

**VERMONT AGENCY OF AGRICULTURE, FOOD AND MARKETS (AAFM)
AGRICULTURAL INNOVATION BOARD (AIB)**

MEETING MINUTES

DATE: April 24, 2023

LOCATION: Vermont Agency of Agriculture, Food and Markets 94 Harvest Lane, Williston, VT 05495 –
Conference Room 210 / Virtual Microsoft Teams Meeting

Member	Present	Absent
St. Pierre, Amanda	x	
Beckford, Roy	x	
Bradshaw, Terry		x
Chamberlin, Jonathan	x	
Cutler, Clarice	x	
Ransom, Earl		x
Rebozo, Ryan	x	
Schubart, Steven		x
Owen, Sarah	x	
Harper, Wendy Sue	x	
DiPietro, Laura	x	
Dwinell, Steve	x	
Morgan Griffith	x	
Guests in Attendance		
Stephanie Smith		
Jill Goss		
Dave Huber		
Andrew Munkres (VT Beekeepers Association)		
Clark Parmelee		
Zach Szczukowski		
Lisa Fantelli		
Fred Putnam Jr (VT Beekeepers Association)		

Meeting called to order: 1:00 PM EST

Meeting adjourned: 3:39 PM EST

Next meeting: Monday May 22, 2023

Agenda:

1:00 PM – Welcome & Introductions

1:05 PM – Agenda, previous meeting minutes & action item review

1:10 PM – PHARM activities update

Seed Report Update

Agricultural Input Survey Re-distribution Plan

1:40 PM – Andrew Munkres, VT Beekeepers Association
Impact of Neonicotinoid Treated Seed on Pollinator Health

2:40 PM – Morgan Griffith, AAFM
Summary EPA Neonicotinoid Ecological Risk Assessment

3:15 PM – Workplan status, next meeting agenda

3:35 PM – Review of relevant 2023 Legislative Bills

3:45 PM – Public Comments

4:00 PM – Adjourn

New Action Items

Action	Responsible Party	Complete? (date)
Compare crop acreage numbers to seed tonnage reports	AAFM	
Secretary Tebbetts send email to Ag organizations that provide education and technical assistance to increase participation in Ag Input Survey	AAFM	
Look into possibility of AIB hearing presentation about economic impact of loss of pollinators to food crops. Wendy Sue will reach out to her colleague to ask if they were interested in presenting to AIB	Wendy Sue Harper	

Ongoing Action Items

Action	Responsible Party	Complete? (date)
AIB members let Morgan know if eligible for per diem reimbursement to receive necessary paperwork	All eligible AIB members	
AAFM will provide information and research on planter modifications to reduce dust from treated seeds.	AAFM	

Welcome & Introductions, agenda, previous meeting minutes & action item review

- 3/27/2023 meeting minutes accepted with one minor change made by Sarah Owen.
 - 3/27/2023 minutes have been updated and uploaded to the AIB website and Teams site.
- No additions/modifications to agenda

PHARM activities update

- Stephanie Smith (Deputy Director of Public Health and Agricultural Resource Management Division, AAFM)

- Seed Report update – Jill Goss
 - Summary of reported seed by type in 2022, treated seed categories top three were soybean, corn, and legume/forage/pasture
 - Corn and legume nearly universally treated, soybean has largest portion untreated
 - Primarily seeds are sold to dealer instead of directly to farmer
 - 72% treated seed by ton, 28% untreated seed by ton
 - Treated seed is primarily (98%) combination of products applied
 - Top 3 treatments: insecticide, fungicide, nematicide
 - 75% of treatments were neonic treated 9% were non-neonic
 - There are fair number of people that AAFM did not receive tonnage reports from (1,000 tons that we don't know if treated or type of seed). And there may be some redundancy in the reporting.
 - Comprehensive seed report will be posted on AAFM website
 - [2022 Treated Untreated GE Seed Reporting.pdf \(vermont.gov\)](#)
 - Can we look at acres planted and also seed sold?
 - Roy Beckford, indicates there are acreage numbers available
 - ** compare acreage numbers to seed numbers
- Agriculture input survey re-distribution plan
 - Proposal of plan to try and get greater participation in the survey:
 - Ask Secretary Tebbetts to personally email technical service providers and agricultural organizations to ask if they can help the AIB by participating and distributing the survey. Once providers/organizations have confirmed they will help the agency, then we can redistribute the survey
 - **Board is in agreement with this redistribution plan for the survey
- Dave Huber (Deputy Director of Public Health and Agricultural Resource Management Division, AAFM)
 - Not available for update

Andrew Munkres, VT Beekeepers Association: Impact of Neonicotinoid Treated Seed on Pollinator Health

- Commercial beekeeper, and President of VT Beekeepers Association (VBA), spoke to AIB last July
- Impact of neonic treated seed on honeybee colonies, but will also touch on exposure
- Honeybees eat nectar and pollen and store within hive to feed themselves and the surplus that is harvested is for commercial honey crop
- Pollen is not stockpiled overwinter and is used to feed developing larvae
 - Pollen is stored close to the larvae within the hive so is a potential exposure route
- Addressing nitroguanidine neonics
 - Clothianidin, imidacloprid, thiamethoxam
 - All highly toxic to pollinators
- 86,000 acres corn and considerable less than that in soybeans in Vermont
 - More soybeans grown recently
- Why can't beekeepers move away from crop fields or have sanctuary range within Vermont?
 - Flight range is up to 3-5 miles from the hive looking for food. Provided a map of this range around all registered honeybee apiaries

- Honeybee production areas overlap with agricultural land
 - Forested areas are not conducive to honeybee colonies because there is not enough food for them.
- Soybeans produce nectar and pollen, corn produces pollen in late summer (even though it is not quality)
- Don't see the bee kills that were seen with organophosphates, but increase in toxic loading in cropland due to neonics because of persistence, exposure, modes of dissipation.
- Seeing increased honeybee losses since 2008
- Exposures due to dust from planting, systemic pesticides in pollen and nectar, guttation water, and in surface water
 - Also there are ground nesting native pollinators
- Dust from planting treated seed
 - Acutely toxic (i.e. fly over field while actively planting) and chronic toxicity
 - Dust landing on non-crop plant up to 9ppb, which would be acutely toxic, but lower levels could result in chronic exposure
 - Levels of neonics found in field adjacent crops – showed data to support this statement
- Guttation fluid
 - Water that plant has pulled up and expressed through plant pores. Occurs in corn until it is 2-3 feet tall.
 - Study found 10,000 – 47,000 ppb neonics in guttation fluid (highest levels of neonics found in this fluid)
 - Bees foraging exposed to neonics at these levels in guttation fluid will most likely never return to the hive, but if they do they will bring the contaminated fluid back to the hive
- Nectar in general contains lower levels of neonics than guttation fluid
- Dust is hard to measure, but can be quantified through tissue samples of adjacent plants once dust has settled and absorbed
- Neonics from agricultural watersheds averaged 0.012 ppb (Barrons, 2021) this level is above LOEC for the 3 neonics
- Pollen
 - VBA Partnered with UVM graduate thesis project and sampled four apiaries throughout VT: nectar, pollen and flower samples.
 - 16 pollen samples analyzed at Cornell lab
 - Neonics were detected in may, a little in June, and a little in August.
 - This corresponds to planting and tasseled corn stage
 - This timing corresponds to colony population build up around May/June and then winter bees being raised in Aug.
 - In 2022 more samples were collected, results were received on Friday.
 - Low levels still above LOEC likely cause behavioral problems
 - 24% of pollen samples contained neonics above LOEC
 - 14% plant tissue samples contained neonics above LOEC
 - This is parallel to what is seen in other parts of the country
 - AAFM also sampled in 2022 and no detections were found. May be differences in lab reporting limits (California lab vs Cornell labs)
- Pollinators are extremely sensitive to neonics and neonics are extremely toxic to honeybees

- Dosage studies summarized showing change in bee behavior and life expectancy when bees dosed with specific neonicotinoid.
- Charreton et al, 2015 study summarized sublethal dose exposure effects on bee behavior
- Yang et al, 2012 study showing impaired olfactory memory in adulthood caused by larval contamination of imidacloprid
- Insecticides are not working on their own, neonic toxicity can be increased by other products tank mixed or in seed coatings.
- Synergistic effects of innate pathogens and pests (nosema and varroa mites) of honeybee with neonic exposures
 - Increased mortality when honeybees infected with Nosema exposed to neonic
- Queen and colony strength
 - Queen is only fertile female within the colony so impact to queen is significant to colony as a whole
 - Significant reduced egg laying in queens exposed to neonics (10-100 ppb) over 3 weeks
 - 0.6 ppb imidacloprid 0.3 ppm thiamethoxam dosage resulted in reduced nutritional content in royal jelly being fed to the queen. Generally, results in reduced queen productivity
 - Smaller colonies are less likely to survive winter because cannot generate enough warmth
- VBA recommendations
 - Diamides (i.e. cyantraniliprole) are significantly less toxic than nitroguanidine neonics and available as seed treatment
 - Eliminate prophylactic use of systemic pesticide treated seed
 - Only plant treated seed when IPM testing reveals a pest problem
 - Choose the least toxic pesticide for the application
 - Phase out nitroguanidine neonics completely within 2-3 years
- Questions
 - Plant tissue samples were taken from plants adjacent to agricultural fields – sampled actively blooming plants (dandelions, alfalfa, golden rod)

Morgan Griffith, Agrichemical Program Manager, Agency of Agriculture, Food and Markets: Summary EPA Neonicotinoid Ecological Risk Assessment

- Provided summary of EPA Proposed Interim Registration Review Decisions (PID) published in January 2020 of imidacloprid, thiamethoxam and clothianidin. Also the final bee risk assessments for these chemicals.
- Largest agricultural use of imidacloprid, clothianidin and thiamethoxam in terms of pounds active ingredient applied has been in the form of seed treatments
 - 3% of acres receiving thiamethoxam did so through soil or foliar applications, remaining 97% received thiamethoxam through seed treatments
 - Similar for clothianidin
- Focused on ecological risk assessment relevant to treated seeds.
- Highest acute and chronic risks identified for terrestrial organisms were from ingestion of residues on treated seeds.
 - The size of the seed and the size of the bird or mammal dictates the size of the risk.
- All 3 chemicals are classified as highly toxic to honeybees.

- EPA does not have a method to reliably quantify exposures of bees via dust from treated seeds and therefore their risk assessment focuses on quantitative estimates of exposure via contact and ingestion of pollen and/or nectar.
- EPA's risk assessment of imidacloprid on bees does consider the potential exposure route of year to year accumulation of imidacloprid in soils that lead to higher residues in pollen and nectar. While model results and some empirical data from multi-year applications in soil suggest possible year-to-year accumulation in soils, available residue data in pollen and nectar are not indicative of imidacloprid carryover in treated crops. Furthermore, imidacloprid residues in succeeding crops (e.g. white clover following seed treatment applications to corn) are low when detected, such that risk to honey bees is not expected.
- Terrestrial invertebrates risk assessment
 - Full field colony level studies on effects of imidacloprid seed treatment uses generally did not indicate treatment related effect. And imidacloprid seed treatment was associated with relatively low residue levels in pollen and nectar in field residue studies
 - Residues from clothianidin/thiamethoxam seed treatment were all below NOAEC for honeybee colony effects, so low risk on colony level.
 - Multiple bee kill incidents were reported in association with planting of treated corn seed possible link to dust drift.
- Clothianidin field studies evaluating effects of seed treatments to honeybees/bumble bees/mason bees/wild bees
 - Honeybee colonies placed in or adjacent to fields planted with either treated corn or treated canola seeds. No significant difference between treated and control sites for colony development or health
 - Colonies located in treated corn fields had a transient increase in amount of brood compared to control
 - Seed treated oilseed rape study found no significant differences in number of adult honeybees between control and treated fields
 - Bumble bee colonies placed adjacent to oilseed rape seed fields treated with clothianidin had significant decrease in mean number of queen and worker/male cocoons per colony and a decreasing rate of growth
 - Study on impact on wild bees and mason bees adjacent to oilseed rape fields with clothianidin treated seed found wild solitary bees per flower was reduced in treated field and field borders. Mason bee colonies placed adjacent to the treated seed field had reduced median number of brood tubes (6/8 females in control and 0/8 females in treated group started to build brood cells)
- Thiamethoxam field studies evaluating effects of seed treatments to honeybees/bumble bees
 - 5 studies evaluated exposure after treatment of sunflower seed reported transient effects on honeybee mortality, no treatment related effects on brood number or adult bee foraging activity
 - Study with thiamethoxam treated oilseed rape seeds observed increased honeybee mortality
 - Another oilseed rape treated seed study showed no clear treatment related trends for measured endpoints (lifespan, foraging, homing activity)
 - Study examining sowing operations of thiamethoxam treated corn seeds observed similar mortality in the control hives and the treatment hives the day of planting, but transient increases in honeybee mortality immediately after sowing in the treatment

- group. Except for the day of sowing the control hives had higher mortality on all other days compared to treatment hives
- Bumble bee colonies placed adjacent to clothianidin and/or thiamethoxam treated conventional corn fields or adjacent to reported organic corn fields. Number of workers was significantly reduced (down 25%) in the neonic treated fields compared to organic. Worker and drone weights were reduced >25% in colonies adjacent to treated fields (but not significant $p>0.05$)
 - Bumble bees exposed to flowering rape grown from thiamethoxam treated seed and no significant effects were observed in the treatment group compared to control
 - Study evaluated development of bumble bee colonies that foraged on flowering oilseed rape (from thiamethoxam treated seed) for 5 weeks: increase in colony mass and foraging activity, higher number queens, workers, eggs, larvae. But lower number of drones compared to control
- No significant risks of concern were identified for aquatic invertebrates, fish, aquatic phase amphibians, or terrestrial and aquatic plants.
 - Some incidents have been reported to EPA that could possibly be linked to treated seed applications affecting bees.
 - EPA's proposed mitigation measures that resulted from their ecological risk assessment and identified risk to birds and small mammals ingesting treated seed are proposed additional seed bag label language:
 - "Cover or collect treated seeds spilled during loading and planting in areas (such as in row ends)."
 - "Dispose of all excess treated seed by burying seed away from bodies of water."
 - "Do not contaminate bodies of water when disposing of planting equipment wash water."
 - EPA stated "These risk mitigation measures were considered with the understanding of the high benefits associated with seed treatment uses, which through their use, have the potential to reduce overall neonicotinoid exposure and offer a lower overall ecological risk compared to foliar uses."
 - Clarice pointed out that there is a difference between VBA and EPA recommendations. The EPA includes and considers the benefits of neonic treated seeds in their risk assessment in addition to the toxicity of the neonics.
 - This is the balance that AIB has to consider when determining their recommendation for neonic treated seed BMPs.

Workplan status, next meeting agenda

- Sarah Owen plans to complete her review of human health risk assessment by fall with a formal write up.
- Members would like to hear perspectives/research from entomologists in regions like Pennsylvania and New York, as well as farmers and researchers in Ontario to address the topics outlined in the workplan.
 - Jonathan Chamberlin is very interested in hearing more from Ontario about data resulting from treated seed regulations.
 - Wendy Sue Harper suggested hearing about the economic impact of loss of pollinators to food crops

- **She will reach out to her colleague to ask if they were interested in presenting to AIB
 - Fred Putnam suggested contacting Scott McArt from Cornell about this topic
- **AAFM will work on building an agenda for May 22 meeting and if presentations cannot be lined up we will cancel meeting.

Review of relevant 2023 Legislative Bills

- None that we are aware of

Public Comments

- None

** - indicates action item