ANNUAL REPORT OF THE AGRICULTURAL INNOVATION BOARD

2021 Act No. 49, codified at 6 V.S.A. § 4964(c)(1)

Submitted to the:

General Assembly

By the:

Agricultural Innovation Board and the Vermont Agency of Agriculture, Food & Markets

January 15, 2026

6 V.S.A. § 4964(c)(1) Powers and duties of the Board.

"The Agricultural Innovation Board shall:

(1) issue a report annually to the General Assembly on or before January 15 that recommends policy solutions to assist farmers in:

(A) reducing the use of and exposure to pesticides; and

(B) the use of innovative or alternative practices[.]" (Emphasis added.)

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Introduction

On June 1, 2021, Governor Scott signed Act 49 into law and the Agricultural Innovation Board (the Board or AIB) was created. The Board is tasked with thirteen separate charges (Table 1). The establishment of the Board and its responsibilities are codified at 6 V.S.A. §§ 1105a and 4964(a)-(d).

Pursuant to the enabling legislation, the Board shall provide an annual report to the General Assembly that recommends policy solutions to help farmers reduce the use and potential non-target exposure to pesticides, learn about options for agricultural plastic disposal and alternatives, and encourage the utilization of innovative or alternative practices to reduce the potential environmental impact from agricultural inputs of concern. For the majority of 2025, the AIB addressed the following legislative charges based on survey results indicating that the environmental impact of disposal of agricultural waste (tires, agricultural plastic, plastic pots, old pesticides, etc.) was of greatest concern amongst the participants:

6 V.S.A. § 4964

> *(5) Recommend practices to reduce the use and generation of waste associated with plastic in farming.*
>
> *(12) Study and issue recommendations regarding the feasibility of the use of biodegradable plastics in agriculture and the promotion of the use of and production of biodegradable plastics and similar products in Vermont.*

This document is the Board's annual report containing a description of the Board's learnings and recommendations and an outline of the planned work for the coming year.

Board Meetings

Pursuant to 6 V.S.A. § 4964(b)(4), the Board is required to meet at least four times a year. Board Meetings in calendar year 2025 were held on January 27, March 24, May 19, July 28, September 22, and December 8. Minutes, recordings and materials presented from these meetings are maintained by the Agency of Agriculture, Food & Markets (the Agency) and are available on the AIB Website under "Meeting Information" at this link:
Previous Agricultural Innovation Board Meetings | Agency of Agriculture Food and Markets
[https://agriculture.vermont.gov/previousAIBmeetings]

Agricultural Input Survey

6 V.S.A. § 4964(c)(3) states that the AIB shall "survey farmers from every county in the State to help better understand how agricultural inputs, such as pesticides, synthetic fertilizers, and plastics, are currently used as well as current challenges farmers face in reducing these inputs in order to better inform recommendations to be provided in the annual report required under subdivision (1) of this subsection." Survey questions about agricultural inputs were included as poll questions during the virtual Agricultural Pesticide Applicators Meeting in March 2024. The Board received 55 responses, representing 10 counties. A summary of the responses can be found on the AIB website: Agricultural

Innovation Board (AIB) 2024 Agricultural Inputs Survey Results (Round 1). Overall, when asked what environmental impacts are of concern when using agricultural inputs, respondents identified the following concerns (listed in order of most selected to least selected by participants); non-target pollinator exposure, disposal of farm materials that are no longer useful (tires, ag plastic, pesticides, etc.), non-target beneficials exposure, microplastics, PFAS (per- and polyfluoroalkyl substances), and non-target rodenticide exposure. The challenges to reducing use of agricultural inputs that cause environmental concern identified by most respondents are effectiveness and availability of alternatives, followed by cost and knowledge of alternatives.

These survey questions were also included in a larger survey disseminated by the UVM Entomology Research Laboratory to regional high tunnel growers in the Northeast from November 2024 through April 2025. A total of 43 farmers completed the survey representing the following states in the Northeast region: Maine (7/43, 16%); Massachusetts (3/43, 7%); New Hampshire (22/43, 51%); New York (2/43, 5%); Vermont (9/43, 21%). The Vermont participants represented seven counties. The responses from the Vermont participants followed the same trends as those from the other states in the Northeast. In response to the question about what environmental impacts are of concern when using agricultural inputs, all nine of nine respondents selected disposal of farm materials including tires, agricultural plastic, plastic pots and old pesticides as a concern. The environmental impacts of concern when using agricultural inputs selected in order of most selected to least selected by participants were; disposal of farm materials that are no longer useful (tires, ag plastic, pesticides, etc.), microplastics, PFAS (per- and polyfluoroalkyl substances), non-target pollinator exposure, non-target rodenticide exposure, and introduction of new weeds/pests from incorporating off-farm inputs. The challenges to reducing the use of agricultural inputs that cause environmental concern identified by the majority of respondents from the Northeast and from Vermont is the lack of available alternatives. A summary of the responses can be found on the AIB website: Agricultural Innovation Board (AIB) 2025 Agricultural Inputs Survey Results (Part 2).

Taking the 2024 and 2025 survey results into consideration, the Board began to address the concern of farmers about the environmental impact of agricultural waste, including tires and plastic, identified by survey participants. The Board learned about disposal options for agricultural plastic waste and alternative agricultural plastics that potentially have less environmental impact. In addition, the Board continued to consult with the Agency of Agriculture, Food and Markets on topics relevant to its legislative responsibility regarding pollinator protection and Act No. 182 of 2024: An act relating to banning the use of neonicotinoid pesticides.

The Board understands that these survey results do not fully encompass all areas of concern or reflect the issues of most importance to Vermont farmers. Vermont farmers are facing significant challenges currently, highlighted by the historic drought suffered in Vermont in 2025 (Agency of Agriculture, Food and Markets 2025 Agriculture Drought Impact Survey Results Dashboard). The Board recognizes the limited response rate for the 2024 and 2025 surveys and plan to discuss and develop a survey strategy that will increase participation, gather relevant information, and assess issues that are of importance and impacting Vermont farmers.

Work of the Board

The Agricultural Innovation Board's primary focus in 2025 was learning about existing programs, recommendations and regulations in Vermont, other states, and Canada relevant to disposal of agricultural plastic and tire waste. The Board researched extended producer responsibility regulations and current programs to gain a better understanding of their benefits and challenges. Eleven subject matter experts from Vermont state government, non-profit organizations, farmer cooperations, and the plastic recycling industry presented to the Board in 2025. Summaries of relevant information outlined below were summarized from meeting minutes recorded by Board member, Morgan Griffith, with the assistance of a generative artificial intelligence, ChatGPT. The content has been reviewed and verified to be accurate and complete, and represents the intent of the Agricultural Innovation Board. Meeting recordings, presentations, and materials are archived by the Agency on the AIB website Previous Agricultural Innovation Board Meetings | Agency of Agriculture Food and Markets [https://agriculture.vermont.gov/previousAIBmeetings].

Summary of Agricultural Plastic Relevant Information Received by AIB 3/24/2025

Introduction to Agricultural Plastic – Stephanie Smith, Deputy Director, Agency of Agriculture, Food and Markets

Agricultural plastics play a vital role in Vermont's farming operations, spanning crop production, livestock management, nurseries, and other agricultural uses. These materials include plastic mulch, irrigation tubing, bale wrap, twine/netting, bunker covers, silage tubes, maple tubing, greenhouse covers, and pesticide containers, among others. While they offer significant agronomic and environmental benefits—such as improved weed control, increased quality and longevity of feed, and reduced silage leachate—they also pose substantial waste management challenges.

Currently, most agricultural plastics in Vermont are disposed of in landfills, with limited opportunities for recycling or reuse. Disposal costs were estimated at $125 per ton ($0.065/lb) in 2019 and are likely higher today. Recycling infrastructure is sparse, and producers face logistical barriers such as lack of storage, transportation challenges, and limited market demand for different types of recycled plastics.

Several pilot recycling programs have been attempted in the Northeast, including efforts by the Northeast Waste Management Officials Association, Casella and Agrimark/Cabot, and the New York agricultural plastics initiative—all of which have since ceased. A notable exception is the ongoing program by the Maine Organic Farmers and Gardeners Association, which recycles LDPE #4 greenhouse plastic.

The Agricultural Container Recycling Council (ACRC) is a non-profit organization that currently offers a free service in Vermont for recycling clean HDPE plastic pesticide containers through its contractor, Ag Solutions. [Later in 2025, ACRC switched contractors to RPM Eco, who presented about their capabilities and business model during the July 28, 2025 AIB meeting (see summary below)]

In 2024, the Vermont Agency of Agriculture, Food & Markets (AAFM) held listening sessions where farmers expressed a strong desire for accessible recycling options. AAFM has committed to working with

the Department of Environmental Conservation (DEC) and other partners to develop policies and solutions that address the disposal and recycling of agricultural plastics.

Bale Wrap Recycling Program – Mike Snow, Executive Director, Connecticut River Watershed Farmers Alliance

The Connecticut River Watershed Farmers Alliance (CRWFA), led in part by grower and part-time executive director Mike Snow, is launching a 2025 pilot project focused on recycling agricultural plastics, specifically bale wrap. CRWFA serves farmers on both sides of the Connecticut River in Vermont and New Hampshire, promoting cooperative problem-solving through monthly workshops and field days. The organization recognizes the benefits of plastic in organic agriculture, particularly for weed suppression, but also acknowledges the environmental and logistical challenges associated with its disposal. The benefits of bale wrap and bunk wrap include less run-off of nutrients and protection from changes in weather when harvesting feed. Use of bale and bunk wraps is often part of water quality programs on farms and although farmers don't like using these agricultural plastics, they find it difficult to exist economically without them. There are limited recycling programs available currently because some markets will not accept plastic that is not washed and washing bale and bunk wrap is not practical for the majority of farmers.

The pilot program enables farmers to join CRWFA for a $50 membership, which includes access to super sack totes for collecting clean, dry bale wrap. These totes are transported to solid waste districts in Lebanon, NH; Brattleboro, VT; and Lyndonville, VT, where the plastic is compacted into bales. Once a full truckload is ready, CRWFA delivers the bales to EFS Plastics in Pennsylvania for processing. CRWFA pays the districts for their time and ensures they are not burdened with storing the baled material, making them more willing to participate. Over 50 farms have already joined the program, with more interested from the northern part of the state, pending transportation logistics. A Working Lands grant is helping CRWFA address these logistical challenges.

The goal of the program is to make recycling cost-competitive with landfill disposal and convenient for farmers. Although no bales have been sold yet, CRWFA anticipates earning $0.04–$0.06 per pound, which should cover transportation costs to Pennsylvania. The program is learning from past efforts, such as Casella's discontinued pilot, and is committed to improving economic viability. CRWFA also plans to evaluate the carbon footprint of the program and welcomes collaboration with local researchers to better understand its environmental impact.

EFS Plastics processes the bale wrap into pellets, which are typically used to manufacture trash bags. There is opportunity to ask EFS Plastics about different types of durable goods that could be made from recycled materials, i.e. fence posts or sidewalk panels. The organization is also investigating solutions for bunk cover disposal and sees potential in tire recycling, noting that Vermont's Agency of Agriculture, Food & Markets (AAFM) has a tire slicer that reduces mosquito habitats and makes tires easier to handle. Legislative interest in tire recycling is growing, with H.204 currently under review in the Vermont House Committee on Environment.

CRWFA is also engaging with national organizations like the Agricultural Container Recycling Council (ACRC) to learn more about recycling rigid plastic containers and the types of products that can be made from different recycled materials. The National Organic Program (NOP) requires annual removal of plastic and prohibits biodegradable options because none exist that don't have prohibited substances

when they break down. However, European and Canadian organic standards allow biodegradable plastics, presenting an opportunity for Vermont's organic producers to research and test acceptable alternatives. CRWFA is committed to advancing these conversations and developing practical, sustainable solutions for agricultural plastic use and disposal.

5/19/2025

Tire Extended Producer Responsibility in VT – Shannon Choquette, Environmental Analyst, VT Department of Environmental Conservation

Vermont generates approximately 645,000 scrap tires annually, yet remains one of only 14 states without a formal scrap tire management program. While Act 78 banned landfill disposal of waste tires in 1992, the state continues to face challenges related to tire disposal, including illegal dumping, fire hazards, mosquito breeding, and pollution. Most of Vermont's scrap tires are processed by BDS Recycling in Maine, which recently expanded to manufacture crumb rubber used in products like flooring, dairy cow mattresses, and artificial turf. Tires unsuitable for crumb rubber—primarily passenger and light truck tires with textile components—are typically used as tire-derived fuel (TDF), especially in Maine paper mills. Although TDF is not classified as recycling under Vermont law, it diverts tires from landfills and enhances combustion efficiency in other fuel sources. Nationally, 33% of disposed tires are used as TDF, 28% are converted to crumb rubber, 19% are disposed in landfills, and 5% are exported to other countries (i.e. India where disposed tires are burned for fuel).

Despite the value of TDF and crumb rubber, disposal costs remain high due to transportation and processing infrastructure. Farmers and other generators must often pay for tire disposal, which contributes to ongoing concerns about illegal stockpiling. A 2013 survey under Act 148 estimated that 500,000 tires remained in Vermont and would cost $1 million to dispose of properly. While the state lacks large illegal tire piles, scrap tires are still considered a difficult waste stream to manage, ranking second only to household hazardous waste in a national survey of 39 states.

To address these issues, Vermont lawmakers have repeatedly introduced tire extended producer responsibility (EPR) legislation, including bills in 2015, 2017, and most recently H.628 (2024) and H.204 (2025). These proposals aim to shift the burden of tire disposal from consumers to manufacturers by requiring them to establish statewide collection programs at no cost to the public. The 2016 Tire Stakeholder Group recommended implementing a fee at the point of purchase or vehicle registration to reduce illegal dumping and improve recycling outcomes. H.204 also refines the definition of legacy tire piles, lowering the threshold from 100 to 50 tires and excluding sliced tires used in agricultural silage bunkers. While H.204 has not advanced this session, the Department of Environmental Conservation (DEC) continues to support EPR as a long-term solution. Enforcement of illegal tire piles is currently handled under solid waste facility regulations, with property owners held financially responsible for cleanup. As Vermont explores sustainable waste management strategies, tire EPR remains a promising policy tool to improve environmental outcomes and reduce the burden on consumers and municipalities.

Basics of Plastics & the Claims, Uses and Issues with Compostables – Ben Gauthier, Environmental Analyst, VT Department of Environmental Conservation

Plastics play a complex and evolving role in Vermont's organics management landscape, particularly within solid waste composting, anaerobic digestion, and depackaging facilities. Traditional hydrocarbon-

based plastics, derived from petroleum, are highly stable and persist in the environment, even when physically degraded. While technologies like pyrolysis can break these polymers into their components such as biochar, water, tar, liquid, waxes etc., the process is energy-intensive and not currently available in Vermont. Alternatives such as oxo-degradable plastics fragment into smaller pieces rather than fully biodegrading, raising concerns about soil health and agricultural impacts due to microplastics. Compostable plastics, especially those made from polylactic acid (PLA) derived from corn starch or sugarcane, offer a more promising solution. These materials are designed to break down in controlled composting environments with heat, moisture, and microbial activity.

However, the industry faces challenges in defining and certifying terms like "bioplastic" and "compostable." The Biodegradable Products Institute (BPI) is leading efforts to standardize compostability through rigorous certification processes that include testing for PFAS, biodegradation rates, and field performance. Despite lab-based compostability tests, real-world conditions often differ, especially in agricultural settings where plastics are thicker and not ground into powder. The Compost Manufacturing Alliance is working to establish field testing protocols to ensure compostable products perform as expected. Mislabeling remains a significant issue, with some products falsely marketed as compostable, complicating sorting and contaminating finished compost. BPI has certification process for using term compostable and has list on their website of their certified products - BPI - Certified Compostable.

Agricultural applications of plastics, such as bale wrap and row covers, present additional hurdles. Bale wrap recycling is particularly difficult due to contamination from soil and gravel, making it hard to meet cleanliness standards required by recyclers. While some retailers are forming cooperatives to recycle pallet wrap, farm-generated plastics pose unique challenges. Compostable alternatives for bale wrap are not yet viable, though interest in developing such solutions is growing. Research into barrier properties of compostable plastics and their suitability for agricultural use is ongoing, with food manufacturers driving innovation.

Concerns about microplastics and nanoplastics are increasing, especially regarding their mobility in soil and water and potential uptake by crops and animals. Additives in non-certified plastics, including PFAS and flame retardants, further complicate environmental safety. Vermont's Department of Environmental Conservation (DEC), through the Pollution Prevention (P2) grant and Act 170, has initiated studies to assess microplastic contamination in compost and digestate. Preliminary findings suggest Vermont's feedstocks are relatively clean, though isolated cases—such as polypropylene microfibers traced to grain bags—highlight the need for further research.

Efforts are underway to explore agricultural biodegradable options and identify credible speakers and resources for future discussions. The Vermont Agency of Agriculture, Food & Markets (AAFM) and the Agricultural Innovation Board (AIB) are committed to advancing understanding and solutions around plastic use, recycling, and environmental impact in agriculture.

7/28/2025

Cleanfarms – Shane Hedderson, Director, Western Canada, Cleanfarms

Cleanfarms is a national Producer Responsibility Organization (PRO) dedicated to eliminating agricultural plastic waste from landfills across Canada. With 225 member companies spanning pesticides, fertilizers, seeds, animal health products, feed, and maple tubing, Cleanfarms operates across all agricultural

sectors. Since its inception in 1989 as a pesticide container recycling initiative, the organization has steadily expanded its scope to include obsolete medications, fertilizer containers, bulk pesticides, seed bags, grain bags, twine, silage film, and most recently, maple sap tubing. Cleanfarms now manages eight core permanent programs, with recovery rates ranging from 33% to 81%, depending on the material and region. Despite these efforts, only an estimated 16% of total agricultural plastics are currently collected, largely due to the early-stage development of Extended Producer Responsibility (EPR) legislation for ag plastics which Cleanfarms relies upon in order to fund the collection programs.

Cleanfarms operates over 2,300 collection sites nationwide, including ag retailers, municipalities, farms, and other agricultural stakeholders. Materials are collected through both scheduled municipal pickups and on-demand retail requests, facilitated by a digital platform that also provides educational resources and sustainability reporting. Farmers are encouraged to prepare materials properly—such as triple-rinsing containers and storing plastics in collection bags that are received at time of plastic purchase — to ensure successful recycling. Cleanfarms contractors then process the plastics, which are repurposed into products like agricultural drainage tiles, fence posts, pallets, and curb stops. Cleanfarms webpage has an educational video about the variety of products made from the plastics that are recycled - What Becomes What – Cleanfarms. The organization also runs blitz-style collection events every three years for unwanted pesticides and livestock medications, and recently launched a maple tubing collection program in Quebec, recovering over 700 tons in its first year.

To improve logistics and reduce the burden of transporting bulky, lightweight materials, Cleanfarms is testing on-farm compactors and baling techniques. The organization emphasizes cost-efficiency by collecting fees from manufacturers, which helps keep participation affordable for farmers. Fees vary by product and region, with some regulations requiring visible charges at point of sale. Cleanfarms maintains that farmer cooperation is strong, though cleanliness of materials—particularly bale wrap and seed bags—remains a challenge. Educational campaigns and guidance from industry partners like Seeds Canada help address issues such as dust control and proper disposal of treated seed bags, which currently go to energy-from-waste facilities due to their complex composition.

Cleanfarms continues to work closely with provincial regulators to harmonize EPR programs and ensure agricultural plastics are managed separately from residential waste. The organization stresses the importance of designing regulations that reflect rural realities and agricultural product types. Cleanfarms's key considerations to be successful in agricultural plastic recycling programs are: (1) keep costs as low as possible through operational efficiencies; (2) collect fee from manufacturers to then keep cost to farmers as low as possible; (3) farmers want to do the right thing, build convenient, accessible programs so they participate; and, (4) work closely with regulators on EPR, since ag plastic is different, it's not always easy to find end market contractors to recycle it and the regulations should not be combined with consumer goods policy and instead be developed with rural landscapes and products in mind. Through consistent communication, operational innovation, and collaborative policy development, Cleanfarms is building a more sustainable future for agricultural waste management in Canada.

RPM eco – Pierre Gendron, Vice President and General Manager, RPM eco

RPM Eco is a Canadian-based company recognized as one of the most advanced recyclers of empty plastic containers, holding over 60% of the Canadian market share. With 22 years of experience, the company operates five collection sites across Canada, three strategically located accumulation centers,

and a centralized recycling facility in Quebec that focuses on agricultural and oil containers. Since June, RPM Eco has expanded into the Northeast United States as a contractor with the Ag Container Recycling Council (ACRC). Their innovative "No Touch Safe Handling System" ensures that collection bags remain sealed and are mechanically recycled into bales, minimizing contamination risks. They also employ treated industrial wastewater—sourced from industries, garages, and spill sites—as a cleaning agent, recycling the water repeatedly with minimal loss. Artificial intelligence is used to predict collection sites and timing, making the program more efficient and sustainable. RPM Eco serves diverse industries including agriculture, automotive, construction, manufacturing, municipal services, and mining, and produces eight types of 100% post-consumer resins (PCR), which are increasingly in demand as legislation requires minimum PCR content in products like beverage containers. With a recycling rate of 95%, their end products include oil containers, five-gallon buckets, and garbage carts, all sold to local markets rather than overseas. Participation in their program is high because consumers prepay for collection services when purchasing containers, and RPM Eco ensures quality by training drivers to check that containers are triple-rinsed and properly bagged. Since 2024, they have collected over two million pounds of plastics in Quebec, and early U.S. efforts are underway with ACRC estimating 5,000 pounds in Vermont. By separating and processing plastics themselves, RPM Eco avoids contamination issues common in curbside recycling, and they see PCR integration into new containers as a gamechanger for market demand. While the company acknowledges that plastics can be recycled multiple times, they believe the potential for reuse is nearly infinite.

Extended Producer Responsibility Programs in VT – Mia Roethlein, Environmental Analyst, Vermont Department of Environmental Conservation

Extended Producer Responsibility (EPR) programs in Vermont, overseen by the Department of Environmental Conservation's Solid Waste Program, are often referred to as "special recycling" initiatives. Rooted in Act 78 of 1987, which established sanitary landfills and municipal solid waste management entities, these programs embody product stewardship—ensuring that producers take responsibility for their products and packaging throughout their entire life cycle. Vermont currently has five EPR laws covering electronics, mercury thermostats, paint, mercury-containing bulbs, and batteries, all designed to provide free, convenient recycling options, often through partnerships with retailers. The Vermont E-Cycles program is state-run, while the Paint Stewardship program operates under an advanced consumer fee or "eco-fee," and the Battery Stewardship program is fully funded and implemented by manufacturers. Since 2016, battery recycling has expanded to over 180 locations and is poised to include tool batteries such as those for e-bikes and lawn equipment. Mercury thermostat collection began in 2010 and includes a $5 rebate, though participation has declined as fewer mercury thermostats remain in homes. Paint recycling is robust, with 82 year-round collection sites and large-volume pickups; notably, 76% of latex paint collected is recycled back into new paint, with some sold locally by the Chittenden Solid Waste District. The fee associated with the paint recycling program is established in Vermont statute and the Paint Care program is responsible for keeping track of the fees collected and used within program. They have never had a surplus budget, the program is always collecting more paint than what has been sold with the fee implemented. Looking ahead, Vermont passed the nation's first Household Hazardous Waste (HHW) EPR law in 2025 (Act 59), with the first collection plan due in 2026. This law covers a wide range of products, excluding pesticides, and addresses the high costs municipalities face in managing HHW. Challenges remain, particularly around manufacturer participation in stewardship organizations, but the law allows the state to directly bill

manufacturers if necessary. Importantly, all existing EPR programs correlate with landfill bans, as they target toxic and hard-to-manage materials, ensuring that bans are paired with viable recycling solutions.

Board member discussion to create framework to make recommendation of practices to reduce the use and generation of waste associated with plastic in farming

Participants explored strategic directions for advancing agricultural plastic recycling in Vermont. A key challenge identified is the absence of a formal recycling system for agricultural plastics, which complicates planning efforts. However, members mentioned the benefit of planning and pilot programs before any potential regulatory bans or required extended producer responsibility programs. Board members emphasized the need to narrow the focus to specific plastic types, identifying which materials are most commonly used and hardest to dispose of, such as bale wrap, twine, and maple sap tubing. However, a lack of data—particularly on pesticide container sales and other types of agricultural plastics used —limits the ability to assess waste generation and design effective programs.

The group discussed the potential benefits of inviting experts who manufacture end products from recycled agricultural plastics, such as plastic particle board, to better understand market opportunities, business models, and how different values of different types of plastic may help prioritize AIB's recommendations of programs to pursue. Learning from Quebec's regulatory framework for agricultural plastic recycling was also highlighted as a priority, given its more advanced Extended Producer Responsibility (EPR) programs and provincial regulations. Members considered whether Cleanfarms, a Canadian PRO, might expand into the U.S. or Northeast region to support similar initiatives.

To improve program viability, the board proposed exploring synergies with other sectors, such as automotive and farm machinery, especially through organizations like RPM Eco that collect oil containers. Increasing collection volumes across industries could enhance the feasibility of recycling infrastructure. Questions were raised about Vermont's regulations and voluntary programs for oil container disposal, as well as the value and recyclability of different plastic types used in agriculture.

Finally, the group expressed interest in understanding emerging regulations around post-consumer recycled (PCR) content requirements in products, which could influence future recycling markets. The session underscored the importance of targeted data collection, cross-sector collaboration, and regulatory insight to build a sustainable and scalable agricultural plastic recycling program.

9/22/2025

Quebec agricultural plastic extended producer responsibility regulation overview & Cleanfarms Eastern Canada EPR program – Kim Timmer, Eastern Canada, Cleanfarms

Extended Producer Responsibility (EPR) regulations in the agricultural sector are reshaping how plastic waste is managed across Canada. Cleanfarms, a national Producer Responsibility Organization (PRO), plays a central role by operating recycling programs funded by producers, enabling members to be in compliance with provincial regulations. Their mission is to help farmers recycle hard-to-manage agricultural plastics and build a circular economy, coordinating the movement of materials from over 190,000 farms to a network of recyclers. EPR policies place the legal obligation for recycling on the producer—not the farmer—requiring them to finance and operate approved programs or delegate responsibility to organizations like Cleanfarms.

Internationally, regulatory momentum is growing with the UN Global Plastic Treaty under negotiation and the FAO's voluntary Code of Conduct on Agricultural Plastics launching in 2024. Nationally, Canada's CEPA designation of "plastic manufactured items" and single-use plastic bans add further context. Provincially, EPR programs vary: Manitoba began in 2011, Saskatchewan in 2018, and Prince Edward Island and Quebec launched comprehensive regulations in 2022–2023. Quebec's regulation covers seven categories of agricultural products and packaging, including bale wrap, silage bags, pesticide containers, greenhouse plastics, and maple tubing. Legal obligations fall on the first seller or supplier, with farmers exempt unless they import products directly in certain provinces.

Producers must develop and finance government-approved programs, often choosing to join Cleanfarms due to the complexity and cost of running independent systems. Regulations have complex criteria that need to be met for the program, therefore it is difficult for plastic producers to build a program on their own. In addition, it is more sustainable to pool the waste so logistics can benefit from larger scale of operation.

These programs must meet performance targets and are funded through levies or ecofees—typically 7–10% of product cost for hay and silage-related items, and lower for pesticides. While farmers ultimately bear these costs through product pricing, subsidies are rare, though provincial governments may support pilot projects. Cleanfarms recommends a two-year implementation window for new regulations, citing Quebec's one-year timeline as challenging.

Key lessons include the importance of involving producers early in policy development, conducting agricultural waste studies to quantify plastic volumes, identifying viable collection sites and recyclers, and piloting programs to test regional feasibility. Enforcement remains a challenge, relying on government capacity and industry cooperation. Without broad producer participation, programs face financial strain. Vermont's past pilot program may have struggled due to limited material volumes and funding constraints, underscoring the need for sustained investment and scalable infrastructure. As EPR regulations evolve, strong collaboration between regulators, producers, and recycling organizations will be essential to ensure long-term success.

Nature's Net Wrap compostable net bale wrap – Austin Ruud & Larry Ruud, Nature's Net Wrap

Nature's Net Wrap is a family-run business based in western Canada, driven by a commitment to solving environmental challenges in agriculture through sustainable innovation. Recognizing the widespread use and disposal issues of plastic net wrap and twine, the company developed a plant-based, compostable alternative made from renewable biopolymers. Their product maintains durability for over 12 months and is compatible with existing baling equipment, requiring no modifications. The company notes the importance of explaining the difference between compostable and biodegradable terms. Some states are banning use of term "biodegradable" because it is very open ended. Not everything that is biodegradable is compostable. Nature's Net Wrap product is certified compostable by the Biodegradable Products Institute (BPI) and validated through third-party ecotoxicity testing, Nature's Net Wrap ensures environmental safety by eliminating concerns about heavy metals and harmful contaminants.

Field studies conducted with Lakeland College have demonstrated effective decomposition across various soil types, including successful trials in silage bale conditions in Europe. While not yet OMRI-listed for organic certification, the product is already being used by organic operators, and the company

is exploring the certification process. Most customers compost the wrap on-farm, often integrating it into manure packs. Ongoing research with the University of Saskatchewan and Lakeland College is examining its digestibility in cattle and behavior in liquid manure environments, with early feedback suggesting microbial activity aids decomposition.

Though the compostable wrap carries a $1.50–$1.75 per bale premium over traditional plastic net wrap, customers report that the cost is offset by reduced labor, equipment damage, and disposal expenses. As the business scales, Nature's Net Wrap aims to reduce this premium further. The company also sees potential in developing compostable film plastics to address broader agricultural plastic waste issues.

Environmentally, the product offers over 50% emissions savings in manufacturing compared to conventional plastic net wrap and targets a significant reduction in agricultural plastic waste, which is largely composed of net wrap and twine. One of the main challenges remains building awareness and adoption of this alternative, especially as equipment manufacturers increasingly favor net wrap systems over twine balers. Nature's Net Wrap continues to engage with farmers, researchers, and industry stakeholders to expand its impact and support a more sustainable future for agricultural operations.

12/8/2025

Ben & Jerry's Caring Dairy Program: Agricultural plastics membership data – Tom Gates, Ben & Jerry's Caring Dairy Program

Tom Gates from Ben & Jerry's presented to the Board about the Caring Dairy program's data on agricultural plastics recycling, discussing trends in recycling practices, challenges with cleaning plastics, and the potential for collaboration on survey questions to support the board's annual farmer survey requirements. Tom Gates described the Caring Dairy program's holistic approach, including annual metric surveys of participating farms, and shared data showing an increase in the number of farms recycling agricultural plastics over the past four years. The program tracks recycling of bunker plastic, bale wrap, and plastic drums, with notable growth in drum recycling attributed to supplier rebate programs for returning and reusing containers. Leon Corse and Tom Gates discussed the difficulty of cleaning bale wrap and bunker covers for recycling, noting that contamination with mud and feed residue is a major barrier to acceptance by recyclers. The AIB explored the possibility of adding targeted questions to the Caring Dairy survey to help the board gather data on obstacles to recycling and specific cleaning practices, aiming to reduce the survey burden on farmers.

Organic Valley Cooperative Wisconsin agricultural plastic recycling pilot program overview – Zach Biermann, Organic Valley Cooperative

Zach Biermann from Organic Valley shared details of past and ongoing agricultural plastics recycling initiatives, including cost-sharing dumpster programs, challenges with cleanliness and logistics, and the role of recycling companies like Revolution Plastics in providing free collection services in the Midwest. Organic Valley's nine-year pilot program placed dumpsters at ten locations for 110 farms to recycle vegetable plastic mulch, collecting over 260 tons of plastic at a total cost of $44,000, with farms now self-funding the ongoing system. Zach Biermann explained that recycling companies have developed mechanical washing systems to handle dirty agricultural plastics, reducing the need for farmers to extensively clean materials before recycling. In 2012, Terrecon was hired by Organic Valley to study agricultural plastic on dairy farms. This study estimated 264,000 pounds of plastic waste per year in WI, which is an average of 8-15lbs per cow per year. Revolution Plastics provides free dumpsters and pickup

for silage bags and bunker covers in the Midwest, with farmers responsible for keeping plastics as clean as possible and the company monitoring for contamination.

Key ag plastic recycling program challenges identified include high costs, contamination, and collection logistics, while limited alternatives to plastic and the need for market development for recycled materials remain ongoing concerns. Discussion included the emergence of biodegradable net wrap products and the regulatory hurdles for organic certification, as these materials must be approved as soil amendments for use on organic farms.

Summary of Neonicotinoid Relevant Information Received by AIB

1/27/2025

Neonicotinoid Research Update – Heather Darby, PhD, Agronomic and Soils Specialist, University of Vermont Extension

Preliminary results from ongoing neonicotinoid research in Vermont reveal a complex picture of seed treatment efficacy, environmental impact, and pest management challenges. Seed treatments, commonly used to protect crops from disease and insect damage in cold, wet conditions, include a mix of insecticides, fungicides, and other additives. However, their effectiveness varies widely depending on crop type, planting date, field conditions, and management practices. Dust generated during planting has been a concern, with past studies showing insecticide-laden particles released from planters. Recent UVM research revisited this issue using dust collection units and vacuum bags to test different seed lubricants. Results showed that graphite released significantly more clothianidin than Bayer's fluency agent, and seed brand influenced how well treatments adhered to seeds. Methodology and results summary:

- UVM research collected dust during planting with dust collection units placed downwind from planted area.
- Dust collection units collected dust on slides with sticky substance at 0cm, 30cm, and 200cm above ground.
- Collected weather, and soil conditions at farms when the dust collection occurred. 2024 was a wet spring so there was not a lot of dust generated. Most fields planted were on sandy soils, because challenging years to plant in wet fields. Overall, there were not good conditions to create dust during planting.
- Dust collection units were located at the edge of the field so the planter started next to collection units then moved away about 500ft as continued to plant through field.
- Detection limit <0.43 ng/cm^2
- One clothianidin detection in Middlebury farm 0.7 ng/cm^2 at soil surface
- Dust collection directly from planter project with the objective to compare neonicotinoid levels in dust released from planter when using different seed fluency agents
    - Vacuum bag placed over planter exhaust
    - Corn Research Consortium (CRC) showed some fluency agents were more abrasive than others against the seed treatment. There was not a strong recommendation because the results were variable. Since CRC research, seed treatment has improved so Heather wanted to test this again

    - Collection slides were placed in the vacuum bag
    - Looked at 4 different fluency agents: graphite, talc, DUST (soybean based product), Bayer Fluency Agent
        - DUST had cakey texture and may have challenges for VT growers working in wet/humid conditions
        - Graphite was significantly higher in concentration of clothianidin detected in dust collected than Bayer Fluency Agent, but not clear differences between other treatments.
        - Detections ranged from 4500-20000 µg/cm^2
- Compared two different seed brands that had the same seed treatment (lumigen at same 1250 rate), one brand seemed to have higher clothianidin detections in dust collected directly from planter across all seed lubricants.
    - Shows there is a difference in how the seed coatings are keeping the treatment on the seed.
    - Bayer fluency agent significantly suppressed amount of neonic abrading off of the seed, regardless of seed company, whereas graphite significantly abraded seed treatment off of one seed company tested, more than the other.

Water quality monitoring at Discovery Acres in the Jewett Brook watershed found clothianidin in both tile and surface runoff samples, especially following heavy rainfall:

- At St. Albans Bay, in Jewett Brook watershed, heavy clay/poorly trained soil field at Discovery Acres. 3-6 acres each of 4 plots under different management practices i.e. conservation tillage, manure injection vs broadcast, etc.
- 2023 Heavy rainfall resulted in flush of clothianidin from tile and surface runoff water samples
- 2024 was a drier year (less samples were collected)
    - 14 out of 29 (48%) tile samples had detectable levels of clothianidin (>1.0 ug/L)
    - 7 out of 25 (28%) surface runoff samples had detectable levels of clothianidin
    - No detectable levels of clothianidin until June 7, 2024
    - No sampling since end of August because the weather has been dry so water hasn't triggered sampling
    - 2024 results were similar to previous year

Soil testing revealed persistent clothianidin residues, even in fields with no prior neonic-treated seed use, suggesting environmental persistence and potential degradation over time:

- Clothianidin levels in soil before planting at Discovery Acres
    - Field was in its 4th year of corn (all neonic treated corn planted)
    - Preplant soil testing in April each year
    - 2023 88% of samples detected clothianidin at 0-2.5", 44% of samples detected clothianidin at 2.5-6"
    - 2024 44% of samples detected clothianidin at 0-2.5", 44% of samples detected clothianidin at 2.5-6"
        - Possible due to less rain, but hard to say
    - End of season soil testing (Nov 2023/Oct 2024)
    - Much higher percentage of samples contained detectable clothianidin at both depths and in both years.

- Clothianidin in soil in site (Alburgh, VT) that had not had neonic-treated seed planted previously. Planted neonic-treated seed with goal to monitor clothianidin levels in soil over time.
    - In May 2023 before planting, did see some clothianidin in 2.5-6" depth
    - Clothianidin was detected in some samples throughout 2023 growing season
    - In April (preplant) 2024 saw no detectable levels of clothianidin in any samples
        - Possibility of neonic degradation, but a lot of factors at play, weather, soil conditions, etc.

Pest pressure remains high in Vermont, particularly from grubs and wireworms in sod rotations. Management practices such as tillage and manure application were linked to increased risk of seed corn maggot damage, while no-till systems without manure showed the lowest risk. Cover crops did not significantly affect pest damage in one year of data, but farmer concerns persist, prompting calls for more education and nuanced discussions:

- UVM research studying different management practices and combination of practices and risk to pest damage (till, no till, broadcast vs injected manure, cover crop etc.)
- Results highly variable, planted very early in cold and wet conditions, worked with a statistician to understand percent probability of having damage
    - Probability/Risk of damage significantly higher if tilling or adding manure.
    - Lowest risk of damage with no-till and no manure applications.
        - Hypothesis that tillage is speeding up decomposition which is attractive to pest
        - Recommendation is typically if you plow under lots of lush green material you should wait 2-3 weeks before you plant. But not always an option for VT growers
    - Did not see differences with cover crop vs no cover crop in seed corn maggot damage (only one year data)
    - Tilling and manure happened within a week of planting
    - Ross Saxton has heard from several farmers this past year that they want to be cautious with cover crops because they are making the assumption that cover crops without neonics is going to cause more problems and crop loss. Wants to facilitate discussion and education about what we know with growers at upcoming conferences so we don't lose a lot of the progress we have made over recent years about benefits of cover crops.
    - Recommendations depend on the cover crop, the majority of the cover crops in VT, if left to get large and then are typically no-till (herbicide burndown) which doesn't seem to be as conducive to pest damage. And most of what VT has as cover crops is grass, which doesn't seem as attractive. Ongoing research is needed to fully understand and formulate recommendations about cover cropping practices and how they impact risk for pest damage.
        - Cornell has done a similar study and they also did not see an effect of cover crops on pest damage.

Flight monitoring of corn seed maggot did not reliably predict crop damage, and plant stand assessments showed losses regardless of seed treatment. Comparative trials of diamides and spinosad as alternatives to neonics found similar reductions in seed damage when insecticides were used, though diamides offer lower toxicity and water solubility. Corn populations were reduced across all treatments,

with the greatest losses in untreated controls. Soybean trials showed less damage overall, with no significant differences among treatments. Researchers plan to expand these studies in 2025 to include more on-farm sites and refine understanding of the conditions that lead to yield loss:

- Diamides vs neonicotinoid seed treatments
    - Diamides are more expensive to produce, have lower toxicity to non-target insects compared to neonics, and are not as water soluble
    - Looked at diamides and spinosad seed treatments (with fungicide) in comparison to no treatment, fungicide only and neonicotinoid and fungicide treated seeds.
        - Saw corn seed damage reduced (compared to control or control with bone meal) by fungicide only, and reduced again to 24-25% damaged seed when add insecticide (no difference which type)
- Corn populations by seed treatment, 2024
    - Planted at 36000 plants/acre
    - Corn populations were reduced regardless of seed treatment, but reduced significantly more in control and control with bone meal. No difference amongst seed treatments
- Same study in soybeans had overall less damage than corn, but saw most damage in control with bone meal. No difference in damage amongst control and insecticide seed treatments
- Going to repeat all these studies in 2025, expanding on farm sites (2024 on farm data not completed yet so not shared today)

Collaboration with Cornell has reinforced the difficulty of linking pest activity to economic impact, underscoring the need for continued research and adaptive management strategies. We are having trouble identifying risk and what translates into yield loss. Researchers have seen yield loss, but what are the conditions that lead to that loss is the focus of research currently.

Neonicotinoid Treated Article Seeds and Neonicotinoid Pesticides Best Management Practices Draft Rule Update

Draft rule and the accompanying filing set information is currently under AAFM internal review before submitted to the Senate Committee on Agriculture and the House Committee on Agriculture, Food Resiliency, and Forestry for review as required by 6 V.S.A. § 1105a. AIB members had no further comments on the draft rule and acknowledge there will be more opportunities for comment throughout the formal rulemaking process.

9/22/2025

Neonicotinoid research update – Heather Darby, PhD, Agronomic and Soils Specialist, University of Vermont Extension

The ongoing neonicotinoid research project in Vermont is evaluating the effectiveness of neonicotinoid-treated seed (NTS) in suppressing early-season pest damage and improving crop yields compared to fungicide-only treatments. In 2024, trials across eight corn fields showed no statistically significant differences in corn populations between seed treatments. In 2025, the study expanded to 14 fields (11 corn, 3 soybean) and assessed crop performance at four growth stages. Preliminary findings suggest that planting date plays a critical role: early May plantings experienced lower corn populations and higher seed corn maggot (SCM) damage, while mid-to-late May plantings yielded better results, with NTS outperforming fungicide-only treatments:

- 2025 14 fields (11 corn, 3 soybean) that were more spread out across VT
    - Assessing crops at 4 stages (seed, VE-V1, V3-V4, and harvest), comparing NTS vs fungicide-only
    - Hoping to expand in 2026, to help determine when insecticide treatment on seed is warranted and when the risk is low
- Does changing the planting date affect corn population?
    - 2024 early planting dates had lower corn populations
        - yields higher when planted end of May
        - seed corn maggot (SCM) damage higher in earlier planted corn
    - Hypothesis: If you are planting during more ideal conditions (warmer, drier) then seed will germinate quickly and not be as impacted by soil insect pests
- Trying to match SCM peak flights and corn populations based on planting date
- No difference in yield between NTS and Fungicide-only when planted early in the season (early May), when planted mid-late May NTS yield surpassed fungicide-only
- 2025 corn populations by planting dates
    - Cold and wet early in spring so very poor corn populations observed
    - Early Apil planted had higher corn population in Fungicide-only treatment, but by June planted saw similar/trending higher corn population in NTS

A fluency agent trial at Borderview Research Farm revealed that seed brand and fluency agent type significantly influenced the amount of dust released during planting. Alternatives to traditional graphite and talc—such as soy protein (DUST) and polymer-based agents—were tested, with results pending. Early 2025 conditions were cold and wet, leading to poor corn populations overall, though later plantings showed improved performance, particularly with NTS.

Additional trials compared insecticide alternatives like diamide and spinosad to neonicotinoids and fungicide-only controls, with and without blood meal organic matter. The blood meal treatment resulted in notably lower germination rates (~50%), and insecticides did not significantly improve germination over fungicide-only treatments. Management practices also influenced pest damage in 2025 research trials: tillage, manure application, and cover cropping increased SCM damage, especially when cover crops were tilled into the soil. No-till systems were less attractive to pests.

The research team is monitoring SCM flights and growing degree days to better predict pest risk, though flight data has not reliably correlated with crop damage. Plans are underway to expand the study to over 20 fields in 2026, incorporating diverse soil types and management practices. UVM supports farmer-led trials by providing seed and technical assistance. Collaboration with Cornell, which manages 50 sites in New York, is helping to contextualize Vermont's findings. Despite early-season challenges, the research is shedding light on when insecticide seed treatments are warranted and exploring viable alternatives to neonicotinoids.

Wild pollinators within established crop systems research update – Ryan Rebozo, PhD, Vermont Center for Ecostudies

The Vermont Center for Ecostudies (VCE) continues its research on wild pollinators within agricultural systems, building on foundational surveys such as the Vermont Bumble Bee Survey (2012–2014) and the Vermont Wild Bee Survey (2019–2022), which culminated in the 2022 State of Vermont's Wild Bees report. These efforts have identified 352 bee species statewide, with 20% discovered in recent years,

and highlighted 12 key bee conservation areas. Notably, 174 species were observed visiting agricultural crops, underscoring the importance of farms as pollinator habitats.

In 2025, VCE launched a pilot monitoring program across five crop types—apples, blueberries, sheep pasture, mixed vegetables, and soybeans—using both passive and active survey methods. Cavity nesting bees were a focal group due to their diversity and potential for habitat management. Nesting blocks were placed at crop perimeters in early spring and will soon be analyzed to identify nesting species and pollen sources. Transect surveys were also conducted during peak bee flight periods to document species and floral interactions. Preliminary results recorded 59 bee species, including nine rare in Vermont and one globally rare species.

Next steps include analyzing cavity nest data, mapping farms for habitat potential, and generating farm-specific recommendations. VCE aims to expand sampling and refine research questions to better understand which agricultural practices support wild bee populations. At least three participating farms have implemented UVM Extension pollinator recommendations. As data collection continues, VCE works towards their long term goals to (1) make Vermont landscapes more pollinator friendly by working with farmers, public land managers, home owners, etc., (2) build internal capacity to monitor wild bees, and (3) increase outreach and education efforts. VCE remains committed to enhancing pollinator-friendly landscapes through collaboration with farmers, land managers, and communities.

12/8/2025

Neonicotinoid Treated Article Seeds and Neonicotinoid Pesticides Best Management Practices Draft Rule Update

Final proposed rulemaking filing set has been submitted to the Secretary of State's Office and Legislative Committee on Administrative Rules (LCAR) and posted on AAFM website. The final proposed rule is expected to be on the LCAR agenda for discussion on January 8, 2026.

Organic Valley Cooperative Wisconsin agricultural plastic recycling pilot program overview – Zach Biermann, Organic Valley Cooperative

Zach Biermann from Organic Valley shared with the board details of past and ongoing agricultural plastics recycling initiatives, including cost-sharing dumpster programs, challenges with cleanliness and logistics, and the role of recycling companies like Revolution Plastics in providing free collection services in the Midwest.

- **Vegetable Plastic Mulch Recycling Program 2013-2021:** Organic Valley's nine-year pilot program placed dumpsters at ten locations for 110 farms to recycle vegetable plastic mulch, collecting over 260 tons of plastic at a total cost of $44,000, with farms now self-funding the ongoing system.
- **Terrecon Study of Agricultural Plastic on Dairy Farms 2012:** It was estimated that 264,000 pounds of plastic waste per year was generated in Wisconsin farms, which was about 8-15lbs per cow per year. Plastic types included pesticide containers, irrigation tubing, drip tape, bale wrap, maple tubing, and seedling plug trays.

- **Cleanliness and Recycling Technology:** Zach Biermann explained that recycling companies have developed mechanical washing systems to handle dirty agricultural plastics, reducing the need for farmers to extensively clean materials before recycling.
- **Revolution Plastics Collection Service:** Revolution Plastics provides free dumpsters and pickup for silage bags and bunker covers in the Midwest, with farmers responsible for keeping plastics as clean as possible and the company monitoring for contamination.
- **Challenges and Alternatives:** Key challenges identified include high costs, contamination, and collection logistics, while limited alternatives to plastic and the need for market development for recycled materials remain ongoing concerns.
- **Program wins:** While Organic Valley was tracking the program 260 tons of plastic was recycled, and the dumpster program is still running today as a sustainable agricultural plastic recycling program. The program connected farms with recycling companies and manufacturers, highlighting the closed loop system where waste becomes raw materials for new products, fostering sustainability and local economic benefits.
- **Biodegradable Products and Certification Issues:** Discussion included the emergence of biodegradable net wrap products and the regulatory hurdles for organic certification, as these materials must be approved as soil amendments for use on organic farms.

Ben & Jerry's Caring Dairy Program: Agricultural plastics membership data – Tom Gates, Ben & Jerry's Caring Dairy Program

The Caring Dairy program, managed in both the US and Europe, was initiated in 2006 in the EU and 2011 in the US, aiming to integrate environmental, animal care, and farm worker standards into dairy farming practices. Spearheaded by Ben & Jerry's, the program seeks to lead the dairy industry towards reduced environmental impact and socially responsible production, with a current emphasis on lowering farm emissions. Approximately 50 US farms, primarily in Vermont and some in Northeast New York, participate in the program. The US Caring Dairy program is structured around strategic pillars, including "Milk with Dignity" for farm worker standards, "Life for cows" focusing on animal welfare in collaboration with the Global Animal Partnership (GAP), "Regenerative & Circular agriculture" promoting healthy soils and carbon sequestration, and "Low carbon farming" to reduce emissions. The program has achieved significant impacts, such as 75% of corn acres being planted with cover crops, over 55% of farms achieving GAP certification, and 86% of acres using no-till or minimum-till practices. Participating farmers annually complete metric surveys, which have shown an increase in agricultural plastic recycling, particularly plastic drum recycling. The two major agricultural plastics used on farms are plastic barrels/drums, often returned for reuse due to supplier rebate programs, and bale wrap/bunker covers, with bale wrap being more voluminous. The program anticipates receiving 2025 results in early 2026, with a potential option for the Board to include an additional question to better understand recycling challenges and practices. A noted challenge is cleaning bale wrap sufficiently for recycling, a concern echoed by farmers and addressed within the program's ongoing efforts.

AIB Preliminary Recommendations

The Board is working towards developing a final recommendation to address the Board's requirement outlined in 6 V.S.A. § 4964:

> *(5) Recommend practices to reduce the use and generation of waste associated with plastic in farming.*
>
> *(12) Study and issue recommendations regarding the feasibility of the use of biodegradable plastics in agriculture and the promotion of the use of and production of biodegradable plastics and similar products in Vermont.*

The Board heard from multiple experts including Canadian Producer Responsibility Organization logistics and regulation specialists, a plastic recycling company representative, and multiple professionals with experience in extended producer responsibility programs and agricultural plastic recycling programs. Based on the information presented, the Board has summarized the following key learnings to date.

Agricultural plastic is abundant on Vermont farms, nurseries, and within the maple industry. Common types of plastics utilized in Vermont agriculture include: bale wrap and bunker covers; drip tape and irrigation tubing; black plastic mulch; greenhouse and high tunnel films; maple tubing; pesticide containers; and feed and seed bags. One of the main challenges the Board heard about recycling agricultural plastic is contamination. Agricultural plastics are often soiled with organic matter and are difficult and inefficient for the farmer to clean prior to disposal or recycling. Other challenges identified include the limited number of recycling facilities available locally that accept agricultural plastics contributing to high transportation costs of bulky agricultural waste material significant distances.

The following key learnings of the Board are in regards to developing policy requiring extended producer responsibility programs for agricultural plastic:

- When developing legislative policy relevant to agricultural plastic extended producer responsibility (EPR) programs, the following are important considerations: 1) involve producers early in the policy development; 2) conduct agricultural waste studies to quantify plastic volumes; and, 3) implement pilot programs to test regional feasibility
- Legislative Policies implementing extended producer responsibility program mandates should include a long enough time (2 years or more) to develop the required programs, logistics, and execution in collaboration with all interested parties.
- As EPR regulations evolve, strong collaboration between regulators, producers, and recycling organizations will be essential to ensure long-term success.
- Without broad producer participation, EPR programs face financial strain. It is important to include within the policy identification of the enforcing entity as well as enforcement capabilities, structure, resources, and capacity within the applicable state agency when developing an agricultural plastic EPR program policy.
- The model of a Producer Responsibility Organization (PRO) (i.e. Cleanfarms in Canada) facilitating the extended producer responsibility regulations and requirements for producers is a proven successful policy option since the use of a PRO pools resources and logistics, allowing for more efficient recycling programs with enough volume and collection sites to make recycling easier and practical for farmers.

Alternative options to extended producer responsibility programs and state regulations are agricultural plastic recycling programs. The Board heard about programs funded by recycling companies as well as farmer cooperatives, such as Organic Valley and the Connecticut River Watershed Farmers Alliance. The following are the Board's key learnings and next steps regarding agricultural recycling programs:

- Identifying an end market for the plastic to be recycled is essential to having a sustainable agricultural plastic recycling program.
    - Recycled plastic content requirements recently introduced in state legislatures could drive market for recycled plastic and may provide opportunity for an increased market for recycled material and more recycling companies accepting plastic waste.
- It is important to continue to learn from past pilot programs within VT to understand their challenges and changes necessary to become sustainable.

One of the Board's main focuses for 2026 is to learn more about the feasibility of using biodegradable plastics in agriculture as well as the production and options of biodegradable plastics compared to compostable plastics. In 2025, the Board received an introduction to biodegradable plastics and summarized their learnings and need for more information as follows:

- Alternative materials to agricultural plastics are very rare currently. Agency of Agriculture, Food and Markets should support research efforts looking into viable compostable/biodegradable alternatives.
- Biodegradable or alternative materials developed may not perform as well as traditional plastics, thus making adoption of use difficult and slow. The dichotomy of needing a long-term barrier for quality feed production and needing a material that breaks down in the environment is challenging.
- Current organic farming standards limit the adoption of biodegradable plastics, as they are considered soil amendments and therefore must meet those criteria.
- There is a need for clarification and education regarding the difference between biodegradable plastics and compostable plastics. The Biodegradable Products Institute is currently working towards established standards and allowable claims.

Other Topics Discussed

In addition to beginning to address the legislative charges to recommend practices to reduce the use and generation of waste associated with plastic in farming and to study and issue recommendations regarding the feasibility of the use of biodegradable plastics in agriculture, the Board kept informed as the proposed rule for best management practices for neonicotinoid treated article seeds and neonicotinoid pesticides progresses through the rulemaking process. Furthermore, the Board learned about the Agency's Apiary Program and relevant legislative bills. The Board kept abreast of policy discussions and legislative actions concerning perfluoroalkyl and polyfluoroalkyl substances.

Board Work Plan for CY 2026

In addition to supporting the rulemaking process as needed for best management practices for the use of neonicotinoid treated seeds and neonicotinoid pesticides, the Board will consult with the Agency as

the pest risk assessment process is developed in preparation for the neonicotinoid treated article seed ban that goes into effect January 1, 2029.

The AIB will continue learning more about agricultural plastic alternatives and recycling programs to be able to provide an informed recommendation in response to legislative charges 6 V.S.A. § 4964 (5) & (12)

The Board is comprised of many appointed volunteers who generously agreed to serve due to the importance of these topics to Vermont's agriculture and environment, and their dedication to serving the people of Vermont. These members have many other responsibilities, and it is necessary to annually prioritize the issues presented to them for consideration. The members must evaluate a considerable amount of information to enable the Board to develop any sound recommendations. The menu of issues listed in Table 2 reflects these considerations as well as results from farmers surveyed and public comments received. Information the Board needs for its discussions is also noted in the table. It should be recognized that some important information may still be in development over the next year and the Board will have to consider these deficits when evaluating policy recommendations.

Public Participation with the Board

Pursuant to 1 V.S.A. §§ 310-314, and in compliance with Vermont's Open Meeting Law, Board Meetings are open to the public and are noticed by posting meeting information on the Agency of Administration's Department of Libraries public meeting calendar for State Agencies, as well as the Agency of Agriculture, Food and Markets' AIB Website, at least two weeks prior to each scheduled meeting. Information pertaining to any special meetings will be publicly posted at least 24 hours in advance of the Board's meeting. Meeting time, location, call-in number, and video meeting link are provided in the notices and agendas are both provided to members and posted publicly to the AIB Website at least 48 hours in advance of regular meetings and 24 hours in advance of special meetings. Time is allotted at each meeting for public comments. Interested persons are invited to attend the meetings as noticed.

Public comments received are included in the meeting minutes and written comments received have been posted on the AIB Website.

Summary of written and oral public comments received in 2025

- American Seed Trade Association (ASTA), CropLife America (CLA), and Biotechnology Innovation Organization (BIO)
    - Letter of support for safe use of neonicotinoid treated seeds and importance of options for farmers in their operations to use treated seeds 1/27/2025
    - It is essential to develop effective and workable practices and appropriately train those who treat, handle, transport and plant the seed to help ensure that seed treatments result in successful crops and a healthy environment.
    - Mandating restrictions on use of neonicotinoid treated seeds prior to January 1, 2029, directly contradicts the general assembly's intent and the will of the General Assembly, expressly synchronizing the treated seed portion of the law with New York's law.
- Sylvia Knight, Vermont Pesticide and Poison Action Network
    - Oral comment 9/22/2025

        - 6 V.S.A. §4964 mandates AIB to find ways to reduce pesticides.
        - The Vermont Agriculture & Food System Strategic Plan: Farm to Plate 2021-2030 calls for a 20% reduction in pounds of pesticides used per year by 2030
        - Important time to address this issue as research is conducted on pesticides found in food and PFAS contaminants in pesticides
        - Encourages AIB to move on these mandates in the next year
    - Written comment 11/1/2025
        - Presentation suggestion of Nea-Tocht Farm in Ferrisburgh, VT to inform AIB about their practice of terminating cover crops without pesticides
    - Written petition (14 signatories) 11/10/2025, Written petition (143 signatories) 12/2/2025
        - Act No. 273 of 1970 established the Vermont Pesticide Advisory Council (VPAC) whose mandate was to reduce pesticides in Vermont
        - Pesticide use has increased and includes some PFAS active pesticide ingredients
        - Act No. 49 of 2021 established the Agricultural Innovation Board in replace of VPAC and created 6 V.S.A. §4964 with six legislative charges pertaining to pesticide reduction
        - The Vermont Agriculture & Food System Strategic Plan: Farm to Plate 2021-2030 calls for a 20% reduction in pounds of pesticides used per year by 2030. 2030 is less than five years away.
        - The time is *now* to protect Vermont's land, water, people, wildlife and future generations from economic poisons. Please, support organic, regenerative farming methods *now.*
        - Urge members to commit at the December 8 meeting to a serious effort to fulfill AIB's pesticide reduction mandate in 2026
        - Submitted a list of pesticides from detection results included in Notice of Intent to Sue issued by Conservation Law Foundation (CLF) and Vermont Natural Resources Council (VNRC) to Vorsteveld, LLP

Table 1. Agricultural Innovation Board Legislative Charges / Reporting Requirements as established in 6 VSA § 4964 (a) through (d).

	RESPONSIBILITY / LEGISLATIVE CHARGE
1	Review historic recommendations for pesticide reduction in the State and coordinate with existing work groups to avoid submitting to the General Assembly conflicting policy recommendations on the regulation of pesticides and farming.
2	Recommend practices that reduce the use of and exposure to pesticides and synthetic fertilizers in order to protect soil biology, human health, and environmental health, including recommended targets to achieve the State goal of an overall reduction in the use of pesticides consistent with sound pest or vegetative management practices.
3	Advise the Executive Branch and the General Assembly with respect to legislation concerning the use of agricultural pest control measures and integrated pest management.
4	Recommend to the Secretary of Agriculture, Food and Markets policies, proposed rules, or legislation for the regulation of the use of treated articles when the Board determines that use of a treated article will have a hazardous or long-term deleterious effect on the environment in Vermont, presents a likely risk to human health, or is dangerous. (Note: amended by Act 145, 2022; see Table 2).
5	Recommend practices to reduce the use and generation of waste associated with plastic in farming.
6	Incentivize farming practices that are looking to reduce the use and dependence on pesticides in their practices.
7	Advise the Agency with regard to the regulation of plant biostimulants.
8	Recommend studies necessary for the performance of its functions as established under this section.
9	Explore methods and standards for transitioning farmers to practices that reduce pesticide usage.
10	Explore methods and standards for farmers to engage in carbon sequestration or mitigation.
11	Review the seed traits of a new genetically engineered seed proposed for sale, distribution, or use in the State.
12	Study and issue recommendations regarding the feasibility of the use of biodegradable plastics in agriculture and the promotion of the use of and production of biodegradable plastics and similar products in Vermont.
13	Seed review. The Agricultural Innovation Board shall advise the Secretary regarding the sale, distribution, or use of genetically engineered seed in the State and may recommend to the Secretary limits or conditions on the sale, distribution, or use of a genetically engineered seed or seeds or recommend a limited period of time for sale of a genetically engineered seed or seeds.
	REPORTING
1	Issue a report annually to the General Assembly on or before January 15 that recommends policy solutions to assist farmers in: (A) reducing the use of and exposure to pesticides; and (B) the use of innovative or alternative practices.
2	Propose an annual budget report that provides ideas for funding sources for any new programs recommended in the annual report.
3	Survey farmers from every county in the State to help better understand how agricultural inputs, such as pesticides, synthetic fertilizers, and plastics, are currently used, as well as current challenges farmers face in reducing these inputs in order to better inform recommendations to be provided in the annual report required under subdivision (1) of this subsection.

Table 2. Agricultural Innovation Board Work Planned Focus Areas for CY 2026 (not necessarily in priority order).

Item	Responsibility/Legislative Charge	Informational Needs
1	Consult with Agency of Agriculture, Food & Markets and General Assembly through development and finalization of BMP rule for neonicotinoid treated seeds and neonicotinoid pesticides	
2	Consult with Agency of Agriculture, Food & Markets through development of the pest risk assessment program required for exemption order determinations for the use of neonicotinoid treated seeds after the ban is in effect.	Research results from University of Vermont and Cornell University relevant to determining risk of pest damage prior to planting corn, cereal grains, and soybeans in Vermont. Pest risk assessment frameworks utilized in other governments where neonicotinoid/neonicotinoid treated seeds have been banned.
3	Recommend practices to reduce the use and generation of waste associated with plastic in farming.	Information relevant to agricultural plastic use within state, available alternatives, disposal options, existing recycling/collection programs, and previous research and recommendations. -learn from recycling companies about cleaning processes and market demand/availability -learn from previous pilot agricultural plastic recycling programs offered in Vermont
4	Study and issue recommendations regarding the feasibility of the use of biodegradable plastics in agriculture.	Understanding of definition of biodegradable and information about innovations and academic and industrial research in agriculture regarding plastic alternatives (North America and European Union).
5	Recommend practices that reduce the use of and exposure to pesticides and synthetic fertilizers in order to protect soil biology, human health, pollinators and other beneficials, and environmental health, including recommended practices to achieve the State goal of an overall reduction in the use of pesticides consistent with sound pest or vegetative management practices.	Information and research about agricultural management practices that allow for reduction of pesticide and/or synthetic fertilizer use without compromising agricultural production or economic viability.
6	Advise the Executive Branch and the General Assembly with respect to legislation concerning the use of agricultural pest control measures and integrated pest management.	Legislation concerning the use of agricultural pest control measures and integrated pest management introduced in the 2025/2026 Legislative Session.

7	Recommend studies necessary for the performance of its functions as established under this section.	Studies needed to provide information not currently available to better understand: status of pollinators in VT; effective and available alternatives to neonicotinoids; and, pest risk assessment program development to determine treatments needed on seed.
8	Survey farmers from every county in the State to help better understand how agricultural inputs, such as pesticides, synthetic fertilizers, and plastics, are currently used, as well as current challenges farmers face in reducing these inputs in order to better inform recommendations to be provided in the annual report required under subdivision (1) of this subsection.	Results of the survey of farmers conducted per 6 VSA §4964 (c) 3.
9	Review historic recommendations for pesticide reduction and agricultural waste disposal in the State and coordinate with existing work groups to avoid submitting to the General Assembly conflicting policy recommendations on the regulation of pesticides and farming.	Recommendations from other extant groups evaluating pesticides, agricultural waste, and related issues in Vermont.

Appendix A: Board Members

Wendy Sue Harper, Ph.D. - Soil Biologist, Professor Emeritus, Prescott College, University of Vermont [AIB Role Fulfillment: Soil Biologist]
Appointment concluded February 20, 2025

Shawn Lucas, Ph.D. - Agronomy Specialist, Certified Crop Advisor, Extension Assistant Professor, University of Vermont [AIB Role Fulfillment: Soil Biologist]
Appointment commenced February 20, 2025

Amanda St. Pierre - Dairy Farmer, Pleasant Valley Farms [AIB Role Fulfillment: an active farmer who is a member of an organization representing the conventional dairy industry in Vermont]

Fitzroy Beckford, Ph.D. - Associate Dean and Director of UVM Extension in the College of Agriculture and Life Sciences [AIB Role Fulfillment: a member from the University of Vermont Center for Sustainable Agriculture]
Appointment concluded December 8, 2025

Nathan Nourse – Crop Consultant, blueberry farmer [AIB Role Fulfillment: an active farmer who is a member of an organization representing fruit and vegetable farmers in Vermont]

Jonathan Chamberlin - Ag Retail/Crop Consultant, Bourdeau Brothers [AIB Role Fulfillment: a certified crop consultant]

Abbi Pajak - Environmental Analyst, Department of Environmental Conservation, Agency of Natural Resources [AIB Role Fulfillment: the Secretary of Natural Resources or designee]

Leon Corse – Organic Dairy Farmer, The Corse Farm Dairy [AIB Role Fulfillment: an active farmer who is a member of an organization representing the organic farming community]
Appointment commenced January 27, 2025

Ryan Rebozo, Ph.D. - Director of Conservation Science, Vermont Center for Ecostudies [AIB Role Fulfillment: a member of an environmental organization that advocates for policy regarding the management or reduction of toxic substances in the State]

Steven Schubart - Grass-fed beef operation owner, Grass Cattle Company [AIB Role Fulfillment: an active farmer who is a member of an organization representing grass-based, non-dairy livestock farming in Vermont]
Appointment concluded November 20, 2025

James Hamilton - Grass-fed beef operation owner, Hamilton Cattle Company [AIB Role Fulfillment: an active farmer who is a member of an organization representing grass-based, non-dairy livestock farming in Vermont]
Appointment commenced December 3, 2025

Pamela Wadman - Senior Environmental Health Risk Assessor, Environmental Health Division, Vermont Department of Health [AIB Role Fulfillment: the Commissioner of Health or a designee with expertise in the effects of pesticides on human health]

Laura DiPietro - Director, Water Quality Division, Agency of Agriculture, Food & Markets [AIB Role Fulfillment: the Director of the Agency of Agriculture, Food and Markets, Water Quality Program or designee]

Morgan Griffith - Agrichemical Program Manager, Public Health and Agricultural Resource Management Division, Agency of Agriculture, Food & Markets [AIB Role Fulfillment: the Director of the Agency of Agriculture, Food and Markets, Agrichemical Program or designee]

Steven Dwinell - Director, Public Health and Agricultural Resource Management Division, Agency of Agriculture, Food & Markets [AIB Role Fulfillment: the Secretary of the Agency of Agriculture, Food and Markets or designee]