55th ANNUAL MEETING
of the
SOUTHWESTERN BRANCH
of the
ENTOMOLOGICAL SOCIETY OF AMERICA

http://swbesa.tamu.edu

and the

ANNUAL MEETING of the
SOCIETY OF SOUTHWESTERN ENTOMOLOGISTS

19-22 FEBRUARY 2007
Omni Hotel Marina Tower
707 North Shoreline Blvd.
Corpus Christi, TX 78401
(361)-887-1600; www.omnihotels.com

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SPONSORS

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

Trece Inc. **Bayer Environmental Science** **Dr. David Pledger**

DuPont Crop Protection **Coastal Bend Pest Control Association**

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:

	Full meeting	One day only	Banquet only
Active SWB or SSWE member	$130	$50	$30
Student SWB or SSWE member*	50	25	30
Non-member	150	65	30
Youth member	10	10	10
Spouse/Guest	40	20	30
Honorary/Emeritus	Gratis**	Gratis	Gratis

*Student SWB or SSWE members: the fee is $ 5.00 if you are a volunteer helper at the meeting.
**Gratis, but please register.

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, and continental breakfast and breaks.

AUDIOVISUAL:

ONLY digital projectors with computers will be provided for oral presentations. Please bring your Power Point files on **CD or "jump drive" only** to the Presentation Collection Desk **at least 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 Collection desk, Riviera Foyer. 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.

JOB OPPORTUNITY AREA:

The Student Affairs Committee of the SWB-ESA has a list of Job Opportunities (Padre A-C) 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 the Marina View Room. **Extra tickets** may be purchased for **$30** at the Registration Desk.

BANQUET MENU:

Grilled Chicken with Burgundy Mushroom Sauce

Rosemary Fused Mashed Potatoes

Served with Chef's Choice Mixed Vegetable Salad with Ranch Dressing

Fresh Dinner Rolls

Cheese Cake with Caramel Sauce

Iced Tea and Coffee

PROGRAM SUMMARY

MONDAY, FEBRUARY 19, 2007

Southwestern Branch-ESA Executive Committee Meeting Location: Riviera 3-5	1:00 – 3:00 PM
Society of Southwestern Entomologists - Executive Committee Meeting Location: Riviera 3-5	3:00 – 4:00 PM
Society of Southwestern Entomologists – Members' Meeting Location: Riviera 3-5	4:00 – 5:00 PM
Registration for SWB-ESA meeting Location: Riviera Foyer	1:00 – 7:00 PM
Linnaean games Location: Riviera 1-2	7:00 – 9:00 PM

TUESDAY, FEBRUARY 20, 2007

Registration for SWB-ESA meeting Location: Riviera Foyer	7:00 AM – 6:30 PM
Poster Set Up **--- Note:** All student and regular members' posters will be on display Tuesday and Wednesday Location: Padre A-C	7:00 – 8:00 AM
Students – Stand by your posters to answer questions Location: Padre A-C	During Breaks
Continental Breakfast Location: Padre A-C	7:30 – 8:30 AM
Poster Viewing Location: Padre A-C	8:00 AM – 5:00 PM
Job Opportunities Location: Padre A-C	8:00 AM – 5:00 PM
Presentation Collection Area Location: Riviera Foyer	8:00 AM – 5:00 PM
Plenary Session Location: Riviera 3-5	8:00 – 9:30 AM
Break (Padre A-C)	9:30 – 9:45 AM
Student competition – Oral Presentations	

TUESDAY, FEBRUARY 20, 2007

Location: Riviera 3-5	9:45 AM – 12:21 PM
LUNCH—on your own	12:21 – 1:30 PM
Invited Symposium Concurrent Sessions	2:15 – 5:00 PM
Symposium: Cross-commodity Resistance Management Research and Implementation Location: Riviera 1-2	2:15 – 4:40 PM
Symposium: Mexican Fruit Fly Quarantine: Using IPM and Technology to Keep It Out of the USA Location: Riviera 3-5	2:15 – 5:00 PM
Break (Padre A-C)	3:00 – 3:20 PM
Linnaean games Round II Location: Riviera 1-2	5:00 – 7:00 PM
Banquet & Awards Location: Marina View Room	7:00 – 9:00 PM

WEDNESDAY, FEBRUARY 21, 2007

Continental Breakfast Location: Padre A-C	7:30 – 8:30 AM
Symposium and Submitted Papers Concurrent Sessions	8:00 AM – 4:40 PM
Symposium: Pierce's Disease: Impacts on Texas Agriculture Location: Riviera 3-5	8:00 – 11:40 AM
Break (Padre A-C)	9:40 – 10:00 AM
Submitted Papers: Crop Protection Location: Riviera 1-2	8:00 – 9:40 AM
Break (Padre A-C)	9:40 – 10:00 AM
Submitted Papers: Crop Protection Location: Riviera 1-2	10:00 – 10:48 AM
Submitted Papers: Physiology/Toxicology/Biochemistry/Molecular Location: Riviera 1-2	10:48 – 11:00 AM
Submitted Papers: Biological Control Location: Riviera 1-2	11:00 – 11:48 AM
Submitted Papers: Biology/Ecology/Behavior	

WEDNESDAY, FEBRUARY 21, 2007

Location: Riviera 1-2	11:48 –12:00 AM
LUNCH—on your own	11:40 AM – 1:00 PM
Symposium: Urban Entomology and Outreach Program Location: Riviera 3-5	1:00 – 4:40 PM
Break (Padre A-C)	2:40 – 3:00 PM
Submitted Papers: Biology/Ecology/Behavior Location: Riviera 1-2	1:00 – 1:36 PM
Submitted Papers: Urban / Other Location: Riviera 1-2	1:36 – 2:00 PM
Submitted Papers: Regulatory / Extension Location: Riviera 1-2	2:00 – 2:24 PM
Submitted Papers: Medical / Veterinary Location: Riviera 1-2	2:24 – 2:36 PM
Break (Padre A-C)	2:40 – 3:00 PM
Remove posters –	5:00 – 7:00 PM
Final Business Meeting – SW Branch ESA Location: Riviera 3-5	5:00 – 7:00PM
Student Mixer Location: Marina View	7:00 – 8:00PM
General Members' Mixer Location: Marina View	8:00 – 9:00PM
Dinner on your own	

THURSDAY, FEBRUARY 22, 2007

Insect Expo Location: Corpus Christi Museum of Science and History	8:00AM – 2:00 PM
SW Branch ESA Executive Committee, Final Meeting Location: Monty's Boardroom	3:00 – 4:00 PM

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FULL PROGRAM

MONDAY, FEBRUARY 19, 2007

Southwestern Branch-ESA Executive Committee Meeting Location: Riviera 3-5	1:00 – 3:00 PM
Registration for SWB-ESA meeting Location: Riviera Foyer	1:00 – 7:00 PM
Society of Southwestern Entomologists - Executive Committee Meeting Location: Riviera 3-5	3:00 – 4:00 PM
Society Southwestern Entomologists – Members' Meeting Location: Riviera 3-5	4:00 – 5:00 PM
Linnaean games – Preliminary Rounds Location: Riviera 1-2	7:00 – 9:00 PM

TUESDAY, FEBRUARY 20, 2007

Registration for SWB-ESA meeting Location: Riviera Foyer	7:00 AM – 6:30 PM
Poster Set Up---**NOTE**: All student posters and all regular member posters will be on display Tuesday AND Wednesday Location: Padre A-C	7:00 – 8:00 AM
Poster Viewing Location: Padre A-C	8:00 AM Tuesday and continued through Wednesday
Job Opportunity Area Location: Padre A-C	8:00 AM – 5:00 PM
Presentation Preview- Presentation Collection Area Location: Riviera Foyer	8:00 AM – 5:00 PM

TUESDAY, FEBRUARY 20, 2007

Plenary Session

Location: Riviera 3-5 8:00 – 9:30 AM

Call to Order – **David Thompson**, President, Southwestern Branch of the ESA

Welcome – **Mayor Garrett**, Mayor of Corpus Christi

Remarks from ESA President – **Scott Hutchins**, President, Entomological Society of America

ESA Foundation Report – **Frank Gilstrap,** Past-President, Entomological Society of America

What's going on at ESA Headquarters – **Chris Stelzig**, Director of Membership and Marketing Entomological Society of America

ESA Governing Board Report – **Marvin Harris**, ESA Governing Board Representative

Necrology Report – **Phil Mulder**, Necrology Committee

Greetings from the Society of Southwestern Entomologists – **Bonnie Pendleton**, President

Board Certified Entomologists – **Bart Drees**, BCE Branch Representative

Presidential Address: "Where have we been and where are we going?" "SWB, Past, Present and Future?" – **David Thompson**

Announcements – **Scott Armstrong**, Chair, Program Planning Committee, and **Charles Chilcutt**, Chair, Local Arrangements Committee

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Break Location: Padre A-C 9:30 – 9:45 AM

THANK YOU, SPONSORS!

Students---stand by your posters to answer questions

Location: Padre A-C During Breaks

TUESDAY, FEBRUARY 20, 2007

STUDENT COMPETITION, ORAL PRESENTATIONS

Location: Riviera 3-5

Moderator: Bonnie Pendleton, West Texas A&M University

9:45 AM **SO-01** Feeding injury by Lygus to cotton in New Mexico. **Stacey Bealmear**, New Mexico State University; Scott Bundy, New Mexico State University; Dawn Vanleeuwen, New Mexico State University.

9:57 AM **SO-02** Molecular quantification of *Xylella fastidiosa* cells transmitted by *Homalodisca vitripennis.* **Brian Jackson**, University of Texas; Matt Blua, University of Texas; Blake Bextine, University of Texas.

10:09 AM **SO-03** Temperature effects on glassy-winged sharpshooter trap counts in Texas vineyards. **Danny McDonald**, Texas Agricultural Experiment Station; Isabelle Lauziere, Texas Agricultural Experiment Station; Forrest Mitchell, Texas Agricultural Experiment Station.

10:21 AM **SO-04** Corn leaf aphid fecundity and longevity at different constant temperatures on sorghum. **Shivakumara Bheemappa**, West Texas A&M University; Bonnie Pendleton, West Texas A&M University; Gerald Michels, Texas Agricultural Experimental Station.

10:33 AM **SO-05** Habitat use by robber flies (Diptera: Asilidae) in the Texas Panhandle. **Joy Newton**, West Texas A&M University; Richard Kazmaier, West Texas A&M University; David Sissom, West Texas A&M University.

10:45 AM **SO-06** Pathogenicity screening of Peruvian *Paecilomyces fumosoroseus* isolates against *Bemisia tabaci* B type. **Jorge Achata**, International Potato Center (Peru), and New Mexico State University; Norma Mujica, International Potato Center (Peru); Octavio Zegarra, International Potato Center (Peru); Jurgen Kroschel, International Potato Center (Peru).

10:57 AM **SO-07** Texas Sorghum producer's perception of sorghum midge (Diptera: Cecidomyiidae). **Tebkew Damte**, West Texas A&M University; Bonnie Pendleton, West Texas A&M University.

11:09 AM **SO-08** Mating and transmission of courtship vibrations for the parasitoid wasp, *Cotesia marginiventris*, on five rearing substrates. **Andrea Joyce**, Texas A&M University; R. E. Hunt, Indiana University; S. B. Vinson, Texas A&M University; Julio Bernal, Texas A&M University.

TUESDAY, FEBRUARY 20, 2007

11:21 AM **SO-09** Mosquito oviposition: Does larval experience with predators influence adult oviposition decisions? A preliminary study. **Michelle Sanford**, Texas A&M University; Jimmy Olson, Texas A&M University; Thomas DeWitt, Texas A&M University, Jeffery Tomberlin, Texas Cooperative Extension.

11:33 AM **SO-10** Most susceptible stage of rice panicle development to the rice stink bug (*Oebalus pugnax*). **Luis Espino**, Texas A&M University; M.O.Way, Texas A&M University.

11:45 AM **SO-11** Passive traps for monitoring *Pseudacteon* phorid flies; parasitoids of *Solenopsis* fire ants. **Robert Puckett**, Texas A&M University; Alejandro Calixto, Texas A&M University; Charles Barr, Texas A&M University; Marvin Harris, Texas A&M University.

11:57 AM **SO-12** Ovipositional preference and larval performance of two strains of Indianmeal moth. **Kishan Sambaraju**, Oklahoma State University; Thomas Phillips, Oklahoma State University.

12:09 PM **SO- 13** Interference competition by *Solenopsis invicta* displaces native ants at broadcast baits: implications for management of *S. invicta* and restoration of native ants. **Alejandro Calixto,** Texas A&M University; Marvin Harris, Texas A&M University, and Charles Barr, Texas A&M University.

Lunch---on your own 12:21 – 1:30 PM

Concurrent Sessions: Location Riviera 1-2

Symposium: Cross-commodity resistance management research and implementation
Moderator: Carlos Bográn

2:15 PM Introduction and scope of the symposium. **Carlos Bográn**, Texas Cooperative Extension.

2:20 PM **CR-01** Bt Maize Resistance to Sugarcane Borer and Southwestern Corn Borer, **Boris Castro**, Texas Cooperative Extension.

2:40 PM **CR-02** Bt resistance monitoring for tobacco budworms, **Carlos Blanco**, USDA ARS.

3:00 PM **Break** (Padre A-C)

TUESDAY, FEBRUARY 20, 2007

3:20 PM **CR-03** Modeling *H. zea* resistance evolution on Bt cotton and corn, **Charles Chilcutt,** Texas Agricultural Experiment Station**.**

3:40 PM **CR-04** Boll worm resistance to pyrethroids in TX, **Brad Hopkins** and Patricia Pietrantonio, Texas A&M University, Department of Entomology.

4:00 PM **CR-05** Whitefly resistance to neonicotinoid insecticides in floricultural crops, **Carlos Bográn** & Patricia Pietrantonio, Texas Cooperative Extension, Texas A&M University, Department of Entomology.

4:20 PM **CR-06** Resistance of the Citrus Rust mite to avermectin, **Mamoudou Setamou** and Victor French. Texas A&M Citrus Center Kingsville.

4:40 PM **END**

Concurrent Session: Riviera 3-5

Symposium: Mexican Fruit Fly Quarantine: Using IPM and technology to keep it out of U.S.A.
Moderators: Don Vacek

2:15 PM Introduction and scope of the symposium, **Don Vacek**, USDA, APHIS, PPQ, CPHST.

2:20 PM **MF-01** A system for rapid molecular identification of immature *Anastrepha* (Diptera: Tephritidae) intercepted at ports of entry, **Don Vacek,** USDA, APHIS, PPQ, CPHST.

2:40 PM **MF-02** Detection of genetic variation in populations of *Anastrepha ludens* (Diptera: Tephritidae) by molecular-based fingerprinting methods, **Roxanne Garza,** USDA, APHIS, PPQ, CPHST.

3:00 PM **Break** (Padre A-C)

3:20 PM **MF-03** Integrating treatments to suppress adult populations and application of sterile insect technique for fruit flies with special reference to Mexican fruit fly (Diptera: *Anastrepha ludens*) program in TX, **Robert Mangan**, USDA-ARS.

3:40 PM **MF-04** Attractants new and old for the Mexican fruit fly, **David C. Robacker,** USDA ARS.

4:00 PM **MF-05** Mexican fruit fly populations in relation to the phenology of its sylvatic host, **Don Thomas**, USDA ARS.

TUESDAY, FEBRUARY 20, 2007

4:20 PM **MF-06** Eradication of the Mexican fruit fly, *Anastrepha ludens* (Diptera: Tephritidae), **Hugh Conway,** APHIS, PPQ, CPHST**.**

4:40 PM **MF-07** The art and science of implementing the Mexican fruit fly quarantines to facilitate citrus trade. **Shashank Nilakhe**, TDA.

5:00 PM **END**

STUDENT POSTER COMPETITION

Location: Padre A-C

SP-01 Progress in evaluating converted cotton race stocks for resistance to whiteflies. **Maggie Toothaker**, Texas A&M University; Marvin Harris, Texas A&M University; Wayne Smith, Texas A&M University.

SP-02 Molecular identification and population dynamics of two species of root-feeding aphids in cruciferous vegetables. **Naiqi Chen**, Texas A&M University-Kingsville, Citrus Center; Tong-Xian Liu, Texas A&M University AES; Eliezer Louzada, Texas A&M University- Kingsville.

SP-03 *Liriomyza* species composition, associated parasitoid complex and effects on parasitoids of commonly use insecticides on vegetables in the lower Rio Grande Valley, TX. **Ricardo Hernandez,** Texas A&M University; Tong-Xian Liu, Texas A&M University; Kevin Heinz, Texas A&M University.

SP-04 Ecological assessment of arthropod populations in relation to different tillage and roundup ready cropping systems. **Michal Roberts**, Kansas State University/West Texas A&M University; Gerald Wilde, Kansas State University.

SP-05 Spiders on saltcedar as predators of the biological control agent *Diorhabda elongata.* **Eric Knutson**, New Mexico State University; David Richman, New Mexico State University.

SP-06 Resistance of stored sorghum to maize weevil (Coleoptera: Curculionidae). **Madani Telly**, West Texas A&M University; Bonnie Pendleton, West Texas A&M University.

SP-07 Symbiotic bacterium *Bacillus* in hemolymph of 4th instar larvae of red imported fire ant (RIFA), *Solenopsis invicta* Buren. **Stanley Gunawan**, University of Texas at Tyler; Blake Bextine, University of Texas at Tyler.

SP-08 *Xylella fastidiosa* strain differentiation in vector insects based on *gyrase* B RFLP. **Natalie Vitovsky**, University of Texas at Tyler; Blake Bextine, University of Texas at Tyler.

SP-09 Some Mantodea from Southeastern Mexico. **Carolina Nuñez**, Universidad Autonoma Agraria Antonio Narro (Mexico); Julio Rivero, Royal Ontario Museum (Canada).

SP-10 Utilization of various Lepidopteran hosts for development and reproduction of *Bracon hebetor* (Hymenoptera: Braconidae). **Mukti Ghimire**, Oklahoma State University; Thomas Phillips, Oklahoma State University.

SP-11 96-well extraction technique for efficiently extracting *Xyllela fastidiosa* DNA from GWSS. **Aika Choudhry**, University of Texas at Tyler; Blake Bextine, University of Texas at Tyler.

SP-12 Potato/tomato Psyllid (*Bactericera cockerelli*) biotypes differentiation and symbiont detection. **Yi-Chern Lin**, University of Texas at Tyler; Brian Jackson, University of Texas at Tyler; Blake Bextine, University of Texas at Tyler.

SP-13 Differentiation of monogyne and polygyne RIFA colonies using SYBR® green based QRT-PCR. **Danielle Tufts**, University of Texas at Tyler; Blake Bextine, University of Texas at Tyler.

SP-14 Effects of insect herbivory on swainsonine in locoweed species. **Joyce Parker**, New Mexico State University and Dave Thompson, New Mexico State University.

SUBMITTED POSTERS

Location: Padre A-C

P-01 Summary of saltcedar biocontrol activities and *Diorhabda* spp. studies in the Texas Panhandle. **Erin Jones**, Texas Agriculture Experiment Station; Sabina Mirik, Texas Agriculture Experiment Station; Jerry Michels, Texas Agriculture Experiment Station; Vanessa Carney, Texas Agriculture Experiment Station.

P-02 Managing spider mites and resistance in maize and sorghum. **Roxanne Bowling**, Texas Cooperative Extension; Bonnie Pendleton, West Texas A&M University; Jerry Michels, Texas Agricultural Experiment Station.

P-03 Threshold weight for the induction of pupation in predatory Coccinellidae. **Mpho Phoofolo**, Kristopher Giles, Oklahoma State University; Norm Elliott,USDA-ARS.

P-04 Development of corn leaf aphid, *Rhopalosiphum maidis* Fitch) (Hemiptera:Aphididae), at different temperatures on sorghum. **Shivakumara Bheemappa**, Bonnie Pendleton, West Texas A&M University; Jerry Michels, Texas Agricultural Experiment Station.

P-05 Biology of the gall midge *Asphondylia prosopidis* and its potential use as a biological control agent for mesquite. **Howard Beuhler**, New Mexico State University; David Thompson, New Mexico State University.

P-06 Fitness of *Diorhabda elongata* (Coleoptera;Chrysomelidae) feeding on stunted primordial regrowth of chemically controlled *Tamarix.* **Kevin Gardner**, New Mexico State University; Brian Zens, New Mexico State University; David Thompson, New Mexico State University.

P-07 Technical advisory committee of the Q-Biotype whitefly taskforce. **Scott Ludwig**, Texas Cooperative Extension; Peter Ellsworth, University of Arizona; L. Osborne, University of Florida; Tim Dennehy, University of Arizona; Osama El-Lissy USDA-APHIS-PPQ.

P-08 Assessment of wavyleaf thistle infestation and potential for biological control in the Texas Panhandle. **Nagendra Babu Earle**, West Texas A & M University; Gerald Michels, Texas Agricultural Experiment Station; Bonnie Pendleton, West Texas A&M University.

P-09 Do starved parasitoids kill more whitefly nymphs through host feeding? **Lian-Sheng Zang**, Texas Agriculture Experiment Station, Texas A&M University; Tong-Xian Liu, Texas A&M University.

P-10 Infection and histopathological changes of *Bemisia tabaci* nymphs by *Beauveria bassiana*. **Zhong-Ren Lei**, Chinese Academy of Agricultural Sciences; Zhao Liu, Northwest A & F University (China); Bao-Zhen Hua, Northwest A & F University (China); Tong-Xian Liu, Texas A&M University.

P-11 Biomass reduction in wheat due to infestation by Russian wheat aphid (Hemiptera: Aphididae) in production fields. **Mustafa Mirik**, Texas A&M University, Agricultural Experiment Station; Gerald Michels, Texas A&M University, Agricultural Experiment Station; Sabina Kassymzhanova-Mirik, Texas A&M University, Agricultural Experiment Station; Norman Elliott, USDA-ARS.

P-12 Yield compensation from simulated bollworm (*Heliocoverpa zea*) losses in New Mexico cotton. **Jane Breen Pierce**, New Mexico State University; Patricia Yates, New Mexico State University.

P-13 Cotton fleahopper foraging resources in central Texas. **Jesus Esquivel**, USDA, ARS; Sharon Mowery, USDA, ARS.

P-14 Impact of thermal cotton defoliation on silverleaf whitefly populations. **Scott Bundy**, New Mexico State University; Paul Funk, USDA-ARS Southwester Cotton Ginning Laboratory; Sam Lowry, New Mexico State University; Roberts Steiner, New Mexico State University.

P-15 Distribution and diversity of Russian wheat aphid (Homoptera: Aphididae) biotypes in North America. **Gary Puterka**, USDA-ARS, Stillwater, OK; John Burd, USDA-ARS, Stillwater, OK; David Porter, USDA-ARS, Stillwater, OK; Kevin Shufran, USDA-ARS, Stillwater, OK; Cheryl Baker, USDA-ARS, Stillwater, OK; Bob Bowling, Pioneer Hybrid International; Carl Patrick, Texas Cooperative Extension.

P-16 Reproductive potential of overwintering boll weevils after feeding on pollen. **Shoil Greenberg**, USDA-ARS; Gretchen Jones, USDA-ARS; John Adamczyk, USDA-ARS; Scott Armstrong, USDA-ARS, M. Setamou, Texas A&M University; Randy Coleman, USDA-ARS.

P-17 Feeding preference of *Homolodisca vitripennis* (Germar) (Hemiptera: Cicadellidae) for native and introduced plant species common to the Edwards Plateau area of Texas. **Aaron Hassell**, Texas Agricultural Experiment Station; Isabelle Lauziere, Texas Agricultural Experiment Station; Forrest Mitchell, Texas Agricultural Experiment Station.

P-18 The red imported fire ant, *Solenopsis invicta:* known distribution in Mexico. **Sergio Sanchez**, Universidad Autonoma Agraria Antonio Narro (Mexico); Ricahrd Patrock, The University of Texas at Austin; Lawrence Gilbert, The University of Texas at Austin.

P-19 Predation by *Neoseiulus californicus* (McGregor) on eggs, larvae and nymphs of *Tetranychus urticae* Koch on apple leaves. **Jeronimo Landeros**, Universidad Autonoma Agraria Antonio Narro (Mexico); Ricardo Flores, Universidad Autonoma Agraria Antonio Narro (Mexico); Luis Guevara, Universidad Autonoma Agraria Antonio Narro (Mexico).

P-20 Protein quantification in *Tetranychus urticae* Koch. **Jeronimo Landeros**, Universidad Autonoma Agraria Antonio Narro (Mexico); Ernesto Cerna, Universidad Autonoma Agraria Antonio Narro (Mexico); Eugenio Guerrero, Universidad Autonoma Agraria Antonio Narro (Mexico); Mohammad Badii, Universidad Autonoma de Nuevo Leon (Mexico); Yisa Ochoa, Universidad Autonoma de Aguascalientes (Mexico).

P-21 Morphometric comparision of *Lygus* species. Ram Shrestha, Texas Agricultural Experiment Station; **Megha Parajulee**, Texas Agricultural Experiment Station.

P-22 Survey of lady beetles in the Texas High Plains. **Stanley Carroll**, Texas Agricultural Experiment Station; Megha Parajulee, Texas Agricultural Experiment Station; Mark D. Arnold, Texas Agricultural Experiment.

P-23 Development of aphid sampling plans for winter canola. **Kaushal Maskey**, Oklahoma State University; Kristopher Giles, Oklahoma State University; Dennis Kastl, Oklahoma State University; Tom Roller; Oklahoma State University; Norm Elliott, USDA-ARS.

P-24 Attraction of three stored product pests to insect-infested grain. **Andrew Puckette**, Oklahoma State University; Tom Phillips, Oklahoma State University; Edmond Bonjour, Oklahoma State University.

TUESDAY, FEBRUARY 20, 2007

P-25 Free amino acids from greenbugs, *Schizaphis graminum* (Rondani) (Homoptera: Aphidae), and its host plants, seedlings of wheat, *Triticum aestivum.* **Xiong Chen**, Texas Agricultural Experiment Station; Yiqun Weng, Texas Agricultural Experiment Station; Jackie Rudd, Texas Agricultural Experiment Station; Gerald Michels, Texas Agricultural Experiment Station.

P-26 Honey bee consumption of pollen at varying dilutions. **Lizette Peters**, Texas A&M University; Spencer Behmer Texas A&M University; Tanya Pankiw, Texas A&M University.

P-27 Fall armyworm susceptibility to Bollgard I, Bollgard II, and Widestrike cotton as determined from a leaf-dish assay. **J. Scott Armstrong**, John Adamczyk, and S. M. Greenberg, USDA-ARS.

Linnaean Games – Round II and Finals
Location: Riviera 1-2 5:00 – 7:00 PM

Banquet and Awards Program
Location: MarinaView Room

Social Time, Cash Bar 7:00 – 9:00 PM

Dinner and Awards Program 7:00 – 9:00 PM
Presentation of Student Competition –
President David Thompson and Bonnie Pendleton, Chair,
Student Research Paper and Poster Awards Committee

WEDNESDAY, FEBRUARY 21, 2007

Poster Viewing
Location: Padre A-C 8:00 AM – 5:00 PM

Concurrent Sessions: Riviera 3-5

Symposium: Pierce's disease: Impacts on Texas agriculture
Moderator: Blake Bextine

8:00 AM Introduction to Pierce's Disease, **Blake Bextine**, University of Texas at Tyler.

8:20 AM **PD-01** Distribution and abundance of possible Xylella vectors in Texas vineyards, **Forrest Mitchell**, Isabelle Lauziere, Texas Agricultural Experiment Station, Blake Bextine, University of Texas at Tyler, Jeff Brady, Texas Agricultural Experiment Station.

8:40 AM **PD-02** Seasonal patterns of female *Homalodisca coagulata* (Say) reproductive physiology in Riverside, CA. **Natalie Hummel,** USDA ARS**,** Frank Zalom, University of California at Davis, Nick Toscano, University of California at Riverside, Prabir Burman, University of California at Davis, and Christine Peng, University of California at Davis.

9:00 AM **PD-03** Monitoring vineyards for possible vectors of Pierce's disease in Oklahoma. **Phil Mulder,** and Kelly Seuhs, Oklahoma StateUniversity.

9:20 AM **PD-04** Exploration for biological control agents in the native range of glassy-wing sharpshooter. John Goolsby, USDA ARS, Jeff Skevington, Agriculture and Agri-Food (Canada), and **Blake Bextine** University of Texas at Tyler.

Break Location: Padre A-C 9:40 – 10:00 AM

THANK YOU, SPONSORS!

10:00 AM **PD-05** Seasonal changes in egg production of glassy-winged sharpshooter females, *Homalodisca vitripennis* (Hemiptera: Cicadellidae), **Isabelle Lauziere**. Texas Agricultural Experiment Station.

10:20 AM **PD-06** *Xylella fastidiosa* in Texas: Implications of a multiple vector, strain, and host plant system, **Blake Bextine**, University of Texas at Tyler.

10:40 AM **PD-07** Detection and genotyping of *Xylella fastidiosa* by RT-PCR. **Jeff Brady**, Texas Agricultural Experiment Station, Forrest Mitchell, Texas Agricultural Experiment Station, Isabelle Lauziere, Texas Agricultural Experiment Station, Blake Bextine, University of Texas at Tyler.

11:00 AM **PD-08** Know thy enemy: Understanding the genetics of *Xylella fastidiosa* in Texas, **Lisa Morano**, University of Houston.

11:20 AM Closing remarks, **Blake Bextine**, University of Texas at Tyler.

11:40 AM **END**

Lunch---on your own 11:40 AM – 1:00 PM

Concurrent Sessions: Riviera 1-2

Submitted Papers: Crop Protection
Moderators: Brett Highland & Chris Nansen

8:00 AM **CP-01** QRD 400, a novel plant extract for plant insect and mite management. **Brett Highland**, AgraQuest, Inc; Paul Walgenbach, AgraQuest, Inc; Helene Chiasson, AgraQuest, Inc.

8:12 AM **CP-02** Stem borer IPM in rice. **M. O. Way**, Texas Agricultural Experiment Station, T.E. Reagan, Louisiana State University; Francis Reay-Jones, Clemson University.

8:24 AM **CP-03** Pecan IPM accomplishments. **Marvin Harris**, Texas A&M University; Bill Ree, Texas Cooperative Extension.

8:36 AM **CP-04** Using volunteer pecan producers to monitor first generation pecan nut casebearer, *Acrobasis nuxvorella* Neunzing, for a state wide prediction program. **Bill Ree**, Texas Cooperative Extension; Marvin Harris, Texas A&M University.

8:48 AM **CP-05** Insect control economics in stored corn with selected insecticide rates. **Roy Parker**, Texas Cooperative Extension; Larry Falconer, Texas Cooperative Extension.

9:00 AM **CP-06** Can stored wheat be protected with top-dress insecticide applications? **Edmond L. Bonjour,** Oklahoma State University; Thomas W. Phillips, Oklahoma State University; Frank H. Arthur, USDA-ARS.

WEDNESDAY, FEBRUARY 21, 2007

9:12 AM **CP-07** New economic thresholds for corn earworm in sorghum. **Greg Cronholm**, Texas Cooperative Extension; Allen Knutson, Texas Cooperative Extension.

9:24 AM **CP-08** New economic thresholds for sorghum midge in sorghum. **Greg Cronholm**, Texas Cooperative Extension; Allen Knutson, Texas Cooperative Extension.

Break Location: Padre A-C 9:40 – 10:00 AM

THANK YOU SPONSORS!

10:00 AM **CP-09** Weather-based risk warning system for pests in agriculture. **Christian Nansen**, Texas A & M University; Peter Edde, Montana State University; Thomas Phillips, Oklahoma State University.

10:12 AM **CP-10** Flubendiamide: The next generation in Lepidoptera pests management. **Drew Palrang**, Bayer CropScience; Shane Hand, Bayer CropScience.

10:24 AM **CP-11** Corn earworm control on sweet corn in the Colorado Western slope. **Juan Lopez**, USDA-ARS; M.A. Latheef, USDA-ARS; M. O'Neil, USDA-ARS.

10:36 AM **CP-12** Onion thrips transmitted iris yellow spotted virus on onions: A new problem for onion growers in Texas, **Tong-Xian Liu,** Texas Agricultural Experiment Station.

Concurrent Sessions: Riviera 1-2

Submitted Papers: Physiology/Toxicology/Biochemistry/Molecular
Moderator: Christian Nansen

10:48 AM **PH-01** Immunocytochemical detection of biogenic amines in the synganglion of *Rhipicephalus (Boophilus) microplus* and other ixodid ticks. **Natalie Hummel**, USDA-ARS; Colleen Witt, RCMI Advanced Imaging, Universtity of Texas; Andrew Li, USD-ARS.

WEDNESDAY, FEBRUARY 21, 2007

Concurrent Sessions: Riviera 1-2

Submitted Papers: Biological Control
Moderator: Chris Nansen

11:00 AM **BC-01** Biological control of saltcedar (*Tamarix spp*.) in South Texas with the saltcedar leaf beetle, *Diorhabda elongata*, and effects on athel (*T. aphylla*). **Patrick Moran**, USDA-ARS; Jack Deloach, USDA-ARS.

11:12 AM **BC-02** Biological control of saltcedar in West Texas: Progress and prospects, **Allen Knutson**, Texas Cooperative Extension; Mark Muegge, Texas Cooperative Extension; Jack DeLoach, USDA-ARS.

11:24 AM **BC-03** Spatial vs traditional analysis of weed biocontrol efforts: Is the tape measure on the endangered list? **Vanessa Carney**, Texas Agricultural Experiment Station; Gerald Michels, Texas Agricultural Experiment Station; David Jurovich, Texas Agricultural Experiment Station.

11:36 AM **BC-04** Dynamic expansion of recently introduced populations of fire ant parasitoids (Diptera: Phoridae). **Edward LeBrun**, University of Texas; Rob Plowes, University of Texas; Lawrence Gilbert, University of Texas.

Concurrent Sessions: Riviera 1-2

Submitted Papers: Biology/Ecology/Behavior
Moderator: Chris Nansen

11:48 AM **BE-01** The importance of life functions in aphid population simulation. **Vasile Catana**, Oklahoma State University; Norman Elliott, USDA-ARS; Kris Giles, Oklahoma State University; Dave Porter, USDA-ARS; Mpho Phoofolo, Oklahoma State University.

Lunch---on your own 12:00 – 1:00 PM

WEDNESDAY, FEBRUARY 21, 2007

Concurrent Sessions: Riviera 3-5

Symposium: Urban Entomology and Outreach Programs in the Southwestern United States
Moderator: Bob Davis

1:00 PM **UE-01** Opportunities & challenges in urban pest management. **Robert Davis**, BASF Specialty Products.

1:20 PM **UE-02** Ten years of legislation and education: Impact of statewide IPM requirements on Texas schools. **Michael Merchant**, Texas Cooperative Extension; Janet Hurley, Texas Cooperative Extension.

1:40 PM **UE-03** Overview of extension fire ant activities in Arkansas. **John Hopkins**, University of Arkansas; Kelly Loftin, University of Arkansas .

2:00 PM **UE-04** Home pest management. **Elizabeth Brown,** Texas Cooperative Extension; Thomas Fuchs, Texas Cooperative Extension

2:20 PM **UE-05** Rover Ants: Challenges for pest management professionals. **Janis Reed ,** ABC Pest & Lawn Services.

Break Location: Padre A-C 2:40 – 3:00 PM

THANK YOU, SPONSORS!

3:00 PM **UE-06** Efficacy of Phantom termiticide/insecticide for subterranean termite control in the United States. **Robert Davis,** BASF Specialty Products.

3:20 PM **UE-07** Area wide management of the formosan termite *coptotermes formosanus* in Texas: Identification, invasion biology, and control. **James Austin,** Texas A&M University; Roger Gold, Texas A&M University.

3:40 PM **UE-08** Biological assessment of an exotic *Paratrechina* sp. in Texas. **Jason Meyers,** Texas A&M University; Roger Gold, Texas A&M University.

4:00 PM **UE-09** Temperature effect on uptake and transfer of ^{14}C-fipronil in subterranean termites. **Shripat Kamble,** University of Nebraska; Neil Spomer, University of Nebraska.

4:20 PM Closing Remarks - **Bob Davis**.

4:40 PM **END**

WEDNESDAY, FEBRUARY 21, 2007

Concurrent Sessions: Riviera 1-2

Submitted Papers: Biology/Ecology/Behavior
Moderator: Jerry Michels

1:00 PM **BE-02** Carabid beetles as indicators of variation in riparian habitats: A preliminary look. **G. J. Michels**, Texas Agricultural Experiment Station; V.A. Carney, Texas Agricultural Experiment Station; E.A Jones, Texas Agricultural Experiment Station; J.B. Bible, Texas Agricultural Experiment Station.

1:12 PM **BE-03** Stored grain relationships when food availability is unlimited. **Christian Nansen**, Texas A & M University; Paul Flinn, USDA-ARS.

1:24 PM **BE-04** Spatial distribution of entomopathogenic nematodes in a Chihuahuan desert agricultural landscape. **Sergio Sanchez**, Universidad Autonoma Agraria Antonio Narro (Mexico); Aron Vasquez, Universidad Autonoma Agraria Antonio Narro (Mexico).

Concurrent Sessions: Riviera 1-2

Submitted Papers: Urban & Other
Moderator: Jerry Michels

1:36 PM **UO-01** Multi-grade and multi-discipline activities in the study of cochineal scale insects (Homoptera:Coccoidea:*Dactylopius spp*.). **Michelle Niña Leddel**, Century High School (California).

1:48 PM **UO-02** Reaching students outside the department with a course on aquatic entomology for anglers. **John Jackman**, Texas A & M University.

Concurrent Sessions: Riviera 1-2

Submitted Papers: Regulatory/Extension
Moderator: Jerry Michels

2:00 PM **RE-01** Digital video in extension entomology and teaching: What works and what doesn't. **Pat Porter**, Texas Cooperative Extension.

2:12 PM **RE-02** Internship program to develop future IPM professionals. **Thomas Fuchs**, Texas Cooperative Extension.

WEDNESDAY, FEBRUARY 21, 2007

Concurrent Sessions: Riviera 1-2

Submitted Papers: Medical/Veterinarian
Moderator: Jerry Michels

2:24 PM **MV-01** Genetic based approaches to mosquito-borne disease control. **David Pledger**, Texas A&M University-Kingsville; Craig Coates,Texas A&M University.

2:36 PM **END**

Remove Posters 5:00 – 7:00 PM

Final Business Meeting – SW Branch ESA
Location: Riviera 3-5 5:00 – 7:00 PM

Dinner on Your Own

Student Mixer
Location: Marina View Room 7:00 – 8:00 PM

General Members' Mixer
Location: Marina View Room 8:00 – 10:00 PM

THURSDAY, FEBRUARY 22, 2007

Insect Expo
Location: Corpus Christi Museum of Science and History 9:00 AM – 3:00 PM

SW Branch-ESA Executive Committee, Final Meeting (2006-2007)
Location: Monty's Boardroom 5:00 – 7:00 PM

Southwestern Branch, Entomological Society of America Presenter Index

O – Submitted Oral Presentation
P – Submitted Poster Presentation
SO – Student Oral Presentation Competition
SP – Student Poster Presentation Competition
PD – Pierce's Disease Symposium
MF – Mexican Fruit Fly Symposium
UE – Urban Entomology and Outreach Symposium
CR – Cross-Commodity Resistance Symposium

BC – Biological Control
BE – Biology/Ecology/Behavior
RE – Regulatory and Extension
PH – Physiology/Biochem./Tox./Molecular
CP – Crop Protection
UO – Urban and Other
VM – Veterinary/Medical

Author Index (Presenter and Presentation Number(s))

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Chm. R.C. Bushland	1951-52	San Antonio, TX
Chm. H.G. Johnston*	1950-51	Dallas, TX

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ABSTRACTS

SO = Student Oral Presentations SP = Student Poster
O = Submitted Oral Presentations P = Submitted Poster
(For other abbreviations see p 34)

Student Oral Presentations (Competition):

SO-01 Stacey Bealmear, Scott Bundy and Dawn Vanleeuwen, New Mexico State University

Feeding injury by Lygus to cotton in New Mexico
A study was conducted during the summer of 2005 and 2006 to examine the feeding injury on whole cotton plants and individual squares and bolls by *Lygus hesperus* in New Mexico. Nymphs (4^{th} and 5^{th} instar) as well as adults were placed onto whole cotton plants at different densities and were allowed to feed for one week. Individual lygus of all three life stages were placed on a single squares and bolls and allowed to feed for 48 hrs. Whole plant injury in 2005 showed no significant difference between lygus densities. Insect stadia did produce significant differences with 5^{th} instar lygus causing more injury than 4^{th} instar and adults. In the square and boll experiment conducted during 2005 no external feeding lesions were observed for any cotton squares exposed to lygus. Internal injury was significantly greater for 5th instars than adults. External feeding lesions were observed on bolls exposed to all three bug stadia. The greatest number of lesions was produced by 4th instars in young bolls and 5th instars in older bolls. Inner carpel wall injury or "warts" and lint injury were produced by all three age classes of lygus, with 5th instars producing the greatest amount of damage.

SO-02 Brian Jackson, University of Texas at Tyler; Matt Blua, University of Texas at Tyler; Blake Bextine, University of Texas at Tyler

Molecular quantification of *Xylella fastidiosa* cells transmitted by *Homalodisca vitripennis.*
Transmission of Pierce's disease (PD) between plant hosts involves three main steps, acquisition of *Xylella fastidiosa* (*Xf*) by a vector, inoculation of a host plant by the vector, and establishment of sufficient titers of *Xf* in the host to cause disease. Understanding the basic biology of the transmission process may be key to limiting the spread of PD. Glassy-winged sharpshooters, *Homalodisca vitripennis* (Hemiptera, cicadellidae), with acquired titers of *Xf* were allowed access to chrysanthemum plant cuttings for between 30, 60, 90 or 120 minutes and the number of *Xf* cells present in the insect foregut and transmitted to the plant were determined using quantitative real-time PCR. The amount of time feeding and the number of probes were also monitored using video surveillance. Using multiple linear regression, there was a lack of correlation between the amount of time spent feeding per probe and the number of *Xf* cells inoculated, but the number of probes was significantly correlated with the number of *Xf* cells inoculated. Due to the highly variable nature of transmission, R^2 values were too low to have predictive value, but these findings suggest that the mechanism of transmission is dependant on probing behaviors more than ingestion time.

SO-03 Danny McDonald, Texas Agricultural Experiment Station; Isabelle Lauziere, Texas Agricultural Experiment Station; Forrest Mitchell, Texas Agricultural Experiment Station

Temperature effects on glassy-winged sharpshooter trap counts in Texas vineyards.
Yellow sticky trap samples have been collected from Central and North-central Texas vineyards since 2003. In collaboration with USDA-APHIS, this effort was expanded to statewide collections in 2005. Several xylem feeding Hemiptera species were identified and counted on these traps. *Homalalodisca vitripennis* (previously known as *H. coagulata* or the glassy-winged sharpshooter), is the most serious vector of Pierce's disease in the United States. Trap counts were correlated with temperature to show its effect on the glassy-winged sharpshooters arrival into vineyards. Evidence of a predictable time of arrival of *H. vitripennis* is observable.

SO-04 Shivakumara Bheemappa and Bonnie B. Pendleton, West Texas A&M University; Gerald J. Michels, Jr, Texas Agricultural Experiment Station

Corn leaf aphid fecundity and longevity at different constant temperatures on sorghum.
The corn leaf aphid, *Rhopalosiphum maidis* (Fitch) (Hemiptera: Aphididae), infests maize, *Zea mays* L., and sorghum, *Sorghum bicolor* (L.) Moench, throughout the United States. This aphid lives in the whorl, sucks sap, and mottles plant leaves yellow. However, corn leaf aphids can be considered beneficial because they attract lady beetles and other natural enemies that stay to feed on greenbugs, *Schizaphis graminum* (Rondani), and other insect pests of sorghum and other crops. Effect of temperature on development of corn leaf aphids on sorghum has not been studied. Pre-reproductive period, fecundity, and longevity of corn leaf aphids on Tx399 x RTx430 sorghum were assessed at constant temperatures of 15, 20, 25, 30, and 35°C in an incubator at a photoperiod of 14:10 (light:dark) hours. A total of 80 aphids was evaluated at each temperature. Corn leaf aphids produced more nymphs and lived longer at cooler temperatures. Most nymphs (54.1) were produced per corn leaf aphid at 20°C, with 45.3, 38.3, 28.2, and 0.0 nymphs produced at 15, 25, 30, and 35°C, respectively. Average longevity was 63.4, 41.9, 32.7, 18.5, and 5.7 days at 15, 20, 25, 30, and 35°C, respectively. Intrinsic rates of increase (r_m) were 0.301, 0.491, 0.897, and 0.821 at 15, 20, 25, and 30°C, respectively, increased with temperature to 25°C, then decreased. These data will be used to predict when corn leaf aphids after overwintering are expected to arrive in crop fields and used to develop a computer model to predict damage by greenbugs in Texas.

SO-05 Joy Newton, West Texas A & M University; Richard Kazmaier, West Texas A&M University; David Sissom, West Texas A & M University

Habitat use by robber flies (Diptera: Asilidae) in the Texas Panhandle.
Robber flies are one of the most dominant insect predators in arid grassland ecosystems. Habitat composition is temporally and spatially dynamic, with distinct seasonal plant phenologies resulting in unique assemblages of flies. Habitat use by a particular species may narrow habitats of conservation priority to those with the greatest species diversity or location of rare species. We are using malaise traps to assess robber fly habitat use through multiple years at a 12,000-acre site in Potter County, Texas. We will be sampling the four major habitats found on the site: mesquite shrublands, grasslands, riparian corridors, and sand sagebrush prairies. However, data only included flies collected in riparian and sand sagebrush habitats during this initial year of sampling. Species composition and diversity of the 18 species collected were compared between the two habitats. Five species were found only in sand sagebrush habitat, eight species found only in riparian habitat, and 5 species were found in both. The most numerous species, *Tuberculefferia tuberculata* (Coquillett) and *Megaphorus acrus* (Curran), show interesting seasonal patterns of abundance that appear to be moisture related.

SO-06 Jorge Achata, New Mexico State University; Norma Mujica, Octavio Zegarra, Jürgen Kroschel, and International Potato Center, Lima Peru

Pathogenicity screening of Peruvian *Paecilomyces fumosoroseus* isolates against *Bemisia tabaci* B type.
Increasing levels of resistance to chemical insecticides have been reported in insect pest populations, and the sweetpotato whitefly (*Bemisia tabaci* B type) is not an exception. This pest is widespread in the Peruvian coast valleys, where sweetpotato is a major crop. A pathogenicity screening of twenty Peruvian isolates of *Paecilomyces fumosoroseus* was performed and the most pathogenic isolate was selected, the relation dose-mortality was evaluated in second instar nymph. Results indicate that CIPWF24 was the most pathogenic isolate and that 2.24 x 10^7 conidia/ml represents the Medium Lethal Dose (CL_{50}) by the bioassay method used. The potential of CIPWF24 as an alternative for the biological control of whitefly is discussed and a Potential Value Index is proposed for the screening of pathogenic fungi for biological control.

SO-07 Tebkew Damte and Bonnie B. Pendleton, West Texas A&M University

Texas sorghum producers' perception of sorghum midge (Diptera: Cecidomyiidae).
Experience, source, and availability of information on insect pests and their control influence farmers' perceptions of an insect as a pest and affect decisions on control tactics to use and adoption of new control methods. Texas sorghum producers' perceptions were surveyed of sorghum midge, *Stenodiplosis sorghicola* (Coquillett), a worldwide key insect pest of sorghum, *Sorghum bicolor* (L.) Moench. A two-page questionnaire was prepared and mailed on 26 January 2006 to 197 members of the Texas Grain Sorghum Association. A total of 91 responses was obtained, but 17.6% of the respondents did not grow sorghum and were excluded from the study. Averages of 54.2, 2.7, and 29.2% of the respondents believed sorghum midge was an important pest of dryland, irrigated, and both dryland and irrigated sorghum, respectively. The rest (13.9%) indicated sorghum midge was not a problem. Estimates of annual yield loss attributable to sorghum midge ranged from zero to more than 40%. An average of 97.1% of the respondents scouted their sorghum for sorghum midge at least once during flowering, and 2.9% of respondents did not scout sorghum. It was found that 40.4, 24.1, and 3.5% of the respondents applied insecticide one, two, and three(s) times, respectively, per season. The rest (31.9%) did not apply insecticide. Knowledge about sorghum midge-resistant hybrids also differed -- only 4.1% of respondents use or have used a sorghum midge-resistant hybrid, 67.8% knew they grow susceptible hybrids, and the rest (28.1%) did not know whether the hybrid they grow was resistant or susceptible.

SO-08 Andrea Joyce, Texas A&M University; R. E. Hunt, Indiana University; S. B. Vinson Texas A&M University; J. S. Bernal, Texas A&M University

Mating and transmission of courtship vibrations for the parasitoid wasp, *Cotesia marginiventris*, on five rearing substrates.
The parasitoid wasp, *Cotesia marginiventris* (Cresson) (Hymenoptera: Braconidae), attacks economically important lepidopteran larvae in the family Noctuidae, including *Spodoptera* spp. and *Trichoplusia ni*, and has been considered for mass rearing for augmentative biological control. *C. marginiventris* is a solitary parasitoid which produces one offspring per host. Production of female wasps is important to mass rearing for biological control because females attack and kill host larvae. However, past attempts at rearing this wasp have at times resulted in male biased sex ratios, possibly due to low mating frequencies. The purpose of this study was to investigate the role of natural and artificial rearing substrates on the mating frequency and transmission of courtship vibrations for this wasp. Substrate is known to influence mating for arthropods that use vibrational courtship signals. *Cotesia* males produce substrate vibrations that are thought to be courtship signals perceived by the females. We determined the mating frequencies of *C. marginiventris* on five natural and artificial rearing substrates, including plastic, glass, chiffon fabric, and corn and bean leaves. Subsequently, we recorded the courtship vibrations on each substrate, and compared courtship signal parameters including frequency and relative amplitude among the five substrates. We found that substrate influenced the mating frequency of this parasitoid and the transmission of its courtship vibrations. Careful selection of the substrates used in rearing programs could improve mating for these parasitoids.

SO-09 Michelle Sanford, Texas A&M University, Jimmy K. Olson, Texas A&M University, Thomas J. DeWitt, Texas A&M University and Jeffery Tomberlin, Texas Cooperative Extension Service.

Mosquito oviposition: Does larval experience with predators influence adult oviposition decisions? A preliminary study.
The mosquitofish, *Gambusia affinis* is a widely-used mosquito control agent that is often introduced into larval habitats. A recent study suggested that the chemicals emitted by mosquitofish influenced the oviposition behavior of female *Culex* mosquitoes in the field. Several studies have suggested that female mosquitoes may avoid oviposition sites based on the presence of larval predators and claimed that female mosquitoes may avoid the chemicals that predators leave in the habitat. Other studies have shown that natal

habitat influences female oviposition decisions in the lab. This study examined the impact of larval experience with chemicals emitted by predatory mosquitofish and the oviposition decisions made by adult female *Culex quinquefasciatus* Say. Larval mosquitoes were reared under three different treatment regimes: in pans with mosquitofish (separated by a screen that allowed water flow but not movement of larvae or fish) fed Tetramin® fish food (the same diet that larvae received), pans with mosquitofish fed conspecific mosquito larvae (at 10-20 larvae per day), and pans without fish at all. The mosquitoes reared under these conditions were allowed to pupate and emerge from these habitats. Following blood-feeding, gravid females were then offered a choice of oviposition habitats: water from a source that had mosquitofish that were fed Tetramin®, water from a source that had mosquitofish fed conspecific larvae, water from a source where larvae had been reared with no fish present, and distilled water. The mean number of egg rafts counted in the four different oviposition substrates revealed no significant differences when analyzed with one-way analysis of variance. Females did not preferentially choose to oviposit in their natal habitat and laid eggs in habitats that had previously contained predatory fish regardless of experience. These data suggest that chemicals produced by mosquitofish may not be oviposition deterrents in and of themselves, as previous studies have suggested.

SO-10 Luis Espino and M. O. Way, Texas A&M University

Most susceptible stage of rice panicle development to the rice stink bug (*Oebalus pugnax*).
The objective of this study was to determine the stage of rice panicle development most susceptible to rice stink bug (RSB) attack. During 2005 and 2006, in greenhouse and field experiments, rice plants were caged at the boot stage and then infested with adult or nymph RSB. Plants were infested during one of three stages of panicle development: heading, milk or soft dough. Insects were allowed to feed on the plants for the duration of each stage and then killed. After maturation, panicles were harvested and grain hulled and milled. Grain weight, percent pecky grain and percent whole grain after milling were recorded. No differences were found in the weight of rough, brown or milled rice infested with RSB during different stages of panicle development. More peck was found in grain from panicles infested during dough and milk than in grain from panicles infested during heading. Adult RSB caused more peck than nymphs in all stages of panicle development. An inverse relationship was found between percent peck and percent whole grain weight.

SO-11 Robert T. Puckett, Alejandro Calixto, and Charles L. Barr Texas A&M University

Passive traps for monitoring *Pseudacteon* phorid flies; parasitoids of *Solenopsis* fire ants
Pseudacteon phorid flies that parasitize workers of *Solenopsis saevissima* complex fire ants (including red imported fire ants *Solenopsis invicta*) are being investigated as classical biological control agents for *S. invicta* in North America. Currently, fly presence is determined by direct observation of disturbed mounds or midden (colony refuse piles) for appearance of flies presumably attracted to chemical cues emanating from these materials. Field testing of a passive trap (PTS Trap) that exploits both the behavioral response of *Pseudacteon phorids* to *S. invicta* midden as well as the perching behavior of these flies shows this method is superior in operational efficiency and effectiveness relative to other techniques. Adult flies responding to deployed *S. invicta* midden are captured when they land on a Tanglefoot®-coated perch, which is part of the trap. This passive method provides a uniform, repeatable and verifiable sample that allows continuous and simultaneous sampling among locations, which can only be accomplished with other techniques by substantially increasing the number of observers. These traps have been shown effective in various phorid habitats in central Texas and Florida and will improve our ability to evaluate establishment following releases, detect expansion of phorid populations, obtain relative estimates of fly densities among locations and through time, etc. We expect this trap to also be effective in detecting/monitoring phorid flies in other locations.

SO-12 Kishan Sambaraju, Oklahoma State University; Thomas Phillips, Oklahoma State University

Ovipositional preference and larval performance of two strains of Indianmeal moth

Laboratory and field strains of the Indianmeal moth, *Plodia interpunctella* (Hübner) (Lepidoptera: Pyralidae) were assessed for differences in development and oviposition behavior under constant environmental conditions. Development of neonate larvae of each strain was observed on 1 g of each of eleven different diets, which were wheat, barley, soybean, chick pea, apricot, prunes, walnut, pecan, fennel, coriander, and lab rearing diet, in 6 cm glass vials. Adults of the field strain weighed significantly less than the lab moths, and females were significantly heavier than males, overall for the 11 foods. Larvae of both strains reared on soybean and chick pea resulted in heavier adults than those from other foods. Oviposition preference studies were then done to determine if larval performance on a particular food correlates with adult preference. No-choice oviposition experiments were conducted in 5.7 L plastic boxes, and 4-choice experiments utilized 27 L plastic boxes. Six foods were used in no-choice experiments and were selected based on their relative suitability for larval development by each strain. Both lab and field strain females laid eggs on foods that were found unsuitable for larval survival (e.g., coriander, walnut). However, significantly greater number of eggs were laid in a dish with soybean compared to other foods. In four choice experiments with soybean, barley, coriander, and an empty dish (control), field moths preferred to lay eggs in soybean over the other two foods, whereas lab moths were not selective and laid eggs similarly on all three foods offered. Our results show that laboratory moths do not display a clear oviposition preference when given a choice of foods that vary greatly in their suitability for offspring survival. Field moths were highly selective and showed clear preference for the best larval diet when offered a choice.

SO-13 Alejandro Calixto, Texas A&M University; Marvin K. Harris, Texas A&M University; Charles L. Barr, Texas A&M University

Interference competition by *Solenopsis invicta* displaces native ants at broadcast baits: implications for management of *S. invicta* and restoration of native ants.

Higher densities of *S. invicta* in the US relative to South America are explained by the absence of natural enemies and lack of strong interspecific competition. Despite advances in *S. invicta* management using biological control agents, broadcast baits remain as the primary tool for effective control. However, the effects of baits on native ants are relatively unknown. Understanding these effects is critical for *S .invicta* management since native ant competition may enhance the effect of introduced biological control agents. A pilot study documented that the impact of baits was greater on *S. invicta* and that the majority of unaffected ant species had a positive response to the reduction of *S. invicta*. This showed that baits and native ants are not always incompatible. We explored strategies to combine the use of baits with interspecific competition for the management of the invasive. Our goals are to determine whether different types of *S .invicta* management procedures affect native ants and to determine, if they are not affected, how they contribute to slow re-invasion of *S. invicta*. We conducted experiments on three sites in Texas using a BACI-P design. Sites were treated with methoprene and indoxacarb baits. Ants were monitored using pitfall traps and hot dogs. Plain bait was applied and species collecting grits were recorded. Preliminary results indicates that different management methods did not impact native ants when they are at low and medium densities and that *S. invicta* is greatly affected, at high native ant density competition for these baits is observed affecting both natives and the invasive. We conclude that from the conservation perspective and with proper use, baits may help to restore native ants, re- treatments may have a serious impact on natives. From the management perspective, reported bait failures may be caused due to interspecific competition therefore justifying re-treatments.

STUDENT POSTER PRESENTATIONS (Competition):

SP-01 Mary M. Toothaker, Marvin K. Harris, and C. Wayne Smith, Texas A&M University

Progress in evaluating converted cotton race stocks for resistance to whiteflies.
Chemical control of whitefly is the most common form of control today, but whiteflies have developed resistance to many chemicals including organochlorines, carbamates, and pyrethroids (Horowitz et al. 1988). Integrated pest management strategies have been explored, such as biological control and alternate planting dates, but these do not fully protect the plant from the pest. In addition, these whiteflies have a broad host range. *Bemisia tabaci* feeds on over 540 plants (Basu 1985), including agronomic crops, vegetable crops, fruit trees, ornamentals, as well as weeds (Natwick et al. 2000). The objective of this research is to screen six converted cotton race stocks (CRS) described as having resistance characteristics to *Bemesia tabaci*, Biotype B (Homoptera:Aleyrodidae), whitefly (Ripple 2004) for variation in resistance within each CRS. In addition, a comparison between each CRS will be performed to determine if any one CRS possesses superior resistance characteristics. The characteristics to be considered are whitefly fecundity, percent mortality, and days to adulthood. Individual plant selections can then be made within each CRS to select the best material for further breeding. Experimental controls are two known susceptible commercial cultivars, Delta Pearl and PSC355

SP-02 Naiqi Chen, Tongxian Liu, and Eliezer S. Louzada, Texas A&M University

Molecular identification and population dynamics of two species of root-feeding aphids in cruciferous vegetables.
The poplar petiole gall aphid, *Pemphigus populitransversus* Riley, has been one of major pests on cruciferous vegetable in the Large Rio Grande Valley (LRGV) of Texas since the late 1940s. It normally migrates from poplar trees to cruciferous vegetables in the fall, and migrates back to the trees in early spring. A few years ago, some root-feeding aphids were found on cruciferous vegetable in late spring and early summer. These aphids have been identified as *Pemphigus obesinymphae* Moran. This discovery completely changed the current knowledge about the root-feeding aphids on cruciferous vegetables in the LRGV. Due to their small size, morphological and feeding similarity between *P. populitransversus* and *P. obesinyphae*, the identification of these two species is difficult. This study utilized molecular biology techniques to develop a particular, effective and manageable method for distinguishing these two species. The results showed both Random Amplification of Polymorphic DNA (RAPD) and Amplified Fragment Length Polymorphism (AFLP) can identify these two species. Compared with these two molecular biology techniques, RAPD is more simple and economical which is recommended. Furthermore, based on the observation of the two species, when they occur together or separately in cabbage fields during 16 months, this study determined the population dynamics and occurrence of the two aphid species, especially *P. obesinymphae* with unknown behavior characteristics, facilitated the development of more effective aphid management strategies/programs.

SP-03 Ricardo Hernandez Moreno, Tong-Xian Liu and Kevin Heinz

***Liriomyza* species composition, associated parasitoid complex and effects on parasitoids of commonly use insecticides on vegetables in The Lower Rio Grande Valley, TX.**
Populations of serpentine leafminers (*Liriomyza* species) have increased in the Lower Rio Grande Valley of Texas (LRGV) in recent years, becoming an important pest on vegetable crops. Growers fear *Liriomyza* species outbreaks as they exhibit high reproductive rates, they attack a wide range of hosts, and they can easily develop pesticide resistance. Integrated Pest Management practices including the use of hymenopterous parasitoids, can maintain populations of leafminers below economic thresholds. However, in the Lower Rio Grande Valley, little is known of the identity and relative abundances of the *Liriomyza* complex, their host plants, the parasitoid complex, or effects of insecticides on parasitoids. To better understand, manage, and develop biological control programs for *Liriomyza* species in the Lower Rio

Grande Valley, an intensive survey will be conducted to identified the leafminer species found in the area, their preferred host crops, and their associated larval and pupal parasiotids on commonly planted vegetables. The effects of commonly used insecticides on the parasitoid complex will also be studied in hopes of developing effective integrated approaches to *Liriomyza* management.

SP-04 Michal Roberts, West Texas A&M University, and Gerald Wilde, Kansas State University

Ecological assessment of arthropod populations in relation to different tillage and Roundup Ready cropping systems.

The effects of different tillage and herbicide practices on arthropod populations occurring on various field crops and the possible effects of Roundup Ready crops (RR's) on target and nontarget organisms are an area receiving widespread interest and concern. Research has shown different tillage practices can influence arthropod populations. RR's may indirectly impact arthropod populations by affecting various organisms that make up the food chain in an agroecosystem. The indirect effect of different weeds may also affect the pest and beneficial arthropods occurring in these systems. All of these factors need to be studied in detail in order to ascertain the overall total effect of a particular management system. We evaluated the effects of these factors by sampling from three target areas. Above ground fauna were evaluated using crop specific sampling techniques. Ground dwelling organisms were sampled using pitfall traps. Numbers of below ground organisms were assessed by recovering them from soil cores using Tullgren-type funnels. In general, preliminary results suggest there were no significant differences among arthropod populations under different tillage and RR practices.

SP-05 Eric Knutson and David Richman, New Mexico State University

Spiders on saltcedar as predators of the biological control agent *Diorhabda elongata.*

Since its introduction, the invasive weed saltcedar (*Tamarix* sp.) has come to dominate the landscape over the West's major water systems. Research has shown that introduction of the beetle *Diorhabda elongata* is a useful biological control agent in saltcedar management. However, possible native predators may play a role in limiting the beetle's success in the southwest. One such predator group is spiders. The goal of this project is to investigate the role spiders inhabiting saltcedar have on *Diorhabda elongata*. The objective of the first year of the project was to isolate which spiders on saltcedar pose a threat to the beetle's success. Since the first field season has already been completed, a preliminary list of the spider genera found on saltcedar and some initial results of the field season will be presented. First year results have affected the direction of this years work methods which will be discussed.

SP-06 Madani Telly and Bonnie Pendleton, West Texas A&M University

Resistance of stored sorghum to maize weevil (Coleoptera: Curculionidae)

Weevils are the most destructive insect pests of grain on farms and in commercial storage especially in warmer, humid regions of the world. Maize weevil, *Sitophilus zeamais* Motschulsky, is one of the most widely distributed and destructive insect pests of stored grain, including sorghum, Sorghum bicolor (L.) Moench. Adults lay eggs on grain in the field or storage, and larvae feeding inside grains can destroy 100% of stored grain. Modern technology has enabled conditioned-air storage, air-tight storage, and diverse drying methods, but such control tactics are not available or not used in many areas in the world, especially in developing countries. The goals of this research were to evaluate resistance of stored sorghum grain to the maize weevil and relate resistance to characteristics of the sorghum kernels. Five grams of grain were put into plastic vials in 10 replications for each of 20 genotypes of sorghum. The sorghum grain in each vial was infested with 5 maize weevils (three females and two males) and evaluated every 3 weeks. Numbers of live and dead weevils, number of new weevils produced, score of damage to grain, and weight loss of the grain were determined. The number of live maize weevils per gram of sorghum grain at 42 days after infestation ranged from zero to 0.8 ('Sureno') and 0.9 ('87EON366*90EON328'). Dead weevils per gram of sorghum grain at 42 days after infestation ranged from 0.02 for 'Sureno' and 'ICSR-939' to 0.12 for

'Tx7078'. The total number of maize weevils per gram of sorghum grain at 42 days after infestation ranged from 0.22 on 'Tx7078' to 0.92 on '87EON366*90EON328'.

SP-07 Stanley Gunawan, University of Texas at Tyler; Blake Bextine, University of Texas at Tyler

Symbiotic bacterium *Bacillus* in hemolymph of 4th instar larvae of red imported fire ant (RIFA), *Solenopsis invicta* Buren.

The red imported fire ant (RIFA), *Solenopsis invicta* Buren, is an exotic insect pest in Texas that has become well established throughout the eastern part of the state. RIFA are more aggressive than native ant species, gradually enlarging their range and spreading north and west despite intense efforts to stop them. It has become established that symbiotic bacteria have important relationship in the gut of 4th instar larvae of RIFA; however, the presence of symbiotic bacteria in hemolymph has not been explored. In this study, symbiotic bacteria were detected in the hemolymph of 4th instar larvae of RIFA. Hemolymph was harvested from RIFA and bacteria colonies were grown on tryptic soy broth (TSB). DNA from these bacterial colonies were then extracted, amplified through PCR assay, purified, and sequenced. Two different primer sets which amplified regions of the *gyrB* and SG850 genes were used to determine that species of *Bacillus* were present. Analysis of *gyrB* gene identified *Bacillus sp* with percentage match of 94-100% with DNA sequence from GenBank. Analysis of SG850 gene identified *Bacillus cereus* with percentage match of 93.30-99.26% with DNA sequence from GenBank. The contradiction in sequencing results between *gyrB* and SG850 genes occured because there was limited source of DNA sequence data available in GenBank for SG850 gene.

SP-08 Natalie Vitovsky, University of Texas at Tyler; Blake Bextine, University of Texas at Tyler

***Xylella fastidiosa* strain differentiation in vector insects based on *gyrase* B RFLP.**

Xylella fastidiosa is a xylem-limiting plant pathogenic bacterium that causes disease in many ornamentals and grapevines, and has caused extensive damage to the agricultural and ornamental industry in the United States. This bacterium is transmitted to host plants by xylophagous leafhoppers including the vector glassy-winged sharp-shooter (GWSS), *Homalodisca vitripennis*. Restriction fragment length polymorphism (RFLP) has been used to determine genetic diversity between *X. fastidiosa* strains. In this study, the *gyrase* B gene was analyzed using the restriction endonucleases TaqI and BsiWI, and the primer set BB: OUT F1 / BB OUT R1. This assay successfully differentiated two strains that occur in Texas, the Pierce's disease and ornamentals strains. The results of this study coincide with the strain differentiation found using melt curve analysis of Sybr QRT-PCR. This technique can be used to distinguish between known strains of *X. fastidiosa* allowing a rapid screening assay to determine the strain of *X. fastidiosa* in a vector insect or host plant.

SP-09 Carol Nuñez Vazquez, Universidad Autonoma Agraria Antonio Narro (Mexico); Julio Rivero, Royal Ontario Museum (Canada)

Some Mantodea from Southeastern Mexico.

I revised the Mantodea at the Entomological collection at the Instituto Tecnológico de Conkal, Yucatán, México. Five families (Mantoididae, Acanthopidae, Liturgusidae, Thespidae, and Vatidae) and 8 géneros (*Mantoida, Acanthops, Liturgusa, Oligonyx, Stagmomantis, Phasmomantis, Phyllovates y Macromantis*) are reported from the Mexican states of Chiapas, Quintana Roo and Yucatan.

SP-10 Mukti Ghimire, Oklahoma State University; Thomas Phillips, Oklahoma State University

Utilization of various Lepidopteran hosts for development and reproduction of *Bracon hebetor* (Hymenoptera: Braconidae).
Bracon hebetor Say (Hymenoptera: Braconidae) is a gregarious larval ecto-parasitoid of several species of Lepidoptera that are associated with stored products. Host suitability was investigated for the development and reproduction of *B. hebetor* on 12 different lepidopteran species representing four families: Indianmeal moth, *Plodia interpunctella*, Mediterranean flour moth, *Epesthia kuehniella*, almond moth, *Cadra cautella*, rice moth, *Corcyra cephalonica*, navel orangeworm, *Amyelois transitella*, greater wax moth (laboratory reared and commercial), *Galleria mellonella* (all Pyralidae); tobacco budworm, *Heliothis virescens*, corn earworm, *Helicoverpa zea*, beet armyworm, *Spodoptera exigua* (all Noctuidae); webbing clothes moth, *Tineola bisselliella* (Tineidae); and Angoumois grain moth, *Sitotroga cerealella* (Gelichiidae). Experiments were conducted using Petri-dishes (100 × 15mm) as experimental arenas. *Bracon hebetor* females were introduced singly into arenas and given a single host larva every day for five consecutive days. Paralysis of host and oviposition by *B. hebetor* females were significantly affected by host species. Daily fecundity was highest on *G. mellonella* (21.45 1.16) and lowest on *T. bisselliella* (2.36 0.26). The egg-to-adult survivorship and progeny sex ratio were also significantly affected by the host species. The highest percentage of parasitoid survival was on *A. transitella* (84.07 ± 2.26) and zero on *T. bisselliella*. Our results show that *B. hebetor* females can use a wide range of Lepidopteran hosts for paralysis and oviposition. However, *B. hebetor* can not necessarily develop and reproduce on all host species that it can paralyze. The possible application of these results for biological control of stored product insects is discussed.

SP-11 Aika Choudhry, University of Texas at Tyler; Blake Bextine, University of Texas at Tyler

96-well extraction technique for efficiently extracting *Xyllela fastidiosa* DNA from GWSS.
Xylella fastidiosa (*Xf*) is a xylem-limited bacterium that can cause disease in a wide range of plant hosts, including the Pierce's disease of grapevines and citrus variegated chlorosis (CVC). Diseases caused by this pathogen threaten the wine grape and citrus industry in Texas. The primary insect vector of *X. fastidiosa* in Texas is the glassy-winged sharpshooter (GWSS), *Homolodisca vitripennis*. GWSS is polyphagous; feeding on a wide variety of ornamental, agricultural and native plant species. Grapevines are susceptible to the strains of *X. fastidiosa* that occur in Texas; however, the strain that causes CVC has not yet arrived in Texas. As GWSS is a major vector in both systems, a protocol that can simplify the detection of this pathogen in *H. vitripennis* is needed for early detection of the pathogen. In this study, different protocols were used to extract DNA from the insect mouthparts and foregut. The method that was most efficient, inexpensive and that allowed to extract a large sample size was the 96-well extraction technique used in conjunction with a silica-based DNA binding matrix. This extraction technique makes it economical feasible to screen a large number of insect samples to determine the presence or absence of *X. fastidiosa*, followed by strain identification.

SP-12 Yi-Chern Lin, **University of Texas at Tyler; Brian Jackson, University of Texas at Tyler; Blake Bextine, University of Texas at Tyler**

Potato/Tomato Psyllid (*Bactericera cockerelli*) biotypes differentiation and symbiont detection.
Zebra chip (ZC) is a newly emerged disease of potato crops in Central and North America. ZC causes discoloration and deformation of potato tubers, which drastically reduce quality. The causal agent of ZC is still unknown; however, presence of the potato/tomato psyllid (*Bactericera cockerelli*) has been circumstantially associated with the disease. Psyllids may be involved in ZC directly (by inserting toxic saliva while feeding) or indirectly (by serving as a vector for microbial agents). Two biotypes of psyllids can be distinguished by the mitochondrial gene cytochrome oxidase I (COI) and internal transcribed spacer 2 (ITS2) and may account for variation in ZC symptom severity. This project has two objectives, first to genetically assess psyllid biotypes using COI and ITS2, and second to screen psyllids for *X. fastidiosa* and phytoplasma which are putative ZC pathogens. Two biotypes were observed in samples collected from the

US and Central America based on COI analysis. *X.fastidiosa* and phytoplasma, were detected inconsistently in psyllids populations by PCR.

SP-13 Danielle Tufts, University of Texas at Tyler; Blake Bextine, University of Texas at Tyler

Differentiation of monogyne and polygyne RIFA colonies using SYBR® green based QRT-PCR.
Solenopsis invicta Buren, the red imported fire ant (RIFA), is an introduced ant species that is especially dangerous to native species of ant and other wildlife due to their extremely aggressive behavior and large colony size. *S. invicta* colonies are found in two forms, monogyne (having a single queen) and polygyne (having multiple queens). In this study, QRT-PCR primer sets were designed to determine whether colonies are of the monogyne or polygyne structure by amplifying a portion of the Gp-9 gene which contains multiple single base pair alterations. Utilizing theoretical based melting temperature analysis, differentiation between monogyne and polygyne genotypes were determined using SYBR® Green based melting temperature analysis. Empirical testing is consistent with theoretical results and screening of Texas populations using this assay is now feasible.

SP-14 Joyce Parker, New Mexico State University; David Thompson, New Mexico State University

Effects of insect herbivory on swainsonine in locoweed species.
Locoweeds, *Astragalus mollissimus* Torr. and *Oxytropis sericea* Nut., are native rangeland weeds that cause significant damage to livestock in the western United States. *Astragalus mollissimus* and *Oxytropis sericea* contain the indolizidine alkaloid, swainsonine, which causes locoweed poisoning. Once consumed by vertebrates, swainsonine can cause the condition known as locoism, which has severe consequences including depression, abortion and death. Several native insects have been observed feeding on locoweed roots and stems. One of the most common, *Cleonidius trivittatus* (Say), the four-lined locoweed weevil, is being studied to determine if herbivory influences swainsonine content. *Cleonidius trivittatus* were collected in stems and roots of *Oxytropis* plants collected in Larimer County, Colorado and in stems and roots of *Astragalus* plants collected in Union County, New Mexico. Eggs and larvae were placed in an artificial locoweed diet to determine optimum conditions for rearing adults. Field collected and reared adults were used in choice and no choice experiments to determine if herbivory affects swainsonine levels. Young seedlings of *A. mollissimus and O. sericea* were collected in Union County, New Mexico and grown in a greenhouse under drip irrigation. Mature plants in the field were sampled for insect damage including past, current and no damage. Swainsonine was extracted from field plants and greenhouse plants experiencing different levels of herbivory damage using cation exchange chromatography and analyzed using liquid chromatography mass spectrometry. Results from field samples showed no significant differences in swainsonine levels between plants with signs of insect damage and those with no damage. In another study plant size did not influence swainsonine levels regardless of insect damage. Results of these experiments will add to the knowledge of biological control as an option for managing locoweed.

SUBMITTED ORAL PRESENTATIONS (Crop protection):

CP-01 Brett Highland, Paul Walgenbach, Helene Chiasson, AgraQuest, Incorporated

QRD 400, a novel plant extract for plant insect and mite management

Advances in isolation and identification techniques in recent years has led to the increased discovery of novel plant compounds. The area of biopesticides has benefited from this, leading to the discovery of QRD 400, a plant extract derived from *Chenopodium ambrosioides* var. *ambrosioides*, a plant closely related to common lambsquarter. The extracts, made up of mono-terpenes and sesquiterpenes, work in concert, via several modes of action, to control a broad range of soft bodied insects. Extensive testing at from 0.25% to 2% v/v in field and greenhouse environments have shown QRD 400 to provide good control of a broad array of soft bodied insect and mite pests. In the greenhouse QRD 400 has provided control of thrips, mites, whiteflies, mealybugs and fungus gnats. No known problems with any mix partners have been noted (to date). QRD 400 has been shown in trials to be safe for beneficials, and its different mode of action makes it an excellent rotation partner for resistance management. This product shows immediate and residual control of pests through dual modes of action. It is less persistent in the environment than many synthetic chemistries, and controls immature and adult stages. QRD 400 has been shown to be effective for use against pests prone to resistance. Plant testing at labeled rates across an array of common greenhouse plants has indicated little potential for it to cause any adverse plant effects or phytotoxicity. Field testing indicates that QRD 400 has particularly good activity on thrips and mites. Other insects controlled in field trials include whiteflies, aphids, leaf miners, mealybugs, and sod webworms. In the field QRD 400 will have a fit on fruits, vegetables and tree and vine crops. QRD 400 has multiple modes of action, is safe to many beneficial insects, is short lived in the environment,t and is safe to mammals. It is pending US EPA approval, with potential for OMRI/IMO/NOP certification.

CP-09 Christian Nansen, Texas Agricultural Experiment Station; Peter Edde, Montana State University; Thomas Phillips, Oklahoma State University; Greg Cronholm, Texas Cooperative Extension Service

Weather-based risk warning system for pests in agriculture

The concept of developing weather-based risk warning systems in extension and research discussed. As an example, and on-going effort is described in which weather data were used in regression models of trapping data of two important stored grain beetles, *Rhyzopertha dominica* (F.) (Coleoptera, Bostrichidae), *Cryptolestes ferrugineus* (Stephens) Coleoptera:Laemophoeidae). Subsequently, these regression models were used in GIS models to generate weekly maps of beetle flight activity across the state. The objective of this project is to provide consultants, extensionists and grain elevator managers with information about when, based on weather conditions, inspection of grain stores is most appropriate. The potential of applying this approach to field cropping systems in the southwestern part of the US is discussed.

CP-10 Drew Palrang and Shane Hand, Bayer CropScience

Flubendiamide: The next generation in Lepidoptera pest management.

Flubendiamide is a new, lepidopteran insecticide that is being developed by Bayer CropScience for use in a broad number of annual and perennial crops. Researched under the experimental code number NNI-0001, flubendiamide is the first member of a new chemical class, the phthalic acid diamides. The novel biochemical mode of action of flubendiamide exhibits excellent larvicidal activity as an orally ingested toxicant by targeting and disrupting the Ca^{2+} balance. This results in rapid cessation of feeding and extended residual control, providing superior plant protection against a broad-range of economically important lepidopteran pests, including *Helicoverpa* spp., *Heliothis* spp., *Spodoptera* spp., *Plutella* spp., *Pseudoplusia* spp., *Trichoplusia* spp., and *Agrotis* spp. As a new mode of action, flubendiamide exhibits no cross-resistance to conventional chemistries. Experiments in North America have shown flubendiamide to be hydrolytically stable, relatively immobile in soils, practically non-detectable in key rotated crops, mobile in

the xylem following penetration into plant tissue, and exhibits strong rainfast characteristics due to the unique chemical properties. Flubendiamide has a favorable ecological, ecotoxicological and environmental profile with low acute mammalian toxicity and no genotoxic, mutagenic or oncogenic properties noted. Flubendiamide will have an excellent fit in Integrated Pest (IPM) and Insecticide Resistance Management (IRM) programs in a variety of crops because of the many favorable characteristics, including selective activity against a broad range of lepidopteran pests, a new mode of action, safety to pollinators and beneficials, a favorable environmental and ecological (low toxicity) profile, short REI/PHI, and low use rates for less environmental loading.

SUBMITTED ORAL PRESENTATIONS (Biological Control):

BC-03 Vanessa Carney, Jerry Michels, Jr., and David Jurovich, Texas Agricultural Experiment Station

Spatial vs. traditional analysis of weed biocontrol efforts: Is the tape measure on the endangered list?
Traditional invasive weed and insect biological control agent monitoring can be time consuming, costly and labor-intensive. Practices involving linear transect sampling provide relatively low return on a monitoring investment, particularly when trying to understand target plant and bio-agent spread and establishment. In the field of biological control, GPS data collection and GIS analysis techniques are replacing clipboards, tape measures and topographic maps as standard resources. Information that is gathered in a spatially-relevant manner allows biological control practitioners to identify key environmental influences affecting the efficacy of insect release efforts. This presentation will contrast information typically obtained from traditional transect vegetation sampling methods against data collected and evaluated using GIS. Weed and insect population patterns that are readily apparent using a spatial approach, such as “hotspots” and patchiness, edge effects and directional trends, are generally unseen using traditional data collection techniques. GIS analysis and spatial modeling allow for an improved, more predictive approach to biocontrol agent release. These concepts will be discussed using knapweed, leafy spurge and Dalmatian toadflax biocontrol field data from military installations in Colorado and Wyoming.

SUBMITTED ORAL PRESENTATIONS (Biology / Ecology / Behavior):

BE-02 Christian Nansen, Agricultural Experiment Station; Paul Flinn, USDA-ARS

Stored grain beetles relationships when food availability is unlimited.
This study is based upon an exhaustive sampling effort in which 8011 grain samples were collected in 1999-2001 from a very large number of grain silos in Kansas. Of these samples, 1118 contained at least one individual of the following three beetle species: *Rhyzopertha dominica* (F.) (Coleoptera, Bostrichidae), *Cryptolestes ferrugineus* (Stephens) (Coleoptera:Laemophoeidae), *and Tribolium castaneum (Herbst)* (Coleoptera: Tenebrionidae), which are among the most common insect pests found in wheat stored in Kansas. The main objective was to develop simple regression models of the interspecific relationships and discuss them in a biological context. We found that: 1) 13-27% of the variance associated with beetle counts of one species in 1118 grain samples could be explained by counts of two other species which suggests that strong interspecific relationships are present, 2) high dominance of *T. castaneum* appeared to adversely affect both *R. dominica* and *C. ferrugineus*, 3) high dominance of *C. ferrugineus* appeared to adversely affect *T. castaneum*, 4) both *R. dominica* and *T. castaneum* densities showed strong indications of optimum density response and that they were adversely affected by very high densities of other species, and 5) in all three models, mainly linear effects accounted for most of the highly significant fits. However, also linear interactions contributed significantly to the model fits and underscored the importance of analysing individual beetle population dynamics on a community-level.

BE-03 G. J. Michels Jr., V. A. Carney, E. A. Jones and J. B. Bible, Texas Agricultural Experiment Station

Carabid beetles as indicators of variation in Riparian Habitats: A preliminary look
Pitfall trapping of carabid beetles was conducted in three riparian habitats in the Lake Meredith, TX, area in 2005, where we are conducting a biological control of salt cedar project. The three habitats were, a salt cedar free area, a salt cedar infested area and a recently burned salt cedar area. Collections made in the first year indicate that total species, unique species and species diversity were highest in the burned area, followed by the salt cedar free area, and finally the salt cedar infested area. Trapping was continued in 2006, although identifications of the beetles are pending, and will continue in 2007.

SUBMITTED ORAL PRESENTATIONS (Urban and Other):

UO-01 Michelle Niña Leddel, Century High School, Alhambra Unified School District (retired)

Multi-grade and multi-discipline activities in the study of cochineal scale insects (Homoptera: Coccoidea: Dactylopiidae: *Dactylopius* spp.).
The cochineal (*Dactylopius coccus* Costa) scale insect has been used as a source of red dye for over two thousand years, however there is limited, correct, public knowledge of it. To bridge that gap, educational lessons that attract, educate, and inspire people, especially young students, are addressed. The multi-discipline approach explores activities in science, history, art, Internet research, writing, desktop publishing, and community outreach.

UO-02 John Jackman, Texas A&M University

Reaching students outside the department with a course on aquatic entomology for anglers.
The Department of Entomology at Texas A&M University now has a course entitled Aquatic Entomology for Anglers. The course consists of one lecture and two labs per week. The content is beginning entomology particularly topics of interest to fly fishermen. During the labs, students learn to tie flies to imitate the various insects and other prey that are fish food items. Successful labs demand a small class size and are material intensive. This 3 credit course has been taught 3 times now with great interest in students across the entire campus. Most of the students are from agriculture, wildlife science, and entomology. However, students from a wide variety of disciplines such as sociology, material science, and finance have taken the course.

SUBMITTED ORAL PRESENTATIONS (Medical /Veterinary):

MV-01 David Pledger, Texas A&M University-Kingsville; and Craig Coates, Texas A&M University

Genetic based approaches to mosquito-borne disease control
Mosquitoes are resposible for vectoring many diseases the cause significant mobidity and mortality in human and animal populations across the globe. To augment conventional means of mosquito and disease control, genetic approaches to the interuption of mosquito-pathogen interactions which lead to disease are currently under study. The use of class II transposons is a key component of these efforts through their use for gene transfer, functional genomics analyses, and as a gene drive mechansim for the propagation of recombinant effector genes in wild populations. The use of transposons for these purposes is hindered by suboptimal transpositional activity for all transposons that have been studied in mosquitoes. Our investigations of the *Mos1 mariner* transposon show that certain DNA sequences within the transposon make important *cis* contributions to transposition. The results of our studies also indicate that it is possible to produce mutant *Mos1* transposons that demonstrate hyperactive rates of transposition. The use of such

hyperactive transposons may lead to the alleviation of the limitations of suboptimal transpositional activity in mosquitoes, and thus facilitate the further development of genetic based methods of mosquito-borne disease control.

SYMPOSIUM PRESENTATIONS (Pierce's disease: Impacts on Texas Agriculture)

PD-01 Forrest Mitchell, Texas Agricultural Experiment Station; Blake Bextine, University of Texas, Tyler

Distribution and abundance of possible *Xylella vectors* in Texas vineyards.
Xylem feeding insects were collected from Texas vineyards in the years 2003-2006. Species distribution and abundance were noted and selected samples were removed from the sticky traps used to collect them. These insects were then subjected to PCR to detect the presence of *Xylella fastidiosa*, the causative agent of Pierce's disease of grape. Results indicate that spread of the disease in Texas grape may be secondary, from plant to plant within vineyards. This opens up the possibility of management via insecticide and plant roguing.

PD-02 Natalie A. Hummel1, USDA-ARS, Frank G. Zalom, University of California, Nick C. Toscano, University of California, Prabir Burman, University of California and Christine Y. S. Peng, University of California

Seasonal patterns of female *Homalodisca coagulata* (Say) reproductive physiology in Riverside, California.
Female *Homalodisca coagulata* (Say) were collected from October 2001 to February 2005 from citrus at the University of California, Riverside. Between five and twenty females per sampling date were dissected, and each was assigned an ovarian rank: previtellogenic, vitellogenic or postvitellogenic. Ovarian rank was assigned to field collected individuals based on a specific set of morphological criteria which included the stage of oöcyte development. A principal component analysis of morphological and physiological characteristics suggested that the ovarian ranks reflected the reproductive status of the females. Ovarian ranking was used to characterize *H. coagulata* reproductive activity. Results of these dissections revealed consistent annual patterns in the proportion of previtellogenic females present in this field population. These patterns indicate that there are two distinct generations annually, with an occasional third generation. A step-wise regression model of *H. coagulata* vitellogenesis cycles in southern California was developed, which makes it possible to predict the appearance of the subsequent generation based on previous observed peaks in oviposition activity. Understanding reproductive status and patterns is critical for determining the optimal time to implement control methods to suppress *H. coagulata* populations in southern California.

PD-03 Phillip G. Mulder Jr and Kelly S. Seuhs, Oklahoma State University

Monitoring vineyards for possible vectors of Pierce's disease in Oklahoma.
The greatest potential for encroachment of the glassy-winged sharpshooter, *Homolodisca coagulata* and other potential vectors of Pierce's Disease in Oklahoma is likely near the Arkansas and/or Texas border. With this in mind, we monitored six well-established vineyards located near high-risk areas. Sampling was conducted using yellow sticky cards and sweep nets. During the trial period, from April 1 to October 1, we recovered over 10,000 and 20,000 leafhoppers in 2003 and 2004, respectively. No glassy-winged sharpshooters were recovered. In addition, no *Draeculacephala minerva* were recovered; however, *Graphocephala atropunctata*, an additional potential vector was recovered. Numbers of G. atropunctata were relatively low compared to more common species like *Empoasca fabae* and *Erythroneura* comes. In 2003, these latter two insects represented the dominant species captured on traps and in sweep samples, constituting 30% and 44%, respectively of the total leafhoppers captured. In 2004, *Cuerna lateralis* and *E.*

fabae constituted 44% and 24%, respectively of the total leafhopper population recovered. Since the adjacent agroecosystem for many of the sites sampled consisted primarily of wheat and/or alfalfa, we feel these crops served as a sink for high populations of E. comes and E. fabae. Harvest operations in those initial locations likely encouraged movement into adjacent vineyards. To date, no Pierce's Disease has been recorded on grapes in Oklahoma. In 2003 and 2004, petiole analyses conducted at 17 and 18 sites, respectively revealed no confirmed (DNA-PCR) cases of the disease.

PD-04 John Goolsby, USDA-ARS; Jeff Skevington, Agriculture and Agri-Food Canada; Blake Bextine, University of Texas at Tyler

Exploration for biological control agents in the native range of glassy-wing sharpshooter.
Surveys in the native range of *Homalodisca vitripennis* are continuing to discover nymphal parasitoids and to determine the ecology and phenology of glassy-winged sharpshooter in undisturbed natural areas. Fifteen sites with stands of native *Vitis* spp. in southeastern Texas have been surveyed monthly from October 2005 to present. The focus is on big-headed flies (Pipunculidae), which are known to be nymphal parasitoids of sharpshooters. Several methods have been used to survey for the parasitic flies, including yellow sticky cards, malaise traps, sweeping, hand collection, and tethered nymphal sentinels. Larval pipuculids have been dissected from hand collected *Oncometopia orbona* feeding on mustang grapes. Numerous adult *Eudorylas* spp. have been collected by sticky traps, sweeping, and malaise traps that may be associated with *H. vitripennis*. Peak populations of Pipunculidae, including *Eudorylas* and *Tomosvaryella* spp., occurred in February and October. Populations of *H. vitripennis* began to increase in March and peaked in July. *Homalodisca vitripennis* adults collected in March from survey locations were all positive for the presence of *X. fastidiosa* in their foreguts.

PD-05 Isabelle Lauziere, Texas Agricultural Experiment Station; Simon Sheather, Texas A&M University;Forrest Mitchell, Texas Agricultural Experiment Station

Spatio-temporal distribution of *Homalodisca vitripennis* populations breeding near vineyards in Texas.
A 2-year survey of xylem fluid feeding insects (Hemiptera) exhibiting potential for transmission of the bacterium causing Pierce's disease of grapevine was conducted in 2004-2006 in the Central Texas Hill Country grape growing region. One of the objectives of this study was to determine the distribution of glassy-winged sharpshooter adults, *Homalodisca vitripennis* (Hemiptera: Cicadellidae), through seasons in different habitats. This insect pest was the most abundant confirmed insect vector we captured in this area. Glassy-winged sharpshooter counts differed statistically significantly across time and were cyclical. 60% of captures took place between June and August. Interesting observations were also made when comparing trap counts for traps placed inside and outside vineyards. Adults were caught in significantly higher numbers inside the vineyards throughout the grape vegetative season, whereas they were caught in significantly higher numbers in the habitat surrounding the vineyard in the fall and winter months. Residual populations overwintering in different habitats and overwintering behaviors exhibited by this insect are the focus of additional studies in our region.

PD-06 Blake Bextine, University of Texas at Tyler; John Goolsby, USDA-ARS

***Xylella fastidiosa* in Texas: Implications of a multiple vector, strain, and host plant system.**
Xylella fastidiosa (*Xf*) causes Pierce's disease (PD) of grapevine and is the single greatest limiting factor affecting grape production in the US. The recent establishment of *Homalodisca vitripennis* (*Hv*), an invasive vector species, in California has resulted in new epidemics of PD across the state. Much effort has contributed to understanding the relationships between *Xf* and *Hv*. However, *Xf* is transmitted by multiple vectors which impact the dispersal of the bacterium. This is especially true in the southwestern US, where *Hv* originated. Understanding the impact of multiple vectors, multiple *Xf* strain with variable host ranges, and host plant system will lead to management of this disease in different regions of the US.

PD-07 Jeff Brady, Texas A&M Experiment Station

Detection and genotyping of *Xylella fastidiosa* by RT-PCR.
Recent multigene sequencing efforts have helped differentiate subspecies of *Xylella fastidiosa* and have provided sequence information for the subspecies at multiple loci. While sequencing allows discrimination between subspecies, this method can be both costly and laborious. The aim of this study was to develop an inexpensive, single reaction real-time PCR assay for use on environmental samples that will detect the bacterium efficiently while simultaneously providing genotype information to discriminate between subspecies. Primer/probe combinations targeted to several loci have been developed and are currently being evaluated for these purposes.

PD-08 Lisa Morano and Blake Bextine, University of Texas, Tyler

Genetic diversity of *Xylella fastidiosa* isolates extracted from Texas plants.
Given the great number of plants in south Texas that host *X. fastidiosa* there is strong evidence that this bacterium has been present along the Gulf Coast for thousands of years. Despite the clear need to analyze the strain diversity of *X. fastidiosa* in Texas there has been nothing published on *X. fastidiosa* strains from this region. Specifically the goal of this project were to analyze the X. fastidiosa cultures from a diversity of plants, both infected grapevines with PD and potential reservoir plants surrounding vineyards. By utilizing the gyraseB and mop sequences in our initial strains we determined that there are two main strains of *X. fastidiosa* in Texas, a grape strain very similar to the Temecula strain in California and a ragweed strain which appears similar to the California multiplex strain. Comparison of small sequence repeats (SSRs) between strains also suggests there are multiple genotypes of grape and ragweed strains in and around Texas vineyards.

SYMPOSIUM PRESENTATION (Urban Entomology and Outreach Programs)

UE-01 Robert Davis, BASF Specialty Products

Urban entomology and outreach programs.
A symposium on "Urban Research, Extension and Outreach Programs in the Southwestern Region" will allow researchers, extension professionals, and community outreach specialists to present information and findings from these important areas. We have in the SW branch some of the premier urban research and extension professionals in the country with extensive work being conducted by universities, private consultants, commercial concerns and extension groups. Urban related topics of interest in our branch may include industrial and structural pests, public health pests (fire ants), turf pests and ornamental pests. Attendees can include academic & research professionals, students, extension professionals, private concerns and pest control operators. This symposium will provide a vehicle for these professionals to present their information to the ESA community.

SUBMITTED POSTERS

P-08 Nagendra Babu Earle, West Texas A&M University; Gerald J. Michels , Jr., Texas A&M Agricultural Experiment Station; Bonnie B. Pendleton, West Texas A&M University

Assessment of wavyleaf thistle infestation and potential for biological control in the Texas Panhandle.
Wavyleaf thistle, *Cirsium undulatum (*Nutt Spreng), is a noxious weed in 42 states, including Texas. It is a recent invasive species in the Texas Panhandle because of vehicular traffic from northern states. This research emphasized biological control with the objectives of using Global Positioning System equipment

and Geographic Information Systems software to develop distribution maps and a database of infestation by wavyleaf thistle in the Panhandle, assessing biological control potential, and assessing interaction among biological, chemical, and mechanical controls for wavyleaf thistle. Areas of infestation ranged from 1-10,000 m^2 with an average of 36.8 m^2, and the distance from highways ranged from 1-60 m with an average of 2.3 m in the Panhandle. No infestation occurred at the borders of states except between Texas and Oklahoma. In 2006 we conducted field experiments with the following treatments; the flower head weevil, *Rhinocyllus conicus* (Froehlich), the bumble flower beetle, *Euphorbia inda* (L.), mechanical (cutting to the bottom), chemical (Banvel @0.33lbs ai/acre) and an untreated check. We concluded that the percentage damage to seeds caused by *Rhinocyllus conicus*, *Euphorbia inda*, and mechanical control were significantly greater than the un-treated check ($P<0.0001$, lsd=3.92). A greater percentage of damage to seeds was observed in case of *Euphorbia inda*, followed by *Rhinocyllus conicus* and mechanical control. The percentage of damaged seeds did not differ significantly between chemical control and the check. *R.conicus* could be the best biological control agent because *E. inda* is a generalist herbivore and pest on sunflower.

P-17 Aaron Hassell, Isabelle Lauzière and Forrest Mitchell, Texas Agricultural Experiment Station

Feeding preference of *Homolodisca vitripennis* (Germar) (Hemiptera: Cicadellidae) for native and introduced plant species common to the Edwards Plateau area of Texas.

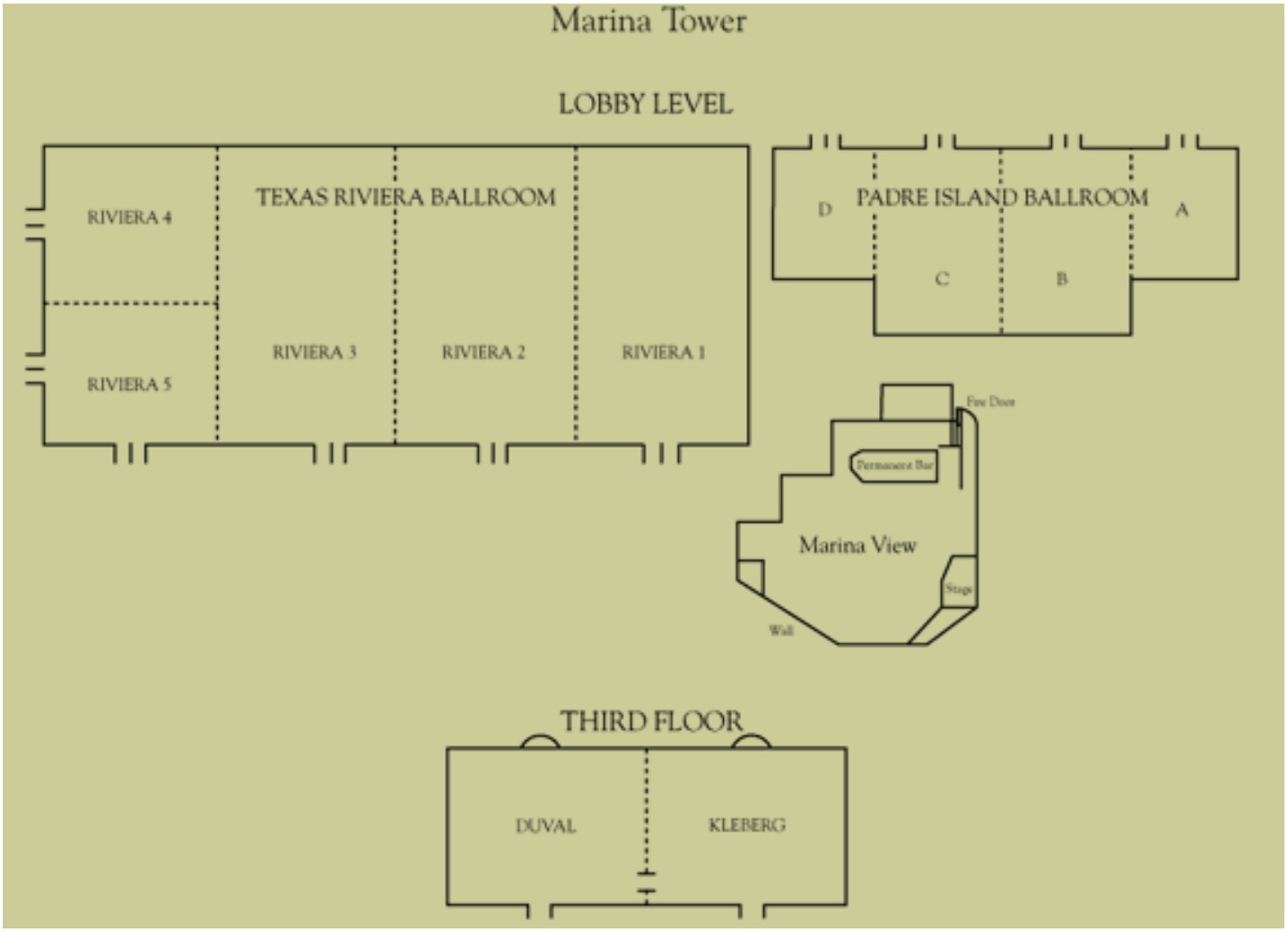
Observations were carried out from October through December 2006 on the dynamics of host plant utilization by the glassy-winged sharpshooter (GWSS), *Homolodisca vitripennis* (Germar), to determine feeding preference for different native and introduced plants common to Central Texas. Adult GWSS were placed into cages with one each of 10 different plant species. The insects were periodically quantified in reference to the plant they were found feeding on and percentages were calculated based on the total number of insects counted. Overall, sharpshooters were most abundant on *Ligustrum japonicum* (Oleaceae), *Nerium oleander* (Apocynaceae), *Lagerstroemia indica* (Lythraceae) and *Quercus virginiana,* (Fagaceae), respectively. Feeding preference varied through time. *Ligustrum japonicum* and *L. indica* were preferred in October, *N. oleander* and *L. japonicum* in November and *L. japonicum* and *Q. virginiana* in December. In December, a large percentage of GWSS were also observed on the walls or floor of the cage in the lieu of feeding on the plants. This study is part of a continuing research effort to assess vector biology and ecology in relation to seasonal temperatures and plant physiology and their effect on host plant preference and overwintering behavior. This is an ongoing study and we will continue our observations through late winter and spring of 2007.

P-27 J. Scott Armstrong, John Adamczyk, S. M. Greenberg, USDA- ARS, Beneficial Insects Research Unit

Fall Armyworm susceptibility to Bollgard® I, Bollgard® II, and Widestrike™ cotton as determined by a leaf-dish assay.

Some economic outbreaks of Fall armyworm *Spodoptera frugiperda* (J.E. Smith) have occurred in South and West Texas cotton production regions as boll weevil eradication progresses in to the second full season in the Rio Grande Valley of South Texas. Cotton varieties containing the endotoxins from *Bacillus thuringiensis* (Cry1Ac = Bollgard® , Cry1Ac + Cry2Ab = Bollgard II®, Cry1F + Cry1Ac = Widestrike™) are available to help producers avoid devastating economic losses from lepidopteran pests, however the adoption and use of this technology in South Texas has been limited. We evaluated the susceptibility of fall armyworms to the single (Bollgard I) and the stacked (Bollgard II and Widestrike) technology using leaf-tissue assay, and found that Bollgard II® and Widestrike™ are highly effective against fall armyworm in causing mortality and rendering the insect a non-threat by stopping their feeding, but Bollgard I was not significantly different from the check in terms of mortality or feeding. Our evaluations will continue to determine what the sublethal affects of the toxicants are on the biology of the fall armyworm, and to further evaluate the efficacy.

55th ANNUAL MEETING - SWB ESA



Floor plan of Omni Hotel Marina Tower
Corpus Christi, Texas