders. Carol Sutherland , New Mexico State University. | B-4 Using Trap Crops as a Management Tool for Stink Bugs and Leaf-footed Bugs in a Pecan IPM Program. Jake Duskocil , Oklahoma State University; Bill Ree, Texas Cooperative Extension, Bryan. |
| 4:00PM | O-01 Biology and Management of Agave Weevil, <i>Scyphophorus acupunctatus</i> . Carlos Bogran , Texas Cooperative Extension; Steve Thompson, Texas A&M University. | O-02 Assassin Bugs as Predators of Newly Introduced Saltcedar Leaf Beetles. David C. Thompson and C. Scott Bundy, New Mexico State University. |
| 4:12PM | END | END |

Linnaean Games-Preliminary Rounds - Phil Mulder, Moderator

Location: Chaco

5:00PM – 6:30PM

TUESDAY, MARCH 1, 2005

Banquet and Student and Special Awards Presentations

Location: Bandelier & Tijeras Social Time, Cash Bar	6:30PM – 7:00PM
Dinner and Program Message from the ESA President's Office: Mike Ivey Presentation of Awards	7:00PM – 9:00PM

WEDNESDAY, MARCH 2, 2005

POSTER SESSION—8:00AM to 5:00PM—STUDENT COMPETITION & REGULAR MEMBER CATEGORIES

Location: Valle Grande

TIME SYMPOSIUM: APPLICATIONS OF FUNCTIONAL GENOMICS IN ENTOMOLOGY

Location: Gran Quivera

MODERATOR: Jack W. Dillwith, Oklahoma State University

- 8:00AM T-01 An Overview of Emerging Technologies Available to Entomologists. **Jack W. Dillwith**, Robin D. Madden, Oklahoma State University.
- 8:40AM T-02 Genetic Evaluation of Alfalfa Weevil, *Hypera postica*, Populations in New Mexico. **Paul F. Smith**, C. Scott Bundy, Steve Hanson, Dennis Sutton, New Mexico State University.
- 9:00AM T-03 Proteomic Applications in Termite Biology. **C. Jerry Bowen**, Robin D. Madden, Jack W. Dillwith, Oklahoma State University.
- 9:20AM T-04 A Metabolomics Study of Aphid Adaptations to Low Temperatures. **Rebecca Pace**, Robin D. Madden, Jack W. Dillwith, Oklahoma State University.
- 9:40AM T-05 Applicability of RNAi in Tick Research. **Vijay G. Ramakrishnan**, Shahid Karim, James S. Tucker, John R. Sauer, Richard C. Essenberg, Oklahoma State University.

10:00AM
to
10:30AM

BREAK
Location: Valle Grande
THANK YOU, SPONSORS!

WEDNESDAY, MARCH 2, 2005

TIME ORAL PRESENTATIONS: BIOLOGICAL CONTROL & FIELD CROPS

ROOM: Gran Quivera

MODERATOR: Paul Smith, New Mexico State University

- 10:30AM O-03 Population Dynamics of Insect Predators in Cereal Monoculture Versus Diverse Cropping Systems. **Mpho Phoofolo** and Kris Giles, Oklahoma State University; Norman Elliott, USDA-ARS, Stillwater, OK.
- 10:42AM O-04 Release of *Diorhabda elongata* for Biological Control of Saltcedar in Texas. **Allen Knutson**, Texas A&M University; C. Jack DeLoach, USDA, ARS, Temple TX; J. Hudgeons, and Mark Muegge, Texas A&M University.
- 10:54AM O-05 Beetles Find New Home in the Texas Panhandle: Release of *Diorhabda elongata* on a Saltcedar Invasion along the Canadian River. **Vanessa Carney**, G. J. Michels, Texas Agricultural Experiment Station, and B. L. Castleberry, USDA-ARS Conservation and Production Research Laboratory.
- 11:06AM O-06 Feeding and Reproduction of Boll Weevil in the Cotton Free Period and Growing Season in the Lower Rio Grande Valley of Texas. **S.M. Greenberg**, J.S. Armstrong, USDA-ARS, APMR Unit, Weslaco, Texas; R. J. Coleman, USDA-ARS, BIRU, Weslaco, Texas; T. -X. Liu, Texas A&M University, Weslaco, Texas
- 11:18AM O-07 Genetic Representation of Pheromone Trap-Captured *Heliothis virescens* and *Helicoverpa zea* (Lepidoptera: Noctuidae) Males Mass Mated with Laboratory-Reared Females. **Carlos Blanco**, USDA-ARS, SIMRU; Douglas Sumerford, USDA-ARS, Ames, IA; Juan D. Lopez, USDA-ARS, College Station, TX; Gerardo Hernandez, CINVESTAV, Mexico City, MX.
- 11:30AM O-08 Associations of Normalized Difference Vegetative Index (NDVI), Arthropod Density, Plant Architecture and Agronomic Diversity in Acala 1517 Cotton. **Tracey Carrillo** and Joe Ellington, New Mexico State University.
- 11:42AM O-09 Long-Term Perspectives for Biological Control in Field Crops. **Joe Ellington** and Tracey Carrillo, New Mexico State University
- 11:54AM END-LUNCH ON YOUR OWN

WEDNESDAY, MARCH 2, 2005

TIME **STORED PRODUCTS ENTOMOLOGY**
LOCATION: Chaco

MODERATOR: Tom Phillips

- 2:50PM O-10 Effects of *Bracon hebetor* (Hymenoptera: Braconidae) on Suppression of Indianmeal Moth (Lepidoptera: Pyralidae) Populations in the Laboratory and Field Conditions. **Mukti Ghimire**, Yong Chung; Thomas Phillips, Oklahoma State University.
- 3:02PM O-11 Field Evaluation of Spinosad and Chlorpyrifos-methyl Against Stored Wheat Insect Pests. **Edmond Bonjour**, Thomas Phillips, Oklahoma State University; Terry Pitts, Gustafson, LLC.
- 3:14PM O-12 Potential of Using Insect Growth Regulators to Control Stored Product Pests. **Siwei Liu**, Thomas W. Phillips, Oklahoma State University, Franklin H. Arthur, USDA ARS, Manhattan, KS., and Baige Zhao, Oklahoma State University.
- 3:26PM O-13 Recruitment and Development of the Lesser Grain Borer, *Rhyzopertha dominica* (Coleoptera: Bostrichidae), on Different Plant Species. **Peter Edde** and Thomas Phillips, Oklahoma State University.
- 3:38PM O-14 Evaluation of Attract-and-Kill Insecticide Formulations Against Indianmeal moth, *Plodia interpunctella*. **Manuel Campos** and Thomas Phillips, Oklahoma State University.
- 3:50PM O-15 Mating Disruption for Stored-Product Moths: Research Toward Commercial Development. **Tom Phillips**, Charlie Konemann, Department of Entomology and Plant Pathology, Oklahoma State University, Margie Barton, Mike Merchant, TAMU Cooperative Extension, Dallas, TX, Andy Allen, Bhadriraju Subramanyam, Dept. of Entomology, Kansas State University, Manhattan, KS, and Jeff Weier, Sprague Pest Solutions, Tacoma, WA

Linnaean Games-Finals and Awards Ceremony

Location: Chaco

5:00PM – 7:00PM

Remove Posters

5:00PM – 8:00PM

Dinner on Your Own

THURSDAY, MARCH 3, 2005

Final Business Meeting - SW Branch ESA

8:00AM – 11:00AM

Location: Valle Grande I

Southwestern Branch-ESA New Executive Board (2005-2006)

11:00AM - Noon

Location: Valle Grande I

SOUTHWESTERN BRANCH, ENTOMOLOGICAL SOCIETY OF AMERICA

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P - Submitted Poster
SO – Student Oral Presentation
Competition
SP – Student Poster Competition

B – Bugs Symposium
T – Technology Symposium
U – Urban Symposium
Z – Bees Symposium

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PRESIDENTS AND CHAIRMEN OF SWB-ESA

President or Chairman	Year	Location
Pres. Phillip G. Mulder, Jr.	2004-05	Albuquerque, NM
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Chm. R.L. Hanna	1965-66	El Paso, TX
Chm. H.E. Meadows	1964-65	Austin, TX
Chm. Dial E. Martin	1963-64	Monterrey, Mexico

Chm. Manning A. Price	1962-63	Houston, TX
Chm. Sherman W. Clark	1961-62	Oklahoma City, OK
Chm. O.H. Graham	1960-61	San Antonio, TX
Chm. Clyde A. Bower	1959-60	El Paso, TX
Chm. Paul Gregg	1958-59	Dallas, TX
Chm. C.R. Parencia	1957-58	Houston, TX
Chm. J.C. Gaines	1956-57	San Antonio, TX
Chm. D.C. Earley	1955-56	Ft. Worth, TX
Chm. John M. Landrum	1954-55	Houston, TX
Chm. D.E. Howell	1953-54	Dallas, TX
Chm. P.J. Reno	1952-53	Galveston, TX
Chm. R.C. Bushland	1951-52	San Antonio, TX
Chm. H.G. Johnston*	1950-51	Dallas, TX

* Southwestern Branch, American Association of Economic Entomologists

ADDENDA AND NOTES

ABSTRACTS

Abstracts arranged by presentation group.

SP = Student Poster
SO= Student Oral Presentation

P=Submitted Poster
O=Submitted Oral Presentation

STUDENT POSTERS

SP-01: A. Saldana, F. Tenorio-Griggs and S. Wallace. Baylor University.

Filling in the Gaps in the Map of the Blow Fly (Diptera: Calliphoridae) World.

This study was conducted in Waco, Texas (McLennan County). Blow Fly (Diptera:Calliphoridae) populations were studied for the purpose of generating a catalogue of the species in the area with relation to temperature and season. An inverted hanging trap was used to capture the flies and ground beef was used as bait. Preliminary results of the study are presented.

SP-02: Sean O'Donnell, Scott Bundy and Paul Smith, New Mexico State University.

Potential Beneficial Impact of *Dictyna* sp. In a New Mexico Cotton Agroecosystem.

Spiders of the family Dictynidae were surveyed in order to determine their role as beneficials in cotton agroecosystems in New Mexico. A total of four cotton fields were surveyed in the areas surrounding Las Cruces, New Mexico. Two of the fields consisted of Upland (Acala), and two of the fields consisted of Bt cotton. Sampled rows were systematically selected and a five foot section of each row was sampled. Prey items found in the webs were counted and identified. Overall, we found that Dictynids were present in high number throughout each of these four fields, however, they did not appear to have any significant impact on major cotton pests.

SP-03: Alana Jacobson and David Thompson. New Mexico State University.

Using PCR based techniques to accurately identify and distinguish the fire ants, *Solenopsis xyloni* and *S. invicta*

Doña Ana County, New Mexico was quarantined in 1998 for red imported fire ant, *Solenopsis invicta*. This very aggressive ant species displaces native ant populations, disrupts natural ecosystems, interferes with agricultural operations, and is a health hazard to livestock, wildlife and people. The predominant fire ant in the SW United States is the southern fire ant, *S. xyloni*, that is commonly confused with *S. invicta*. A previous study examining the morphological variation of the distinguishing characteristics, the clypeal

tooth, striations of the mesopleuron, length of antennal scape, the petiolar process, number and size of mandibular teeth, and color, showed morphological variability occurs in both *S. xyloni* and *S. invicta* populations. This creates an area of overlap where either of the two species could exhibit the characteristic making positive identification difficult, especially in locations where they coexist. Polymerase chain reaction (PCR) based techniques are commonly used to identify molecular differences that exist between two species. In this study, short segments of mitochondrial DNA from populations of *S. invicta* and *S. xyloni* were sequenced, and restriction maps of the two sequences were made. Digestion of the PCR product with the HinfI enzyme produces distinct banding patterns for both species, providing an effective method to distinguish the two fire ant species.

SP-04: Charles Konemann, Thomas W. Phillips, Oklahoma State University; Christian Nansen, The Steritech Group Inc., Charlotte, NC; and Jack W. Dillwith, Oklahoma State University.

Development of a Female Attractant for Stored Product Moths (Lepidoptera: Pyralidae)

Preliminary studies demonstrated that a potential female moth attractant was effective in catching female Indianmeal moths (IMM) in controlled laboratory tests. The attractant was then tested against four species of moths from the family Pyralidae that are major pests to stored products including the Indianmeal moth, *Plodia interpunctella* (Hübner); almond moth, *Cadra cautella* (Walker); Mediterranean flour moth, *Ephestia kuehniella* (Zeller) and the rice moth, *Corcyra cephalonica* (Stainton). Each species was tested in a separate controlled trapping experiment over a 7 day period using 20 traps: 10 were baited with the attractant and ten were blank controls. A mean of 14.2 (± 4.9) IMMs were captured in baited traps compared to a mean of 0.6 (± 0.3) moths in the control traps. In the almond moth test, 3.7 (± 1.2) moths were caught in baited traps while only 0.3 (± 0.2) moths were captured in blank trap. For the Mediterranean flour moth, a mean of 1.9 (± 0.5) moths were captured compared to 0.3 (± 0.2) moths in control traps. The rice moth showed no response to the attractant. This study showed that three of the four stored product moths tested responded to the female attractant. The attractant is a mixture of naturally occurring food volatiles for which a patent application has been filed and a commercial product is being sold under the name Moth Suppression[®].

SP-05: Howard Beuhler and David Thompson, New Mexico State University.

Refuge Comparison of Arthropod Diversity on Saltcedar, Coyote Willow, and Cottonwood at the Bosque del Apache National Wildlife

Saltcedar (*Tamarix* spp.) is a well-known invasive weed of riparian habitat along western waterways. There are now widespread eradication programs usually involving mechanical or chemical methods. Biological control, using the Chinese leaf beetle (*Diorhabda elongata*), has the potential to provide inexpensive, long-term management. However, the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) is known to use saltcedar as a nesting site. This has effectively shut down beetle releases in any area that

may provide habitat for this bird. The impact of saltcedar removal on the willow flycatcher is unknown; the bird may use alternate nesting sites, and saltcedar may not support an arthropod community conducive to the diet of this bird. To investigate the latter, four plots of vegetation were delineated to compare the arthropod communities on saltcedar with those on native riparian vegetation. The plots were located in the Bosque del Apache National Wildlife Refuge, known southwestern flycatcher habitat. They consisted of monotypic stands of saltcedar (*Tamarix ramosissima*), coyote willow (*Salix exigua*), and Fremont cottonwood (*Populus fremontii*). Additionally, arthropods were collected from these three tree types in a mixed stand containing all three. Insect and other arthropods were sampled by visual observation and by sweep netting. This poster presents and compares the data from these sampling methods for the different stand and tree types. This data is then related to known diet information for the southwestern willow flycatcher.

SP-06: J. Duskocil, D. Martin and M. Harris. Texas A&M University

Monitoring Circadian Production of Honeydew: Proof of Concept

Sucking insects typically produce copious amounts of sticky liquid excrement (honeydew) consisting primarily of water and some sugars. Release of this material in the environment provides a substrate for decomposers and attracts sugar feeders. Little is known regarding circadian production of honeydew and quantification of amounts produced through time has been difficult. A method for monitoring the amount and time of production of honeydew by *Monellia caryella* was developed by modifying a Harris-Coble clock trap apparatus and interfacing with existing spray technologies to interpret the data gathered. The clock trap was placed beneath the foliage of *Monellia caryella* infested pecan seedlings. The honeydew was captured on exposed portions of the rotating trap surface and visualized utilizing water sensitive paper so that volume deposited and time of deposition could be determined. Each time increment represented an independent sample, which was compared to other increments within each collection period. The water sensitive paper was scanned and digitized for computer software analysis of honeydew volume produced through time. This method provides an effective and cost efficient way to document the volume and time of production of honeydew in ecosystems. We expect the technique to be widely applicable to many environments where sucking insects are studied.

SP-07: Greg H. Broussard, Kenneth S. Brown and Brad Kard. Oklahoma State University.

Ecology of *Reticulitermes flavipes* (Isoptera: Rhinotermitidae) on the Oklahoma Tallgrass Prairie Preserve.

Termites are important structural pests in the United States and are capable of causing extensive damage to houses and other wooden structures. Costs for control, prevention, and repair of termite damage can reach \$2 billion annually. Recent increases in the use of more directed termite control techniques such as baits and baiting systems has helped to renew an interest in basic termite ecology and colony characteristics. Termites are

known to play an important role in any ecosystem in which they are found. A better understanding of their role could lead to improved control strategies and techniques.

One such ecosystem is native tallgrass prairie. The Nature Conservancy's Tallgrass Prairie Preserve is located in Osage County, north of Pawhuska, Oklahoma. Although termites are abundant on Oklahoma native tallgrass prairies, there have been no termite related studies conducted to date. The Preserve provides a unique opportunity to study the ecology of the eastern subterranean termite (*Reticulitermes flavipes* Kollar) in a non-disturbed natural habitat. Oklahoma State University's Structural and Urban Entomology Program is currently investigating several aspects of termite ecology on The Tallgrass Prairie Preserve. These investigations include studies to determine termite foraging territories, foraging depths and changes in soil properties over time, and termite influence on plant growth and diversity.

SP-08: A. Calixto, Marvin Harris, Allen Knutson, Charles Barr and Kirk Winemiller. Texas A&M University.

Diversity, Population Dynamics And Interactions of Ant Assemblages (Hymenoptera: Formicidae) In Pecans In Mumford, Robertson Co., Texas.

Alpha diversity, population dynamics and interactions of ant assemblages were studied in a pecan orchard located in Mumford, Texas. The assemblages included the red imported fire ant (RIFA), *Solenopsis invicta* Buren. The study addressed the question of what is the response of the ant assemblage after reducing RIFA following insecticide applications (bait and contact insecticide) and the impact of these on individual species. To approach this question, three treatments were established in a 16 hectare area in the orchard. The treatments were randomly assigned in 1.33 hectare blocks with four replications and periodically monitored. Treatments were: 1) insect growth regulator (IGR) bait treatment (ExtinguishTM, 0.5% s-methoprene) applied twice in 2000 and once in 2001; 2) chlorpyrifos (LorsbanTM, 44.9% chlorpyrifos) applied on tree trunks four times in 2000 and once in 2001; and 3) untreated Control. Blocks were sampled using pitfall traps, baited vials, direct sampling, and colony counts. Data were analyzed by using ANOVA-GLM with the LSD multiple comparison test to compare the effect of treatment on the ant assemblage (using the Shannon index) and the effect on individual species. The ant assemblage consisted of 16 ant species. *S. invicta* was the most abundant followed by *Paratrechina* sp. and *Monomorium minimum*. The IGR treatment consistently reduced RIFA (77%). Native ants were found to coexist with RIFA in the Control and chlorpyrifos plots at lower densities and maintained higher densities in IGR plots. Chlorpyrifos trunk treatment did not have a significant impact on RIFA or native ant densities. The native ant, *Dorymyrmex flavus*, was greater in IGR plots following RIFA reduction and higher densities were found to persist for more than two years after the last IGR treatment.

SP-09: Jerry Bowen, Robin D. Madden, Jack W. Dillworth and Brad Kard, Oklahoma State University.

***Reticulitermes flavipes* (Isoptera: Rhinotermitidae) Proteome Characterization.**

Advances in the knowledge of fundamental termite biology enhance our ability to comprehend the workings of applied research. This study was conducted to establish methods for characterizing the *Reticulitermes flavipes* proteome and to provide a foundation for future research pertaining to the *R. flavipes* proteome. *R. flavipes* were collected from Stillwater, OK and maintained in the laboratory for a minimum of 30 days. Termites were harvested and converted to a whole-body termite protein extract. Proteins were separated using two-dimensional polyacrylamide gel electrophoresis (2D-PAGE). Visualization was completed by the use of Coomassie brilliant blue staining and silver staining. A protein map of the resulting protein spot pattern was generated by numbering each spot and assigning Cartesian coordinate measurements correlating to isoelectric point (pI) and molecular weight (MW). After mapping, *R. flavipes* protein characterization was initiated using matrix assisted laser desorption/ionization – time of flight (MALD-TOF) mass spectrometry to generate peptide mass fingerprints (PMFs). Protein identification was initiated by comparing the PMF against various databases for a putative identification. Next, chemically assisted fragmentation was conducted to generate amino acid sequence data to verify the accuracy of the *R. flavipes* protein identification. This initial study of the proteome will facilitate future research among *R. flavipes* as well as with other termite species.

STUDENT ORAL PRESENTATIONS

SO-01: Beth Petersen and David Thompson, New Mexico State University.

Potential of Hybridization between Mixed Populations of Crete and Fukang Saltcedar Leaf Beetle Ecotypes

Saltcedar (*Tamarix* sp.) is an invasive riparian shrub/tree in the western United States that displaces native plants, increases soil salinity and wildfires, lowers water tables, and reduces water availability for agriculture. *Diorhabda elongata* (Coleoptera: Chrysomelidae) feeds exclusively on saltcedar in Europe and Asia. The biological control potential of seven ecotypes is being tested; they include Fukang and Turpan from China, Chilik from Kazakhstan, Thessaloniki and Crete from Greece, Karshi from Uzbekistan and Tunis from Tunisia. The Fukang ecotype is defoliating large acreages of saltcedar at research sites in the northern half of the western United States, while in the southern half the Crete ecotype is being released. Both Fukang and Crete populations are increasing where they have been released in the field and it is highly likely that their distributions will overlap in the future. The objective of this experiment was to determine the extent and likelihood of hybridization between the Fukang and the Crete ecotypes. Fukang and Crete beetles will mate and produce viable eggs when confined; however, essentially, all of the F1 offspring are sterile. The consequences of hybrid matings could disrupt long-term population dynamics in a mixed field population, slowing population growth or causing localized extinction of one ecotype. While it is still unknown if either the Fukang ecotype or the Crete ecotype will disperse north or south, we know that in a no-choice controlled environment the two ecotypes will readily mate with each other. When given a choice of mates, as would occur in a mixed field population, there is evidence for some level of assortive mating. Experiments were carried out in a controlled, small caged environment, differing in male and female combinations, and in a controlled, larger cage environment using an equal amount of Fukang and Crete ecotypes. In both these experiments, pure and cross mating was monitored. Hybrid mating was common, about 50% of the matings were hybrids. Showing that there is very little assortive mating occurring when given a choice.

SO-02: Tamara Booze and Scott Bundy. New Mexico State University.

Microclimate Effects on Beneficial Arthropods in Okra-leaf Cotton

The effects of okra-leaf cotton on beneficial arthropods were assessed by comparison of large field plots of Acala okra-leaf (W 1218) cotton and conventional (1517-99) cotton. Microclimate differences were evaluated by comparing leaf area, temperature, relative humidity and photosynthetically active radiation (PAR). Seasonal populations of beneficials were estimated using sweep-samples. Seasonal pest populations, including cotton aphid, were also examined. These components of microclimate were examined in order to better understand the impact that the "open-canopy" okra-leaf cotton variety may

have on the arthropods commonly found in this crop. Arthropods may or may not find the okra-leaf cotton crop attractive due to this unusual canopy characteristic.

SO-03: Amanda Hodson, University of New Mexico and Karin Gastreich, Duke University.

**Evidence for a Novel Mutualism in the
Tropical Understory Shrub *Piper urostachym***

We tested the impact of a predatory species of the family Miridae (Hemiptera) on its host plant *Piper urostachym* by comparing folivory in mirid-excluded plants and controls. We also tested the effect of resident anyphaenid spiders on mirid behavior and levels of folivory. Plants without mirids suffered significantly more folivory than plants with mirids. The impact of spider removal was less clear. Together, these results support the idea that resident Mirids serve in anti-herbivore defense for *P. urostachym* plants.

SO-04: Kenneth Brown, Bradford M. Kard and Mark Peyton, Oklahoma State University.

**Comparative Morphology of *Reticulitermes* sp.
(Isoptera: Rhinotermitidae) of Oklahoma**

Key diagnostic morphological features for identifying *Reticulitermes flavipes*, *R. virginicus*, *R. tibialis*, and *R. hageni* collected from Oklahoma were identified and compared. Stepwise principle component analysis identified nine features useful for species determination. These features successfully identified 100% of *R. tibialis* and *R. hageni* specimens. However, fourteen soldier features for *R. flavipes* and *R. virginicus*, including pronotum width, showed interspecific overlap. Among soldiers whose species identification was confirmed with alates, the ratio of soldier head capsule length without mandibles to head capsule width separated these two species. Analysis of *R. flavipes* and *R. virginicus* features identified five discriminant factors that are useful in separating these two sympatric species. However, no factor was 100% definitive in separating these two species. Utilization of these five discriminant factors resulted in 88.89% and 82.61% correct identification of *R. flavipes* and *R. virginicus*, respectively. Correct species identification based only on soldiers remains tentative.

SO-05: Kishan Sambaraju, Thomas Phillips and Jack Dillwith, Oklahoma State University.

**Physical and Chemical Factors Affecting Oviposition by the
Indianmeal Moth, *Plodia interpunctella* Hubner (Lepidoptera: Pyralidae)**

The Indianmeal moth, *Plodia interpunctella* Hübner (Lepidoptera: Pyralidae) is a serious pest of stored food commodities in the United States. Bioassays were conducted to study

the oviposition behavior of *P. interpunctella* in response to 1) the presence to different artificial substrates, and 2) different concentrations of walnut oil and its thin layer chromatographic (TLC) fractions. Separate no-choice bioassays were conducted in 5.7 L plastic boxes containing a 'food dish', a 5-cm diameter glass Petri dish containing either of the following artificial substrates viz. 3-mm diameter glass beads (10g), sand paper, filter paper, cheesecloth, or blank, that were treated with a 0.1 gram-equivalent wheat extract in hexane. Significantly greater oviposition was observed in Petri dishes with glass beads. In an another experiment, two-choice bioassays were conducted in 4.3 L plastic boxes with two 'food dishes', each containing 10g glass beads. Eight different concentrations of walnut oil viz. 0 mg, 0.05 mg, 0.1 mg, 0.25 mg, 0.5 mg, 0.75 mg, 1 mg, and 10 mg, were tested separately versus a control. Results showed that *P. interpunctella* females laid significantly greater percentage of eggs in 'food dishes' applied with 0.05 mg and 0.25 mg walnut oil. Two-choice bioassays with walnut oil fractions on a chromatographic plate extracted in ether showed that 'food dishes' with slightly polar compounds received significantly greater oviposition. Our experimental results suggest that both physical and chemical cues are involved in *P. interpunctella* oviposition. Identification of *P. interpunctella* attractant components in walnut oil would help meet the larger goal of devising traps that attract gravid females and thereby greatly reduce *P. interpunctella* populations.

SO-06: Douglas Jones and Kristopher Giles. Oklahoma State University.

Integrating Effects of Natural Enemies into Winter Wheat Greenbug Management.

Presence/absence (sequential binomial) sampling methods have been developed that can provide quick and easy estimates of both greenbug and parasitoid densities in the wheat field. Specifically these methods were designated "Glance 'n go" and "Glance 'n go for parasites" respectively. These sampling methods were evaluated over the 2003-2004 growing season in 10 cooperators supplied wheat fields. In each field four 30 x 30 m plots were established. Each plot randomly received one of four common management treatments: 1. Glance 'n go (sequential binomial sampling for greenbug densities), 2. Glance 'n go for parasitoids (sequential binomial sampling for both greenbug and their parasitoid densities), 3. Frequent insecticide applications, 4. No insecticide applications. There were no significant differences in the grain yield for each of the management practices. However a trend could be detected. Glance 'n go had the highest mean yield followed by Glance 'n go for parasitoids, then the sprayed fields and the poorest mean yield was the non-sprayed plots. This is counter-intuitive since we would have expected a very poor yield for the no insecticide application plots until one considers that the parasitoids were able to move freely from plot to plot and effectively eliminated the aphid infestation from the no insecticide application plots. This research indicates that Glance 'n go and Glance 'n go for parasitoids management practices result in grain yields that are larger, though not statistically significant, than an prophylactic insecticide management practice. They are simple to apply and should save the wheat producer money since the producer will no longer make unnecessary insecticide applications.

SUBMITTED POSTERS

P-05: Scott Bundy, Paul Smith and David Richman. New Mexico State University

The Spiders of Cotton in New Mexico

The relative abundance of spiders was evaluated among six large fields of cotton (conventional Acala, Bt Acala, conventional Pima, and organic Pima) over two years in New Mexico. Spiders were collected both from the foliage and from the ground. Forty-two genera of spiders in nineteen families were identified. The most abundant spiders collected were wolf spiders, sheetweb spiders, crab spiders, ghost spiders, and meshweb weavers. The most common spider collected overall during this study was *Pardosa sternalis*.

P-08: J. Reinert, J. Read, J. McCoy, J. Heitholt and R. Bauernfein, Texas A&M University.

Susceptibility of *Poa* spp. to Bluegrass Billbug, *Sphenophorus parvulus*.

The bluegrass billbug (*Sphenophorus parvulus* Gyllenhal) is a major pest of Kentucky bluegrass (*Poa pratensis* L.). However, there is no information on the susceptibility of Texas bluegrass (*P. arachnifera* Torr.) or hybrid crosses with Kentucky bluegrass. This experiment compared the susceptibility of two *P. arachnifera* genotypes with two *P. pratensis* genotypes and five F1 hybrids among the tested parents. The hybrid, 'Reveille', exhibited a level of tolerance to bluegrass billbug larval damage and ranked in the top statistical grouping for least leaf-firing, reduction in tiller number and longest tiller, number and length of rhizomes, and reduction in total dry weight of plants (<30%). The hybrid, TXKY96-66-22, sustained 77% reduction in total dry weight and was the most damaged genotype in the study. No single parameter stood out as being the best for measuring the effect of bluegrass billbug on the *Poa* genotypes evaluated. These results show that *P. arachnifera* and its hybrid crosses with *P. pratensis* have individual plants that are both resistant and susceptible. This paper provides the first report of *P. arachnifera* susceptibility to bluegrass billbug.

P-09: R. Bowling and R. Bowling. West Texas A&M University.

Monitoring Adult Activity by Nantucket Pine Tip Moth and Evaluation of Bayer Advanced Tree and Shrub Insect Control for Their Suppression.

Trecé Inc. (Adair, OK) wing traps and pheromones were used to monitor activity of adult Nantucket pine tip moth (NPTM), *Rhyacionia frustrana* (Comstock) at three locations in Moore and Sherman counties. Initial adult activity was detected in mid-March at all locations and adults were collected in traps through November. Bayer Advanced Tree and

Shrub Insect Control (clothianidin) was compared with a foliar insecticide application and non-treated trees to determine efficacy of this systemic insecticide against NPTM. Numbers of live pupae per Ponderosa pine, *Pinus ponderosa* Dougl. ex Laws., were similar among trees treated with Bayer Advanced Tree and Shrub Insect Control and acephate. However, 98% fewer viable pupae per pine were found on trees treated with Bayer Advanced Tree and Shrub Insect Control compared with nontreated trees. Results suggested that Bayer Advanced Tree and Shrub Insect Control provided suppression of NPTM similar to that of well-timed application of insecticide to foliage.

P-11: Allen Knutson. Texas A&M University.

Identifying Resistance to Cotton Fleahopper in Cotton

In 2003, the cotton fleahopper ranked as the second most damaging insect pest in Texas, accounting for \$18 million in losses and second only to bollworm/budworm. Insecticides are the only control option. We screened 116 converted race stocks from Mexico and Guatemala for resistance to cotton fleahopper damage to small squares. Square damage ranged from 31-79%, indicating the potential to identify host plant resistance to cotton fleahopper.

P-13: Fay Mayer. Texas Tech University.

Importance of Genetic Relationships Among Cave Crickets (Rhaphidophoridae: *Ceuthophilus*) from Guadalupe Escarpment Caves

Rhaphidophorid crickets are essential components of healthy cave ecosystems. As key members, their genetic relationships have great potential to provide useful information about the biotic and abiotic aspects of cave environments. This work elaborates on how genetic relationships among cave crickets can contribute to the knowledge base of Guadalupe Escarpment Caves.

P-14: Andrew Chen, H. He and Ronald Davey. USDA-ARS-SIMRU.

Amitraz Resistance In The Southern Cattle Tick

The mode of action of amitraz is thought to be its toxic effects on a receptor for a neuromodulator, octopamine. Resistance could arise from modifications of this receptor so that it would not be affected by amitraz. A putative octopamine receptor cDNA was cloned and sequenced from a cattle tick in Australia. However, when the sequence was compared between Australian strains of amitraz-susceptible and resistant ticks, no differences were detected. We have sequenced this putative octopamine receptor gene in tick strains from America. The American ticks have a sequence almost identical to that of the Australian ticks. In a Brazilian strain, the Santa Luiza strain that is very resistant to amitraz, there are two nucleotide substitutions that result in amino acids different from the susceptible strain. Further study is underway to determine whether these substitutions are responsible for amitraz resistance.

P-15: Y. Li, T. Liu, Texas Agricultural Experiment Station and S. Greenberg, USDA-ARS, KGSA

Effects of Bt-cotton (Bollgard II), Non-Bt Cotton and Cabbage on Fifth Instar Cabbage Looper

The survival rate, developmental time and the pupae weight of cabbage looper, *Trichoplusia ni* (Hübner), were determined in the laboratory after the 5th instars (2 d after molting) were fed with Bollgard II cotton, non-Bt cotton (DPL491), cabbage or nothing. Larval survival or pupation rate was lowest when the larvae fed Bollgard II cotton (51.6%), followed by the ones fed nothing (61.5%), non-Bt cotton (80.0%), and were highest when the larvae fed cabbage (100%). Developmental time from the 5th instars to pupation was longest for the larvae fed non-Bt cotton (5.8 d), followed by those fed nothing (2.5 d) and Bollgard II (2.8 d), and those fed cabbage, the shortest (2.1 d). The pupae from the larvae fed cabbage were 1.8-, 1.3-, and 1.9-fold heavier than those fed Bollgard II cotton, non-Bt cotton or nothing. All pupae developed into adults when their larvae fed cabbage, whereas 66-90% pupae developed to adults when their larvae fed Bollgard II cotton, non-Bt cotton, and nothing, respectively.

P-16: Michael Pendleton, Texas A&M University and Bonnie B. Pendleton, West Texas A&M University

Relationship Between Morphology of Cowpea Grain and Resistance to Cowpea Weevil (Coleoptera: Bruchidae)

The cowpea weevil, *Callosobruchus maculatus* (F.), infests cowpea, *Vigna unguiculata* (L.), grain in the field and storage. Eggs are attached to the outer surface of a grain, and larvae develop inside. After pupation, the adult emerges through a transparent covering the larva leaves in the grain. Cowpea weevils can damage 100% of stored grain, resulting in 60% weight loss. Emphasis has been on identification and development of resistant cowpeas to reduce agricultural risk, especially in Africa. The objective of this research was to compare the amount of damage caused by cowpea weevil to morphological traits of the surface of cowpea grains. Twenty varieties of cowpeas were evaluated for resistance. Five newly emerged cowpea weevils were put with 10 g of grain in each of 10 vials of a variety. Grains in the vials were evaluated every three weeks for five times (105 days total). The most resistant varieties were infested with significantly fewest eggs per gram of grain (44.4 for Tx158BE versus 117.7 for Tx139crm). More than twice as many adult cowpea weevils were produced per gram of grain of Tx139crm (21.8) as Tx126BE (10.6). Grain of Tx139crm weighed only 3.5 g per vial, 65% less, at 105 days after infestation. Grain of moderately resistant Tx126BE and Tx158BE weighed significantly more, 6.6 and 6.5 g per vial. Weight loss of cowpea grain per vial was negatively correlated to the cumulative numbers of cowpea weevil eggs and adults produced per gram of grain and score of damage to the grain. No variety of cowpea was very resistant to cowpea weevils.

A razor blade and small hammer were used to split six varieties of nondamaged dry cowpea grains along the boundary between the cotyledons. The split grains were exposed to osmium vapor overnight and coated with gold-palladium by using a Hummer sputter coater. The grain surface and cross-section of the seed coat were observed by using a JEOL JSM 6400 SEM at 15 KeV, 12-mm working distances, and magnifications of 500 to 2,000 x. Cross sections of the seed coats of the different varieties of cowpeas differed in appearance. In general, fewer cracks and fissures were found in cross sections of the palisade layer of malpighian cells of seed coats of more resistant varieties of cowpeas than of more susceptible varieties. The research was supported by the Instituto Nacional de Investigacao Agronomica de Mozambique (INIA) and by the International Sorghum and Millet Collaborative Research Support Program (INTSORMIL CRSP) sponsored by the U.S. Agency for International Development.

P-17: Michael Pendleton, Texas A&M University and Bonnie B. Pendleton, West Texas A&M University.

Comparison of Morphology of Sorghum Grain to Resistance to Maize Weevil (Coleoptera: Curculionidae)

Scanning electron and light microscopy were used to compare the morphology of the seedcoat of 20 genotypes of sorghum, *Sorghum bicolor* (L.) Moench, and resistance of stored sorghum grain to maize weevil, *Sitophilus zeamais* Motschulsky. The maize weevil is one of most damaging insect pests of stored grain. Maize weevils infest kernels in the field and are taken into storage. A maize weevil deposits 300 to 400 eggs into cavities she chews in kernels. The larva feeds inside and damages the kernel. Five newly emerged maize weevils were put with 5 g of grain in each of 10 vials of each kind of sorghum. Vials of each kind of sorghum were sequentially set up and evaluated every three weeks for a total of 105 days. Each day, each grain in the 10 vials of one kind of sorghum was evaluated for damage, numbers of live and dead weevil adults were counted, and the grain in each vial was weighed. Eight times fewer maize weevil adults emerged from Sima, Macia, and Sureno (1.7, 2.8, and 3.1 per gram of grain, respectively) as from CE151, SC630-11E11, or ATx631 at 105 days after infestation. Of the original 5.0 g of grain per vial, grain of Sureno, Sima, and Macia weighed significantly more at 105 days after infestation – 0.8, 3.8, and 5.4% weight loss, respectively. Grain of SC630-11E11 weighed 46.8% less at 105 days after infestation. The more resistant genotypes tended to have thicker seed coats when compared to the most susceptible sorghums. Differences were noted in the thickness of the cell layers, kind of cell layers present, and arrangement of cells within each cell layer. Scanning electron microscope photographs were obtained by using a JEOL JSM-6400 scanning electron microscope using 15 KeV, a working distance of 7 mm, and magnifications to 6,000x. Light microscope photographs were obtained by using brightfield illumination with a Zeiss Axiophot compound microscope with magnification to 600x. The research was supported by the Instituto Nacional de Investigacao Agronomica de Mozambique (INIA) and by the International Sorghum and Millet Collaborative Research Support Program (INTSORMIL CRSP) sponsored by the U.S. Agency for International Development.

P-18: T. Liu. Texas Agricultural Experiment Station.

**Biology and Life history of the Great Southern White (*Ascia monuste monuste*)
(Lepidoptera: Pieridae) on Cabbage**

Ascia monuste (L.), commonly called as the great southern white, is a subtropical and tropical species with several subspecies and forms. The subspecies, *A. monuste monuste* (L.), is distributed in Texas and other southern states of the US. In recent years, it becomes a sporadic pest insect of crucifer vegetables in south Texas. In some isolated fields, the gregarious larvae could have completely eaten everything (leaves, petioles and stems) above ground of a large cabbage or collard plant. To understand more about this subspecies as a pest, we studied the biology of this species, including development of all immature stages, longevity of the adults, and some other parameters of all stages in the laboratory and greenhouses on cabbage. Developmental time was averaged 4.7, 2.8, 2.3, 3.1, 3.2, and 6.0 d for eggs, 1st, 2nd, 3rd, 4th, 5th instars, and pupae, respectively, with an average of 17.4 d for all larvae stages, an average of 31.7 d from oviposition to adult emergence for both sexes. Adult longevities averaged 18.3 d for both sexes, 19.8 d for females, and 16.3 d for males. The sex ratio was 1:0.76 (females : males) or 56.8% females. Each egg cluster has an average of 43.2 eggs with a range of 1 to 245. Body lengths and head capsule widths for all five instars are well correlated with an r-value of 0.9832. Based on the data from this study, we concluded that the life history parameters of the subspecies, *A. monuste monuste*, are different from those of *A. monuste orseis* (Godard), a neotropical subspecies.

**P-19: Robert Bowling, Texas Cooperative Extension Service and Roxanne Bowling,
West Texas A&M University**

**Efficacy of YieldGard® CRW, YieldGard® Plus and Poncho® 1250
Against Western Corn Rootworm and Corn Borer.**

Monsanto's rootworm corn event MON863 (YieldGard® Rootworm and YieldGard Plus) and Gustafson's seed treatment, Poncho® 1250 (clothianidin, 1.25 mg ai/seed), were evaluated for efficacy against the western corn rootworm, *Diabrotica virgifera virgifera* LeConte, in a large-plot, replicated field study. Assessments included root damage by using the Iowa State node-injury scale, plant height, and yield. Damage to roots of YieldGard Rootworm, YieldGard Plus, and Poncho 1250 corn was 99, 95, and 73% less, respectively, when compared with the nontreated check. Corn rootworm transgenic and insecticide-protected plants were 1.2 times taller than non-treated plants. YieldGard Plus and Poncho 1250 corn yielded 26.8 and 24.6 bushels more per acre, respectively, than the non-treated check. These technologies provided excellent to satisfactory protection from root damage caused by western corn rootworm and offered yield advantages above trait access fees or technology costs.

P-22: Mustafa Mirik, G. Michels, Texas Agricultural Experiment Station, Norman Elliott, USDA-ARS, S. Kassymzhanova-Mirik, Texas Agricultural Experiment Station and V. Catana, Oklahoma State University.

Ground-Based Remote Sensing for Aphid-Induced Stress and Aphid Density Estimation in Wheat in Field Conditions.

We studied the usefulness of digital image analysis and spectral reflectance data to quantify and predict aphid-feeding damage in winter wheat (*Triticum aestivum* L.) fields in Oklahoma and Texas. Spectral reflectance data and digital images were collected in four fields in the fall of 2003. A multispectral ground radiometer and a hyperspectral walking spectrometer were used to gather reflectance data, and a digital camera was used to acquire images over 0.25 m² damaged-wheat plots. Damage was caused by greenbug, *Schizaphis graminum* Rondani, and bird cherry-oat aphid, *Rhopalosiphum padi* Linnaeus feeding in all fields. Various spectral vegetation indices were calculated from the reflectance data and a regression technique was performed to investigate the best relationships between the percentage aphid-feeding damage and the spectral vegetation indices. The mean percentage aphid-feeding damage estimated by digital image analysis ranged from 10.61 to 45.64 for all fields. The amount of variability in spectral vegetation indices derived from hyperspectral reflectance data that were explained by the percentage aphid-feeding damage were 79%, 76%, 85%, and 68% for the data collected in fields one, two, three, and four, respectively. The proportions of variation in vegetation indices derived from multispectral reflectance data attributable to the percentage aphid-feeding damage in wheat were 83%, 38%, 48% for the data gathered in fields two, three, and four, respectively. Our results suggest that spectral reflectance and digital image data can be successfully used to estimate the percentage aphid-feeding damage in wheat fields with an acceptable degree of accuracy.

P-23: Mustafa Mirik, G. Michels, S. Kassymzhanova-Mirik, Texas Agricultural Experiment Station, Norman Elliott, USDA-ARS and V. Catana, Oklahoma State University

An Aphid (Homoptera:Aphididae) Damage Quantification Method in Winter Wheat Using Digital Image Analysis and Spectral Reflectance Data.

This work was carried out to investigate the relationship between remotely sensed data and aphid density in field conditions. A hyperspectral ground spectrometer was used to collect percent reflectance data over 0.25 m² aphid stressed and non-stressed wheat (*Triticum aestivum* L.) plots in the fields located in Texas, Oklahoma, and Colorado. Bird-cherry oat aphid (BCOA) (*Rhopalosiphum padi* Linnaeus), greenbug (GB) (*Schizaphis graminum* Rondani), and Russian wheat aphid (RWA) (*Diuraphis noxia*) were counted in each of the 0.25 m² aphid stressed wheat plots. Paired t-test indicated that percent reflectance values in the 400-900 nm region of the spectrum from aphid stressed and non-stressed wheat were statistically significant. In addition to the statistical comparison of percent reflectance, a total of 25 spectral vegetation indices were calculated from the reflectance data and regressed against the number of aphids. A wide array of

relationships was found between spectral reflectance and aphid density. For example, the R2 values were 0.85 for GB plus BCOA and 0.97 for RWA. These preliminary results indicated that remote sensing techniques, both hyperspectral and multispectral imageries, are promising to predict aphid density and discriminate aphid-induced stress from uninfested wheat in field conditions.

P-24. Robert Bowling, Texas Cooperative Extension Service, Roxanne Bowling and Bonnie Pendleton, West Texas A&M University

**Response by Fall Armyworm and Western Bean Cutworm
(Lepidoptera: Noctuidae) Larvae Presented Corn Event TC1507.**

Response by fall armyworm (FAW), *Spodoptera frugiperda* (J. E. Smith), corn earworm (CEW), *Helicoverpa zea* (Boddie), and western bean cutworm (WBC), *Richia albicosta* (Smith), presented Pioneer's transgenic corn event TC1507 (Herculex® I) was assessed in replicated small plots in the field. The Davis scale (0-9) was used to assess damage by FAW to foliage. Damage by larvae feeding on Herculex I plants was compared with that on non-Bt plants. Damage by first, second, third and fourth instar FAW on transgenic plants was reduced by 87, 52, 33, and 27% compared with damage to non-Bt corn. Natural populations of CEW and WBC on ears of Herculex I and non-Bt corn were determined by counting the number of each species on corn ears. There were 58% fewer larvae of both species on ears of Herculex I corn than on ears of non-Bt corn. Specifically, abundance of CEW and WBC on ears of Herculex I corn was 71 and 47% less than on ears of non-Bt corn. Results indicate that the Herculex I event suppresses a broader spectrum of lepidopteran species compared with other commercially available corn events.

P-25: Roxanne Bowling, Bonnie Pendleton, West Texas A&M University, Robert Bowling, Texas Cooperative Extension Service and G. Michels, Texas Agricultural Experiment Station.

**Alternatives to Organophosphates and Carbamates for
Managing Aphids in Wheat and Sorghum**

As water becomes scarce, many corn farmers will change to more water-use efficient crops such as sorghum and wheat. The major insect pest of both crops is the greenbug. Greenbugs cost wheat farmers \$250 million and sorghum farmers \$126 million annually in crop losses and insecticides (USDA-ARS). The only foliar insecticides for aphids in wheat and sorghum are broad-spectrum organophosphates and carbamates. Implementation of the 1996 Food Quality Protection Act (FQPA) will result in the need for alternate controls for greenbug. Research will examine interactions of two non-chemical control strategies, plant resistance and biological control, using modifications to a practical, well-developed system based on wheat, sorghum, greenbugs, and a predaceous lady beetle. This project will develop and demonstrate practical and environmentally sound strategies to help end-users, wheat and sorghum farmers, reduce reliance on broad-spectrum insecticides. Specific objectives were to develop and demonstrate the need for conservation of

beneficial insects and plant resistance, and demonstrate viable integrated pest management options for wheat and sorghum agroecosystems. Applied on-farm and University Experiment Station demonstrations are being used to educate farmers about alternative greenbug control methods. First year study results will be discussed.

P-27: Vasile Catana, Oklahoma State University, N. Elliott, USDA-ARS, K. Giles and M. Phoofolo, Oklahoma State University

Dynamics of Aphid Populations on Wheat in Oklahoma

Using a series of several sampling methods on aphid populations and their predators and parasitoids in four different places in Oklahoma for the duration of three years it was accumulated an important volume of data. Direct statistical analysis of these data did not show a strong link between aphid density and their predators and parasitoids that in specific circumstances can be considered as an important regulator factor for these pests. A transformation of the initial dataset was applied and as result it was constructed a linear regression that can describe the evolution of aphid population in time. This simple model takes into account the predator density and some weather factors. The values of regression coefficients have biological sense and it can be also used for short term prediction.

SUBMITTED ORAL PRESENTATIONS

O-01: C. Bogran and S. Thompson. Texas A&M University.

Biology and Management of Agave Weevil, *Scyphophorus acupunctatus*

The Agave weevil, *Scyphophorus acupunctatus* Gyllenhal (also known as sisal weevil) has become an important pest of ornamental Agave and *Yucca* spp. in Texas nurseries and landscapes. It is also one of the major pests of agave tequilero (*Agave tequilana*) in Jalisco, Mexico. It is widely distributed from southwestern United States to the Caribbean, Central America and northern South America. Adults tunnel into the stem where they feed on tender tissue. Eggs are laid inside the tunnels and larvae bore into the crown of the plant. Larvae pupate within the roots. The weevil is associated with several microorganisms including plant pathogenic bacteria (*Erwinia* sp.) which cause plant dieback. A test was conducted in a commercial nursery operation to assess effectiveness of three systemic insecticides in protecting un-infested plants. Treatments included Acephate, Imidacloprid + Cyfluthrin, Dimethoate at labeled rates, and an untreated control. Each treatment was assigned to four groups of 20 plants (in 1 gallon pots) in a completely randomized block design. All treatments reduced infestation levels relative to the control at 40 days after treatment, but no significant differences were found among insecticides. Upon initial detection of adult activity, a single application of a systemic insecticide may be enough to minimize plant losses.

O-02: David Thompson and Scott Bundy. New Mexico State University.

Assassin Bugs as Predators of Newly Introduced Saltcedar Leaf Beetles.

Saltcedar leaf beetles (*Diorhabda elongata*) were recently introduced to control saltcedar (*Tamarix* spp.) at numerous locations in the western United States. Several predators have been found attacking the developing populations of leaf beetles. This study explores the influence that two species of assassin bugs, *Zelus renardii* and *Z. tetracanthus*, could have on the developmental rates of saltcedar leaf beetles. Adult and 5th instar assassin bugs were collected from saltcedar trees at the leaf beetle release sites and used in laboratory studies to quantify the number of leaf beetle larvae and adults consumed in 24 hours. Female assassin bugs consumed almost twice as much as males. Large populations of assassin bugs will significantly slow the development and biological control potential of saltcedar leaf beetles.

O-04: Allen Knutson, Texas A&M University.

Release of *Diorhabda elongata* for Biological Control of Saltcedar in Texas.

The leaf beetle, *Diorhabda elongata* (Chrysomelidae), was released in the field at three sites in west Texas in 2003. A field population established during the summer at one site increased to sufficient numbers to defoliate several saltcedar trees in the fall of 2004. Field

cage studies were conducted at other sites in south and far west Texas to determine adaptability of *Diorhabda* from different regions of the world. Egg predation by Coccinelidae, larval predation by assassin bugs and spiders, and dispersal of adults are potential constraints to beetle establishment and detection following open field releases.

O-05: Vanessa Carney, G. J. Michels, Jr., Texas Agricultural Experiment Station, B. L. Castleberry, USDA-ARS, CPRL.

Beetles Find New Home in the Texas Panhandle: Release of *Diorhabda elongata* on a Saltcedar Invasion Along the Canadian River.

The consequences of saltcedar (*Tamarix spp.*) invasion into the western riparian areas of the United States are measured both in economic losses and ecological damage to areas that can scarcely afford to lose valuable water resources. A biological control program for saltcedar was deemed necessary and initiated in 1997 utilizing various ecotypes of the defoliator *Diorhabda elongata* (Coleoptera: Chrysomelidae). Near Lake Meredith, Texas, a population of *D. elongata* originating from Posidi, Greece was released into cages in 2004, marking the first attempt to establish this ecotype in northern Texas. Data collection in 2004 included baseline surveys on saltcedar population densities and plant community structure near the area of beetle release. A general summary of observations made on beetle establishment population growth during the first field season are also presented.

O-08: Tracey Carrillo and Joe Ellington, New Mexico State University.

**Associations of Normalized Difference Vegetative Index (NDVI),
Arthropod Density, Plant Architecture and Agronomic Diversity In Acala 1517
Cotton**

A one year study conducted at New Mexico State University Agricultural Experiment Station at the Leyendecker Research Center evaluated a rapid response system that involved using a tool that measures infrared radiation reflectance, calculates NDVI and provides an index number. This data can be correlated to nutrient responses, water deficits, and plant architecture. The tool used to capture NDVI readings is was the GreenSeeker[®]. A research version of the device was used weekly to collect NDVI data from Acala 1517 cotton at the plant science center. Data analysis showed a significant difference among treatments of water/nutrient deficits and correlated arthropod density and fruiting structures were associated with each treatment. Environmental plant responses (plant architecture) were affected by changes in soil moisture, nitrogen, and radiation.

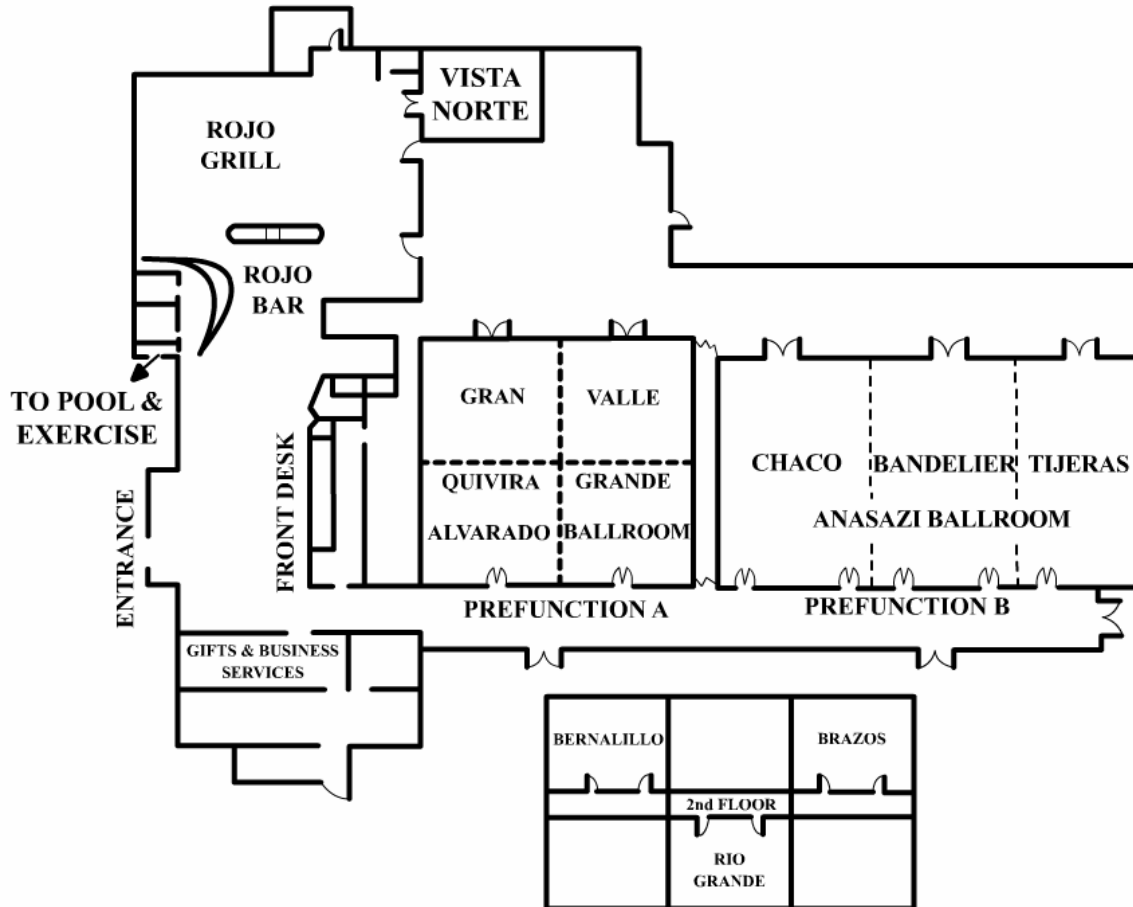
O-09: Joe Ellington and Tracey Carrillo. New Mexico State University.

Long-Term Perspectives for Biological Control in Field Crops

Approximately 100,000 acres of cotton are planted annually in California, Arizona, and New Mexico, depending on production conditions and profit. Growing conditions within and between these states can differ dramatically; however, except for the San Joaquin valley and some other parts of California, boll weevil, *Anthonomus grandis*, and pink bollworm, *Pectinophora gossypiella*, have been key pests which have driven insecticide use. Boll weevil has essentially been eradicated in Arizona and most of New Mexico and pink bollworm eradication programs are in place in New Mexico, Texas and northern Mexico. It is probable Arizona will initiate a pink bollworm eradication program in the near future. With the eradication of these key pests from most of the cotton in the Southwest, attention can be paid to secondary insect pests. In New Mexico, these are bollworm, *Helicoverpa zea*; lygus, *Lygus* spp.; cotton aphid, *Aphis gossypii*; cowpea aphid, *A. craccivora*; green peach aphid, *Myzus persicae* and silverleaf whitefly, *Bemisia argentifolii*. Populations of these insects are, in the vast majority of cases, controlled by beneficial insects in New Mexico. Further density reductions can be made with proper cultural practices, i.e. avoiding luxury consumption of N₂ and water (Leigh 1996, Altieri and Nicholls 2003, and Ellington et al. 1984c). Transgenic, insect resistant cottons are presently widely grown in the Southwest. Although they control several lepidopteran pests, without overtly disturbing the environment, and they often don't require further insect control management beyond planting the seed, they do require a technology fee, may build resistance in insect populations, require the use of nonadapted varieties and commit growers to a one-size-fits-all production strategy. Locally adapted Acala and Pima varieties in New Mexico are higher quality, higher yielding and they demand a higher selling price than commercial transgenic varieties currently available. We have three organic cotton growers in New Mexico who have maintained good yields over the years and bumper yields in 2002, due to reduced pink bollworm densities. These growers currently produce about 500 acres of organic cotton annually. Preserving locally adapted varieties gives our growers the latitude of switching varieties, production practices and insect control strategies, depending on growing conditions and market demands (a real advantage in a highly variable market). Water is a crucial resource in western agriculture. Cotton requires less water than some other commonly grown crops and therefore acreages are expected to increase in the future; however, growers have become accustomed to producing cotton using luxury amounts of water and N₂ and holding growth back with plant growth regulators. Not only does this practice waste water, N₂ and growth regulators, but invasive insect populations are attracted to these lush fields, or parts of fields. There is a need to determine the timing, the amount of water, growth regulators, N₂ and the insect control strategies needed to generate profit under limited water conditions.

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53rd ANNUAL MEETING SWB ESA



**Floor plan of Wyndham Hotel Convention Rooms
Albuquerque, New Mexico**