

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

**MEETING MINUTES**

DATE: March 25, 2024

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

<b>Member</b>	<b>Present</b>	<b>Absent</b>
St. Pierre, Amanda	x	
Beckford, Roy		x
Hazelrigg, Ann	x	
Chamberlin, Jonathan	x	
Pajak, Abbi		x
Ransom, Earl		x
Rebozo, Ryan	x	
Schubart, Steven		x
Owen, Sarah	x	
Harper, Wendy Sue	x	
DiPietro, Laura		x
Dwinell, Steve	x	
Griffith, Morgan	x	
<b>Guests in Attendance</b>		
Stephanie Smith Pam Bryer Jill Goss Dillon Gabbert (Bayer) Zach Szczukowski Brooke Decker Clark Parmelee Bruce Young (Bayer) Lisa Fantelli Eric Roy (UVM) Kate Porterfield (UVM)		

**Meeting called to order:** 1:00 PM EST

**Meeting adjourned:** 4:06 PM EST

**Next meeting:** Monday May 20, 2024, 1-4PM

**Agenda:**

**1:00 PM** – Welcome & introductions

**1:05 PM** – Agenda, previous meeting minutes, AAFM/Legislative update

**1:35 PM** – Best Management Practices for the Use of Insecticide Treated Article Seeds – Steve Dwinell, Agency of Agriculture, Food and Markets

**2:00 PM** – Agricultural inputs survey update

**2:30 PM** – Next topic discussion

**3:15 PM** – Microplastics research in VT – Dr. Eric Roy, University of Vermont

**3:55 PM** – Public Comments

**4:00 PM** – Adjourn

**New Action Items**

<b>Action</b>	<b>Responsible Party</b>	<b>Complete? (date)</b>
Provide Morgan with additional suggestions for next topics for AIB to address	AIB Members	
Contact Margaret Skinner (UVM) with proposed survey questions to be included in her upcoming survey	Morgan Griffith	2/27/2024
Contact Sarah Kingsley-Richards (UVM) about capabilities of polling participants in her upcoming pesticide certification trainings	Morgan Griffith	3/19/2024
Send Sylvia Knight link to H.706 bill comparison meeting material	Morgan Griffith	2/27/2024
Follow up with Margaret Skinner (UVM) about timing of her survey with AIB questions included	Morgan Griffith	
Coordinate with Ryan Rebozo and Steve Dwinell about researchers to schedule and topics for future meetings concerning pollinator habitat and pollinator protection focus topics	Morgan Griffith	

**Ongoing Action Items**

<b>Action</b>	<b>Responsible Party</b>	<b>Complete? (date)</b>
AIB members let Morgan know if eligible for per diem reimbursement to receive necessary paperwork	All eligible AIB members	

**Welcome & Introductions, agenda, previous meeting minutes & AAFM/Legislative update**

- February 24, 2024 meeting minutes accepted without edits
- Heard about 3 legislative bills last meeting
  - Rodenticide bill was modified and reduced to requiring all second generation anticoagulant rodenticides (SGARs) to be classified as state restricted use products (RUP). This will apply to 12 products. They will be registered as state RUPs by the Agency
    - A preliminary survey of market places by Agency Field Agents resulted in observations of only 6 of the 12 products

- PFAS bill ([S.197](#)) was modified and passed by the Senate. The Bill now requires the Agency of Natural Resources (in consultation with Agency of Agriculture, Food and Markets (AAFM), the Department of Health, and the office of the Attorney General) to propose a program requiring the State to identify and restrict sale of consumer products with PFAS. The program has to:
  - Identify categories of consumer products that could impact public health or environment contamination
  - Propose process for manufacturers to determine if products have PFAS
  - Address how information about presence or absence of PFAS in product is communicated to the public
  - Describe which agency/dept is responsible for the program
  - Learn from other states and identify best practices used in their efforts
  - Propose clear definitions for “intentionally added”, “consumer product” and “PFAS”
  - Propose public service announcement program and website to inform people of potential public health impacts of exposure to PFAS and how you can reduce that risk
  - The implementation plan has to be submitted by November 1, 2024
- [H.706](#) there is a version that passed House last week to move to Senate
  - Restricts sale or use of neonic treated seeds as of Jan 1 2029
  - Restricts sale or use of neonics for certain non-seed treatment applications
  - The BMP requirement was modified for BMPs for use of all neonicotinoid pesticides and treated articles
    - If the bill passes, the AIB will be tasked with making recommendations for these expanded BMPs

**Best Management Practices for the Use of Insecticide Treated Article Seeds – Steve Dwinell, Agency of Agriculture, Food and Markets**

- As required by legislation the Secretary of AAFM submitted BMPs for use of insecticide treated seeds on March 1.
- BMPs were based on recommendations from AIB and allowed for further research and education to still happen
- Purpose of BMPs was stated as recommended best practices whenever reasonable or practical and can be added to or modified as Vermont-based research evolves and provides more guidance.
- Steve Dwinell will be testifying on Thursday morning to the House Ag Committee about these BMPs
- This is intended to be rulemaking which is a long process with a lot of opportunity for public and legislative input.
- These BMPs will have to be revised and expanded if the proposed bill passes as currently written to include all neonicotinoid uses, not just treated seeds.
- Language is “should” as opposed to “shall” to indicate best practice
- Wrote these for all insecticide treated seeds, not just neonicotinoid treated seeds, and we see in Canada and soon in NY that insecticide treatments may transition to diamides or others. So the intention was for these BMPs to cover whatever alternatives become available.

- BMPs were pulled from large list of BMPs from other states and organizations (i.e. MN, ASTA, CRDC, CT, etc) that were reviewed and discussed by the AIB
- Specifically did not include scouting BMP because the decision to purchase treated seeds comes well before scouting can practically occur.
  - But does include BMP to use multiple pest management methods like crop rotation and tillage practices that can help reduce pest pressures

### **Agricultural inputs survey update**

- Survey questions were asked during the Agricultural Pesticide Applicator training held by the UVM Pesticide Safety and Education Program on Tuesday March 19.
- Received 55 responses from all counties except: Caledonia, Essex, Washington, and Windham
- Top 2 concerns when using agricultural inputs are non-target pollinator exposure and disposal of farm materials that are no longer useful
  - Other concerns in descending order: non-target beneficial exposure, microplastics, PFAS, non-target rodenticide exposure
- Top 2 challenges in reducing agricultural inputs are effectiveness of alternatives and availability of alternatives
  - Other challenges in descending order: cost, knowledge of alternatives, convenience of alternatives
- Survey is showing that farmers have concerns, but are wondering what realistic alternatives going to be.
- There was question whether “effectiveness of alternatives” was interpreted as if the alternative was effective compared to the original choice or if the alternative is effective at reducing the concern about the original choice.
- \*\* Morgan will follow up with Margaret Skinner about timing of her survey, which will include AIB’s questions.

### **Next topic discussion**

- Wendy Sue has heard lots of reports about finding microplastics pretty much everywhere. Would love to hear from more experts so that that we have a deeper understanding of it.
  - One paper she read was researching cadmium uptake by plants
- Amanda is interested in microplastics and in how other industries are handling this issue. Is Vermont ready for us to switch our recycling and other disposal habits?
  - Would like to know more about Vermont’s infrastructure to handle our switch over
  - How did other industries change and transition? Have they yet?
- Expand beyond neonic treated article seeds when looking at non-target pollinator exposures
  - AIB can get information that is available to identify specific groups of pollinators that we should focus on.
    - For example, blueberries may be primarily pollinated by bumble bees, we could use this as a case study since blueberries are growing industry in Vermont
  - One recommendation from AIB is to expand pollinator habitat. AAFM has a goal to become more involved in this. AAFM has scheduled meeting with Agency of Transportation about pollinator habitat opportunities
    - Ryan agrees pollinator habitat should be focus area
  - Non-managed pollinators should be an important topic for further information

- \*\*reach out to Ryan and Steve Dwinell about researchers to schedule and topics for future meetings concerning pollinator habitat and pollinator protection focus topics
- Disposal of farm materials topic of concern from survey
  - 2 different bills were introduced this year relevant to tire disposal, but did not make it out of committee. They were about potentially extending producer responsibility programs to reduce tire waste.
- PFAS report will be joint effort with AAFM, DEC and DOH
  - If passed through legislature, AIB will schedule an update on the status of the program development later in the year
    - have DEC come in to be part of the discussion with Sarah Own and Pam Bryer

### **Microplastics research in VT – Dr. Eric Roy, University of Vermont**

- Microplastics (MP) in composts, digestates and food wastes
- Started looking into this 3 years ago with comprehensive literature review
  - Covered microplastics in composts, digestates, food waste and agricultural soils
  - Makes recommendations for better linking science and policy
  - Science is further along for MP contamination in water
- Quantified MP in depackaged food waste, digestate and compost
  - Measured bio-gas potential and MP content in mechanically depackaged food waste
  - State-wide survey of 20 composts (commercial facilities)
  - EPA funded project more research on biogas potential and MP characterization for food and beverage waste
- Linking life cycle assessment of food waste management with microplastics mass balance (publication in progress)
- Lit Review
  - 16 studies (in the world) provided original data on MP in organic residuals (food wastes not biosolids)
  - Counts or particles per dry kilogram of materials. Ranges were all overlapping and were rather large (large variability). Did not see one type of residual with more MP contamination than another
  - When reported as percent mass it takes into account small and large pieces
  - Key takeaway: MP contamination is a systemic challenge not limited to any one food waste processing strategy
    - Variability in estimates can be driven by feedstocks, how packages are separated or other processing methods used. Also methods used to quantify the MP (i.e. the size fractions that were included in results)
    - There are no standard methods for isolating, identifying and characterizing MP in complex organic matrices
    - Units matter – abundance/counts vs mass
    - Policies focus on weight-based limits – this is probably the right way to go but many studies are incongruent because only report counts of MP.
    - There is some evidence that MP may adversely affect soils and plants, however lack of common units between MP ecotoxicity and abundance studies precludes rigorous assessment
      - How much is too much?

- Measuring MP is a prerequisite for monitoring and regulation
  - There is no standard method for measuring in complex organic matrices
  - FTIR used as confirmation that fragments are plastic, but complicated because some food packaging is layers of different polymers
- Project measuring MP contamination from mechanical depackager in Williston
  - Looked at 2 waste streams: pre-consumer ice cream pints and post-consumer source separated food waste
  - Used hydrogen peroxide digestion and sieving (1mm and 0.5mm) so lowest detection limit was 0.5mm sized MP. Visual inspection, where suspect particles were separated and issued through dichotomous key to determine if particle is MP. Then used ATR-FTIR to confirm characterization of plastic particles. Weighed particles to estimate percent weight
  - Both pre-consumer and post-consumer had similar biochemical methane potential
  - Plastic content
    - Depackaged pre-consumer ice cream pints had higher % w/w but similar particle counts as digestate samples
  - Low contamination rates on a % w/w basis and was consistent with limited literature reports. Also highlights that units matter, where high particles counts did not translate to higher % w/w
  - Majority of particles were relatively small films, but majority of mass was coming from fragments. So when fragments present they accounted for the majority of the % w/w mass
  - Think that a lot of these fragments are multiple layers of plastic polymers in food packaging, but also saw some cross contamination from different feedstocks when analyzing the depackaged food waste.
- Compost study research questions
  - Are VT composts contaminated with MP?
  - Are MP count and mass correlated?
  - What type of polymers are most common?
  - Compost was more problematic in that it has even more plastic “look alike” materials so data is separated by confidence levels
  - There was debate about potential policy on this issue that set tolerance at 0.5% w/w film plastics
    - All these composts surveyed would fall below this standard tolerance level
  - Tend to see higher MP numbers (count and % by weight) when more food waste was used as feedstock for compost than when low to no food waste as feedstock.
    - 0.017% w/w in high food waste was similar to MP % seen in digestate
    - Low/no food waste composts were taking things like horse manure and grass cuttings and agricultural residues etc as food stocks.
- Key takeaways
  - MP contamination is systemic challenge in organic recycling and is not necessarily linked to any single organics management strategy
  - Not well understood the extent to which organics recycling is an important flow to the environment relative to other sources (i.e. black plastic mulch)

- Food packaging is likely dominant source of microplastics (and PFAS) in food waste streams and derived composts or digestates
- Life Cycle Assessment – modeling approaches that try and measure impact of process from cradle to grave (i.e. measuring carbon footprints of products)
  - Question 1: what environmental benefits and burdens are associated with different food waste management strategies (landfilling, composting, anaerobic digestion)?
  - Question 2: what is the flow of MP to agricultural soils under different management scenarios?
  - Question 3: do food waste stream characteristics (i.e. TS, contamination rate etc) influence optimal strategy?
  - Trying to calculate environmental impact of 1 ton of mixed post-consumer food waste managed by 3 different scenarios but including all contaminants therein the food waste
    - Scenarios: landfilling, anaerobic digestion, composting
  - Impact categories
    - Global warming potential (CO<sub>2</sub> equivalents)
    - Eutrophication potential (marine (N equivalents) and freshwater (P equivalents))
    - Plastic pollution (Kg plastic) – take into account what % of plastic is biodegradable and what is not
  - Modelling approach
    - Characterize the inputs in the food waste stream (i.e. total solids, plastic contamination, total N, total P, etc)
    - Inputs go into mechanical depackaging – some rejected and go to landfill – then go to anaerobic digestion – energy to electricity – then digestate onto land – N and P fertilizer and emissions
    - There is a complex model that will account for all impacts and offsets, what is shown in slide is very simplified example of digestion scenario only
    - This modelling approach is novel because it includes MP as an impact and predicts plastic flow to agricultural soils
      - Allows for input of ranges and the output from the model will show a distribution of data
- Amanda: We have an anaerobic digester and currently converting to produce gas instead of electricity. Their biggest hurdle is answering whether they are taking anything other than manure. This is very interesting and there is a strong push about taking substrates other than manure. What have you been hearing? This is interesting based on what we are being pushed to take. In our world today, I'm not sure how popular this would be.
  - Eric Roy: we interviewed several farmers with anaerobic digestors and we can say there is a trade-off that accepting these feedstocks between boosting energy production and potential contamination (even if low MP contamination risk)
  - We will be sharing more data within the next year
  - Focus on upstream reducing contamination risk
- Steve Dwinell: have you evaluated methods for reducing MP production in mechanical depackagers?
  - No, but there is potential there for future research. There are opportunities to optimize depackager settings and processes. We only looked at one depackager. Their

specifications for the equipment say 99% removal of packages. Our data shows they are above 99% removal so it is impressive, but can always have room for improvement

- Are there any standards?
  - A depackaging working group was formed and run by DEC that recently put out a report
  - [Depackager Stakeholder Group](#)
    - [STAKEHOLDER GROUP ON THE ROLE OF DEPACKAGERS IN MANAGING FOOD WASTE - REPORT OF RECOMMENDATIONS](#)
- Steve Dwinell: Have you ever looked at MP in biosolids?
  - We have not, but there are a lot of studies and they show that they are present. Compared to depackaged samples there are a lot of fibers (due to washing fabrics)
- Steve Dwinell: are there ecotoxic studies?
  - Studies on earthworms, and microbes function in soil. Overall it seems like it depends – in general there is potential for ecotoxic effects, but still work to be done to establish levels that could potentially cause these effects.
  - Might make sense to take into account accumulative applications of MP, similar to biosolids regulations relevant to heavy metals.
  - Important to think about cumulative loading because MP are not prone to breaking down.
- Solutions to this problem is looking upstream into packaging design
- Sarah Owen presented at depackager stakeholder group in November 2022. There is some information that suggests they are sometimes toxic to humans through inhalation and ingestion.
  - Paper in Journal of American Medical Association recently showed that people with plaques in arteries that contained MP were more likely to have an adverse cardiac event
- Key question for regulatory agencies is where are we looking for it since it is so ubiquitous. So thoughtfully narrowing down the key routes of exposure.
- Sarah Owen asks that if AIB take up MP that we carefully consider scope and identify some sort of tangible goal. We need to come out of it with something usable, not just reaffirming what we all know.
  - Is good information to be aware of, potentially there may be role of AIB relevant to some materials used in agriculture so keep in touch with Eric Roy.
  - AIB will have them back when finished with upcoming research paper – sometime in Fall 2024.

### **Public Comments**

- None

\*\* - indicates action items