

NCCC46 Annual Meeting
Jan. 26-27, 2015
The Menger Hotel
San Antonio, TX

Participants:

- Boetel, Mark (mark.boetel@ndsu.edu) - North Dakota State University
- Bynum, Ed (ebynum@ag.tamu.edu) - Texas A&M University
- Coates, Brad (brad.coates@ars.usda.gov) - USDA-ARS and Iowa State University
- DiFonzo, Chris (difonzo@msu.edu) - Michigan State University
- Fisher, Kelsey (kefisher@udel.edu) - University of Delaware
- French, Wade (wade.french@ars.usda.gov) - USDA-ARS (Brookings, SD)
- Fuller, Billy (Billy.Fuller@sdstate.edu) - South Dakota State University
- Gassmann, Aaron (aaronjg@iastate.edu) - Iowa State University
- Gray, Michael (megray@illinois.edu) - University of Illinois
- Hellmich, Richard (Richard.Hellmich@ars.usda.gov) - USDA-ARS (Ames, IA)
- Hibbard, Bruce (hibbardb@missouri.edu) - USDA-ARS (Columbia, MO)
- Hurley, Terry (tmh@umn.edu) - University of Minnesota
- Jensen, Bryan (bmjense1@wisc.edu) - University of Wisconsin, Madison
- McManus, Bradley (Bradley.McManus@sdstate.edu) - South Dakota State University
- Mason, Chuck (mason@udel.edu) - University of Delaware
- Meinke, Lance (lmeinke1@unl.edu) - University of Nebraska
- Michel, Andy (michel.70@osu.edu) - The Ohio State University
- Mitchell, Paul (pdmitchell@wisc.edu) - University of Wisconsin
- Ostlie, Ken (ostli001@umn.edu) - University of Minnesota
- Porter, Pat (p-porter@ag.tamu.edu) - Texas A&M University
- Sappington, Tom (Tom.Sappington@ars.usda.gov) - USDA-ARS and Iowa State University
- Schaafsma Art, (aschaafs@uoguelph.ca) - University of Guelph
- Silva, Jose Paulo (jpgfdsilva@gmail.com) - University of Nebraska
- Spencer, Joe (spencer1@illinois.edu) - University of Illinois
- Smith, Jocelyn (jocelyn.smith@uoguelph.ca) - University of Guelph
- Tooker, John (tooker@psu.edu) - Pennsylvania State University
- Tinsley, Nick (tinsley@illinois.edu) - University of Illinois
- Velez, Ana Maria (avelezarango2@unl.edu) - University of Nebraska
- Wright, Bob (rwright2@unl.edu) - University of Nebraska
- Zukoff, Sarah, (snzukoff@ksu.edu) - Kansas State University

[Local arrangements, Ed Bynum and Pat Porter]

[NCCC46 Minutes taken by Joseph Spencer, Secretary]

Meeting called to order, 26 Jan 2015 at 8:00 am, Art Schafsma, Chair; John Tooker, Vice Chair
Local Arrangements (Ed Bynum): \$40 for NCCC46, \$40 Joint Meeting (\$40 NC205). All three for \$120.

Introductions:

2014 meeting minutes: approved with one correction.

Nomination committee (for Secretary) – Chuck Mason and Elson Shields will develop a list.

Time and place–

Brasilia has been suggested for 2016; discussion of motivations, airfare estimates (\$1200-\$1500) follows, agree to continue discussion with NC205 for eventual vote.

Additional Agenda Items:

- Reminder about returning Soil Pest Survey, distributed before meeting.
- Wade French introduced letter from Sharon Papiernik requesting input on support of corn rootworm colonies maintained at NCARL. Funding issues may lead to reduction of rootworm colonies that are a major resource needed for national research on corn rootworm. NCCC46 Group and/or individual letters voicing support were discussed.

Final NCCC46 project meeting details; merger to form new project (NC246) proposal update (Tom Sappington)

- NC205 ends 9/30/15; NC246 begins 10/1/2015. NCCC46 will not submit renewal and be allowed to expire. Committees will be fully integrated in Oct 2016; first meeting under new format in January 2017.
- Tom S. presented 205 and 046 governance structures 2014, 2015, & 2016. Above ground and below ground pest subcommittees are a favorable option. Current differences in leadership transitions for groups will lead to an extra officer if secretaries are chosen in 205 and 046. A motion was proposed and approved by vote that elected secretaries (serving a 2-year term) of both subcommittees will rotate to Lep (above ground pests) or Rootworm (below ground pests) subcommittee vice chairs (serving a 2-year term) and conduct subcommittee meeting with Sec'y. The following year, one vice chair becomes Chair and organizes the joint above ground and below ground session that occurs between the meetings, the other Vice Chair organizes the joint session the following year.

Recap of Activities and Influence: Significant communications with growers, seed/ grain-handling/processing industry, state regulators, commodity commissions, etc.

- Bob W. CRW Management Webinar is freely accessible on Plant Management Network under Focus on Corn.
- John T. Participated in Penn State Ag Committee hearings on GMO labeling.
- Pat P., Ed B. and Sarah Z. Industry is facilitating seed blend stewardship.
- John T. Leeland Glenna survey is published.
- Elson S. and Others. Discussion on improved research environment for GMO studies continues. Some Universities may not have full openness. Significant progress on openness, but many resistance issues are only public long after the fact. Company and representative-specific levels of communication vary. Lack of resistance data sharing slows appropriate management responses. Discussion of mitigating resistance is silly—it cannot be undone; growers are focusing on population management. Important that non-Bt hybrids be available for use with soil applied insecticides (SAI); group statement on CRW IRM may be needed in light of EPA draft guidelines for 'preventing' resistance.

Bt resistance in rotated corn – (Joe Spencer):

- Confirmed rotation-resistant WCR resistance to Cry3Bb1 and mCry3a in Livingston and Kankakee Co. in Illinois, reduced susceptibility in Champaign Co. Solicited comment on similar situations in other states. SAI is increasing in response.

Discussion on refuge theory for rootworms in Bt corn (led by Bruce Hibbard).

- All of the starting assumptions about WCR biology and Bt corn/refuge strategy were wrong—among these are Bt toxin dose and refuge:Bt populations. Refuges (block or blend) produce too few beetles, designs are not ideal and IPM is not occurring—poor application of CRW refuge hurts refuge concept in general. Is having no CRW refuge preferable to bad refuge? Integrated CRW refuge could select for ECB resistance. Could an entirely IPM plan work better where CRW populations are managed until high dose product is introduced with robust IRM+IPM plan from the beginning. Difficult to manage CRW and Lep pests in a way that is true to IPM/IRM for both. Issue is complex mixture of SCIENCE and POLICY; NCCC46 group must focus on SCIENCE and documentation to influence POLICY.
 - A motion was proposed and passed to develop a document that is circulated to the groups and eventually to EPA to highlight concerns about current refuge requirements, conditions, responses that do not serve CRW IRM and may be putting Lep pest at increased for resistance.

Bt bioassays on WCR – updates from around the Corn Belt (led by Art S.).

- Aaron G. ISU bioassays document resistance/cross-resistance to all Cry3 toxins, reduced susceptibility to Cry34/35 in some field populations with history of continuous corn as part of longer rotations. Pyramid issues can be attributed to Cry3 resistance.

Canada and neonicotinoids (NNi) (led by Art S.).

- NNi use in agriculture “is not always just a science agenda” issue; beekeepers are pitted against grain farmers; Canadian provincial politics are factoring in. There are new conditions to purchase NNi’s—seed and pesticide vendors are all treated like pesticide vendors. Use of NNi’s is being conflated with anti-pesticide movement.

Grubs, wireworms and millipedes – perception or threat.

- Chris D. lead discussion/analysis of the below ground soil pest survey results (14 responses). Among most commonly reported risks-Asiatic Garden Beetle, grubs, wireworms. Regarding changes in risk, some feeling that wireworms are an increasing issue. Overall, few growers scout, few thresholds are judged adequate. NNi’s provide some wireworm management; (Canada) anti-seed treatment/anti-pesticide movement will make pest management difficult. (ND) unpredictability of wireworms complicates assessment of treatment efficacy.

State Reports begin:

Objective 1: Coordinate the evaluation and reporting of registered and experimental management options, including rootworm-resistant transgenic hybrids and new classes of insecticide chemistry. These studies include not only efficacy, but also quantification of subtle impacts of management on rootworm biology, behavior, resistance management, and how these parameters may impact overall sustainability within the corn agroecosystem. For commercially-available products, this will include across-product, industry-wide comparisons.

Objective 2: Coordinate original research on rootworm biology, ecology, physiology, mating, dispersal, and survival, and potential changes in host range across environments and production systems. This includes **1)** characterizing rootworm ecology and trophic interactions in conventional production systems as well as those that include novel (biomass/biofuel) crops or genetically-modified host plants, **2)** characterizing the status and spread of behaviorally and/or physiologically resistant rootworms (and associated resistance alleles) and the patterns of gene flow within and between local and regional populations, **3)** applying the current

biological and ecological data to parameterize, evaluate and improve corn rootworm resistance modeling and IRM plans under different resistance management scenarios for transgenic corn hybrids, and 4) facilitating and encouraging coordination, preservation, and generation of WCR genomics resources, including preparation for a genome sequencing project.

Nebraska – Lance Meinke:

- 9 populations sampled/bioassayed in 2013/2014
- Lots of performance inquires, but less than 2013
- “Neighborhood” 3Bb1 problems noted; no evidence of Cry34/35Ab1 problems.
- More pyramids and crop rotation in use; increased SAI use. Hard to find fieldsites due to management for yield—not worrying about IRM.
- Some Bifenthrin (Capture) resistance in field; often used with pyramids

Minnesota – Ken Ostlie:

- A few CRW hotspots, but down overall. Pop shift toward NCR due to cold winter
- Estimates 50% of continuous corn with SAI on Bt traits, 25% of rotated corn with insecticide on Bt traits. There is an increase in scouting with desire to use non-Bt corn.

North Dakota – Mark Boetel:

- No confirmed 3Bb1 resistance. Alleged '13 Cry3Bb1 problem fields had dramatic pop declines to 5% WCR from 70% WCR in '13. Winter of '13/'14 saw 70d with temps below 0 F.

South Dakota – Billy Fuller:

- Downed fields were single traits w/o SAI.
- Poor grower access to non-Bt, non-NNi hybrids.

South Dakota – Wade French:

- Fields with problems exist; farmer believed there were extended diapause problems

New York – Elson Shields:

- 2013: three fields went down; nothing in 2014 in same fields
- More crop rotation in response to low corn prices

Pennsylvania – John Tooker:

- Three counties with Cry3Bb1 and mCry3a problems, but separated by mountains.
- Collected beetles were sent to Jocelyn S. for bioassay.
- Report on interesting Slug research (in soybean): Where you have neonicotinoids (NNi) in use, slugs are worse. Slugs eat NNi plants, carabids eat slugs and they are harmed. NNi's likely in gut contents since 'back slime' did not contain NNi.

Canada – Jocelyn Smith (reporting for Andrea Hitchon):

- 2013: 9 populations tested, no confirmed Canada resistance; one possible 2014 field.
- Diet bioassay optimization continues; some probs w/ contamination and high control mortality.

Michigan – Chris Difonzo:

- 2013 PI fields (2-Cry3Bb1 fields, 1-mCry3A); pops tested resistant to Cry3Bb1. mCry3A field was rotated in '14, others were SSX + SAI.

Kansas – Sarah Zukoff:

- DuPont's 'Indoxicarb' used for adult control in corn: 99% kill w/in 3h in lab, 95% kill in field w/ 4 week residual.

RNAi Topic

Nebraska – Ana Maria Velez:

- A few (n=5) introduced lethal genes are already in corn (work with DowAgrosciences)
- Looking at fertility and other CRW genes.
- RNAi risk assessment underway for bees; looks good because bees are hard to kill with RNAi.
- End of decade for commercialization.
- RNAi alone is a slow-to-kill product (never will be available alone); combined with Cry toxin makes for quicker kill. Eventually may have multiple RNAi's in pyramids

RNAi Comments:

Steve Bradbury (formerly of EPA):

- Highly specific RNAi effects will suggest focused testing targets.
- RNAi subject to degradation in human gut—less risk.

Delaware – Chuck Mason:

- What is the IPM strategy for RNAi; what will be available for used as part of IPM strategy?.

Nebraska – Lance Meinke:

- How will we convince growers not to use RNAi products as a silver bullet?

Canada – Art Schaafsma:

- Does NCCC46 need to address integration of RNAi into IPM?

Texas – Pat Porter:

- Any possible letter needs to address the RNAi dose issue; but we know little at dose.

Illinois – Michael Gray:

- Concern about pyramiding RNAi with already compromised traits.

Adjourned at 5:00 p.m.; reconvened at 8:00 a.m. on 27 Jan 2015

Nominations committee report:

- Chuck M. and Elson S. nominate Jocelyn Smith for NCCC46 secretary. She accepts nomination, Motion to vote is made and seconded, nominee is elected secretary for 2016 meeting by vote.

Time and Place committee:

- Tom Sappington and Terry Hurley propose Brasilia (Brazil).
- Discussion. Concern over cost. Motion is made to recommend Brasilia in 2016, is seconded.
- Airfare would be \$1200-\$1500, plus hotel. Noted that location is not conducive graduate student attendance—this is a problem when we leave the region, as we have for three years. Should the subcommittees meet separately in 2016?
- Timing and location would allow first-hand look at *Helicoverpa armigera* and resistant Fall Army Worm. Brasilia group is interested in NC205 like organization in Brazil.
- Vote on motion was Yea-2, Nay->>2; motion defeated. Time and place committee to find an alternative time and place with understanding that we need to discuss with NC205.

Other Business:

Re: Support for the Brookings Laboratory (NCARL) and maintenance of CRW colonies.

- Bruce H. suggested compiling list of grants and papers that depended on the CRW colonies.

Re: NCCC46/NC205 Organizational Chart (Tom S.):

- Below ground subcommittee = BwG; Above ground subcommittee = AbG
- Vice chair succession? – vote or decide between Vice Chairs or alternate chairs by year?
- AbG vice chair is chair of AbG subcommittee and runs that part of the meeting, same for BwG subcommittee.

Return to State Reports

Delaware – Chuck Mason:

- WCR is a cyclic problem (1 of 5 years). Grubs are occasional issue. Growing slug problems.

New York – Elson Shields:

- “Inoculative releases of entomopathogenic nematodes (EPNs) and multi-year persistence across crop rotation.
- Alfalfa snout beetle is managed with EPNs, can this work for CRW? Applications of *S. feltiae* in 2009 that have persisted through 2013 across multiple crops in rotation. Funded by grower supported groups in NY. These are easily reared on Wax Moth larvae—25 million EPN from 250 wax moth larvae: takes 3-5 years to establish EPN. “We have to get out of the pesticide mode”

Minnesota – Ken Ostlie:

- Comparing 5-different sticky trap captures in corn and damage the following year.
- Mixed species fields suggest species respond differently to traps.

Nebraska – Lance Meinke:

- New Faculty at North Platte (Julie Petersen) looking at native CRW biocontrol in NE.
- Multiple efforts to look at resistance mechanisms in CRW and new colonies.
- Weed science project looking at corn, weeds and WCR: phenological interactions with weeds may pull late WCR to weeds and increase late season fitness and egg laying around weeds.

Iowa – Brad Coates:

- Work on QTL map of OP resistance.
- WCR genome structure and work to assemble the genome.
- Work with Monsanto on improved genome library
- Work on physical map of WCR genome

Iowa – Aaron Gassmann:

- Landscape level look at 3Bb1 resistance: sample widely and randomly vs. use of past problem fields to guide choices for sampling.
- Studying variation in insecticide susceptibility in Iowa.

Iowa – Tom Sappington:

- Doing work to look at movement with methods that may offer improved detection of genetic structuring. Samples in the historic WCR home range are used to determine the geographic size of the WCR population. Wright’s genetic neighborhood idea is used. Sampling with whole plant

counts (54 plants/field) to get adult DNA. Wallace Co. KS was done in 2013. Also needed % are of corn in landscape. Cropscape at National Agricultural Statistics Service in cropland layer provides % data.

More discussion of meeting in Brasilia at Imbrapa facility in 2016, now with NC205 Chair, Tom Hunt:

- Pros and cons- cost of travel (\$1100-\$1500 roundtrip—direct flight to Brasilia from ATL); Ag Expt Stations may fund travel? There is a VISA cost of a few \$100s. NC205 had previously voted for this; group tends to go international once per decade. Would need approval of the NC committee of 9, then decision from Ag Expt Stations.
- Art S. asked time and place committee to come up with a 'Plan B' location.

Return to State Reports

Illinois – Michael Gray:

- There are few ECB in Illinois. There will be a focus on pest survey in 2015 with program changes—no efficacy trials. These reports are valued by growers, though financial support for them is declining.

Iowa – Tom Sappington:

- ARS has a mandate to review the need for NNI on corn, cotton and soy (meta-analysis of old and new data). 1-yr timeframe. Many past efficacy trials may be valuable data sources.

Texas – Pat Porter:

- There are issues with 34/35Ab1, but no documentation since growers approach consultants/technology providers before University.

Missouri – Bruce Hibbard:

- JAE articles detail a Glycerol Lipid as host acceptance compound.
- EU cooperation on EPN work w/ MO to develop EPN as an IRM tool for Bt corn. There are US corn lines that do emit Caryophyllene.
- Monsanto-funded diet study has produced beetles; contamination is a problem.
- R. Geisert work on eCry3.1Ab indicates R-trait has dominant inheritance.
- Working with MN looking for R-populations with all Bt-R assays; variable results, but increased resistance to Cry3Bb1, mCry3A and Cry34/35Ab1. No widespread 34/35 problems.

Wisconsin – Bryan Jensen:

- No report, but will continue efficacy trials.
- Resistance issues include poor communication from Industry; don't learn of problem fields.
- Lots of rotation in pockets with cont. corn.
- Few fields (out of 200) with more than 1 beetle per plant. Overall low beetle numbers.

Wisconsin – Paul Mitchell:

- Working with Monsanto on-farm project; only anecdotal Bt-R probs.

Kansas – Sarah Zukoff:

- High overhead on trials will reduce number of trials.

- CRW irrigation study, with and without Bt, drought tolerant hybrids to address how reduced water will affect CRW growth and development. A plant stress focus is included.

Wrap-up Work

- Impact Statements - Reminder to look at impacts in NIMMS system. Membership is to send paper lists and highlight some impacts.
- Brookings Lab Impacts:
 - ARS is not a service organization, need to document collaboration in publications. NCARL has had far-reaching impact on all aspects of CRW biology research. Please send pubs with input from Brookings lab to Wade F. and Bruce H.
 - Must remind ARS that this is research conducted on behalf of the Nation, for national good. Colonies are a research resource, used by Wade and others.
 - Severe cuts would impact ARS and collaborative (e.g. EU) research.
 - Motion to consult with Committee Advisor, Steve Pueppke, re: authoring a NCCC46 letter of support was proposed, seconded and approved by voice vote. Bruce H. will compose and circulate to extension group.
- **Time and Place committee report (Ken O. and Pat P.):**
 - Suggest Sioux Falls, SD-Billy F. would host.
 - Motion to go to Sioux Falls, SD in 2016 as a back-up if Brasilia is not supported was made, seconded and approved by vote.
- **NCCC46 meeting adjourned at 11:50 a.m.**

NC205/NCCC46 Joint Meeting, San Antonio, TX
January 27-28, 2015
The Menger Hotel
San Antonio, TX

[Local arrangements, Ed Bynum and Pat Porter]

[NCCC46 NC205 Minutes taken by Joseph Spencer and Tom Sappington, Secretaries]

Meeting called to order, 27 Jan 2015 at 1:30 p.m., by Tom Hunt (NC205 Chair)

Welcome - Tom Hunt, UNL (Chair NC205) & Art Schaafsma, Univ. of Guelph (Chair NCCC46)

Local Arrangements (Ed Bynum): \$40 for NCCC46, \$40 Joint Meeting (\$40 NC205). All three for \$120.

Introductions and General Announcements

Tuesday afternoon, January 27 (1:30 - 5:00)

OPEN SESSION

Status of Neonicotinoid Discussions in Ontario - Art Schaafsma, Univ. of Guelph:

- Treated seeds now classed as a pesticide.
- Many restrictive rules in place in Ontario: Is it about bees, neonicotinoids (NNi's), pesticide, anti-pesticide, in-season or overwintering bee mortality? What is REALLY going on?
- Dust from abraded seed is an issue, less visible drift of soil with residues (100x less NNi). Residues half-life in soil is 0.5-0.6 yr.
- Government target is to reduce acres treated by 80% in 3 yrs. Industry target to reduce non-target dust exposure by 80% in 3 yrs
- A maximum of 2% of NNi placed on seed is escaping the system; planting time dust is greatest contamination risk.
-

Perspectives on cost-benefit analyses for pesticide registration decisions, with a focus on the neonicotinoids - Steven P. Bradbury, ISU Visiting Scientist.

- EPA has a high-throughput decision-making process.
- Need 99.99% certainty that residues are safe. Cannot harm human health or Environmt.
- A tiered approach is used to characterize risk. In the future, a more probabilistic approach is envisioned.
- The agency doesn't have to be sure that there is no cost to consumers, but must keep risk low enough to keep risk:benefit lower. Not a cookie-cutter approach.
- Examples: Carbofuran was cancelled because the benefits did not justify the risk to birds. Guthion cancellation was delayed while alternatives were coming to market. NNi have low mammalian and avian toxicity; and are a low risk replacement for OPs and carbamates.
- What are the benefits of NNi? Soybean example: If no benefit, then there is no acceptable risk—easy to decide!
-

Value of Insect Pest Management in the USA and Canada: Where do Neonicotinoids fit in?, with Yield and Economic Benefits of Neonicotinoids - Terrance Hurley, Univ. of Minn, Paul Mitchell, Univ. of Wisc.

- "Project is an analytical framework of data triangulation"; 14 PhDs at work.
- Full report is available at GrowingMatters.org
- Document percentage acres treated with NNi's, primary NNi targets, non-NNi chemical use.
- 90% of NNi use is as seed treatments, 98% of NNi-treated acres are treated via seed trtmnts.

- Without NNI's, estimated that total yearly production costs increase by \$848 Million or \$7.30/acre.
- Farmer survey of 1700 farmers (1000 US, 700 Canada); most want NNI's as an option. 49% believe they are managing CRW with NNI's, 41% believe they are managing ECB with NNI's.
- Some disconnect—91%/92% of US/Canada growers plant CRW Bt seed; 62%/72% say they are using a NNI seed treatment; all CRW Bt seed is NNI-treated.
- 38% scout corn, 84% scout soybean—among these 52% and 69% say it was “deliberate”.
- Perceived value of Bt seed treatment to corn growers is \$13.38/a compared to \$20/a for Bt traits, \$12.9/a for SAI, and \$14.9/a for foliar insecticide.
- North American value of seed treatment is estimated at \$1.4 Billion.
- Overall benefit of NNI to crops is 4.4% in corn, 0.2% in soybean.
- Without NNI's, corn would cost \$0.25/bu more.
- Question: what is the ecological relevance of NNI's to groundwater?

CLOSED SESSION

Pioneer/DuPont Discussion of seed treatments and CRW IRM - Clint Pilcher et al.

Adjourned at 5:00 p.m., reconvened at 8:00 a.m. 28 Jan 2015.

OPEN SESSION

Administrative Report - Steve Pueppke, MSU (via Skype):

- NCCC46-NC205 merger is on track.
- 1 October 2015, new NC246 will begin. NCCC46 will continue and expire on 30 September 2016. Amended governance proposal (succession of officers) should be sent to Steve for inclusion into packet for Chris Hamilton.
- Meeting location in Brasilia? Need vote of Appendix E members. Alternative site has been suggested (Sioux Falls, SD). Neither would have approval issues.
- Other issues that are not on the radar?
 - Letter to highlight need for IPM in IRM
 - Brookings Lab possible funding reduction—how to provide input? Diplomatic letter to USDA/ARS.
 - Hibbard sponsored letter suggesting that refuge for low-dose products may do more harm than good for Lepidopteran pests in this system. CRW refuge threatens Lep trait IRM.

Brazil Meeting in Jan 2016 discussion (lead by Tom Hunt):

- Need ca. \$200 Visa (takes two weeks, good for 10 yr)
- Airfare is ca. \$1100-\$1600; USDA must stay in certified hotel.
- January is in Brazilian growing season
- Web conferencing is possible in both directions.
- Other issues that are not on the radar?

Possible Workshop at the IPPC in Berlin, Germany August 24-27, 2015 (lead by Tom Hunt):

- Workshop on movement and IRM sponsored by NC205
- Early registration closes in late Feb.

EPA proposal to address key SAP recommendations for corn rootworm and changes to the current resistance monitoring program - Jeannette Martinez, EPA:

- New docket is now open regarding changes to CRW resistance monitoring program: (Docket #14P-0274; notice of availability is: OPP-2014-0805)
- 5 elements: 1) Use IPM approach for CRW resistance management, 2) Implement proactive methods to detect resistance, 3) Remove random sampling, 4) Adopt on-plant bioassays-drop diet bioassays, and 5) Enhance current remedial action plan.
- 1) Refuge alone is insufficient to manage resistant WCR. Goal is to have mandatory stewardship program (includes crop rotations, multiple MOAs, non-Bt + SAI.)
 - But: No real pyramids
 - EPA: still benefit from pyramid.
 - Goal: Adoption would have two-tiered approach reflecting intensity of Bt use. Corn states: 50% of acres use rotation, Fringe areas: 33% rotation.
- Detecting unexpected damage (UXD): field failures are the indicators, random sampling is a failure. Use 0.5 NIS threshold on pyramids, 1.0 NIS threshold for single PIPs. Collect adults in same field, use on-plant bioassays, immediately implement BMPs.
 - If UXD is found, increase mitigation participation (BMPs) to greater than 75% of nearby acres.
- It is a challenge to define the remediation zone. Need more information about geography of remediation and empirical dispersal data.
 - Hotspot scenario vs. multiple farms and a regional occurrence.
- Standard Language is needed: BMPs, UXD, IPM and it must be communicated in multiple ways (bag tag, user guides...)
 - Are growers facing a 3-years and out scenario?
 - How do low dose products for certain Lepids fit in (e.g. *H. zea*)?
 - Criticism: Land Grant Universities have been advocating IPM for decades, yet resistance keeps coming. Growers have information, but they act in their SHORT TERM best interest.
 - Criticism: The rules have no teeth and resistance is out there. We need to focus on Lepidopteran pests. CRW remediation may have little value. Presently should focus on Lepidopteran pests refuges; Attend to CRW suppression of current hot spots. Future offerings are chance to initiate truly sound IPM+IRM.

ABSTC position and update on current IRM situation and report on refuge compliance - Jeffrey Bookout, Chair ABSTC.

- Majority of growers use refuge, cotton areas are an exception.
- RIB adoption is growing (5% in 2013 to 47% in 2014)
- Refuge compliance is 73% of all regions. Only 1% planted no refuge intentionally in E. Corn Belt (21% in cotton areas).
- Just 6% of corn acres have no CRW refuge.
- “Rotate your corn” and “Respect the Refuge” advertisement messages are in media.

Response to EPA Proposal - Tony Burd, ABSTC Technical Communications Chair.

- Industry promotes IPM approach and has done so for a long time.
- We can manage resistance, but we have to be flexible enough to make participation possible for growers.
- IN favor of immediate implementation of BMP with UXD—regardless of whether resistance is documented at the time—the BMPs must work!
- Removal of random sampling is great.
- Re: replacement of diet bioassays: ABSTC prefers criteria of IRAC assay publication:

- Plant assay is not good for high-throughput nor is it cost effective
 - Will continue to explore standard diet bioassays
- Re: Enhanced remedial action: A measurable response to UXD is needed. Remedial action can be useful—especially for low dose traits.

CLOSED SESSIONS

Monsanto report on CRW BMPs and monitoring - Matt Carroll and Sean Evans, Monsanto

Committee Discussions (IRM, Neonicotinoids, etc.)

- We need to think about ECB IRM. CRW needs will lead to more non-Bt corn and open the door to ECB. How long before populations build up?
- ECB is not gone; some areas in NE was found in 50% of non-Bt cornstalks. No ECB were noted in the prior year. ECB is out there.
- What is proactive Lep Bt-management; what are BMPs for Lep pests (beyond rotating MOAs?).
- For some areas it seems that “BMP “ is just the latest, greatest product—it is far from proactive. Field specific management means nothing for lepidopteran pests.
- Pollinator Management Plans will be part of NNi use guidelines.
- Also consider herbicide resistance management as part of IRM. Are there non-regulatory approaches to improving IRM.
- Should a response to the EPA Docket be for Corn Belt and include Fringe areas?
- Does rotation-resistant WCR problem necessitate a separate comment to the Docket?
- A general cover letter might emphasize that “It’s not that simple”—there is variation across the US and a regional response may be warranted.

Joint session adjourned at 12:00 noon 28 January 2015.