VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# Agricultural Innovation Board

## 2025 Annual Report

Morgan Griffith, Agrichemical Program Manager
House Committee on Agriculture, Food Resiliency, and Forestry – April 2, 2026

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# PUBLIC MEETINGS

- 6 public meetings in 2025
  - Review of literature and resources
  - Expert witnesses and public comment
  - Publicly accessible Meeting information
- 2025 Annual Report of the Agricultural Innovation Board (AIB)

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# 2024 AGRICULTURAL INPUT SURVEY

- Polled participants of the Agricultural Pesticide Applicators Meeting (March 2024)
  - 55 responses, 10 counties
  - What environmental impacts are of concern when using agricultural inputs? (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
    - Non-target rodenticide exposure
  - What are the challenges to reducing use of ag inputs that cause environmental concern? (listed in order of most selected to least selected by participants)
    - Effectiveness of alternatives
    - Availability of alternatives
    - Cost of alternatives
    - Knowledge of alternatives

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# 2025 AGRICULTURAL INPUT SURVEY

- Same questions included in survey disseminated by the UVM Entomology Research Lab to regional high tunnel growers in the Northeast (Nov. 2024-Apr. 2025)
  - 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%, 7 counties)
  - VT responses followed same trends as other Northeast states
  - What environmental impacts are of concern when using agricultural inputs? (listed in order of most selected to least selected by participants)
    - Disposal of farm materials that are no longer useful (tires, ag plastic, pesticides, etc.)
    - Microplastics
    - PFAS
    - Non-target pollinator exposure
    - Non-target rodenticide exposure
    - Other: “Introduction of new weeds/pests from incorporating off-farm inputs”
  - What are the challenges to reducing use of ag inputs that cause environmental concern? (listed in order of most selected to least selected by participants)
    - Availability of alternatives
    - Lack of knowledge of alternatives
    - Use of alternatives is inconvenient
    - Effectiveness of alternatives
    - Cost of alternatives
    - Other: “I limit and reuse as much as possible”

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# 2025 AGRICULTURAL INPUT SURVEY

- AIB members understand survey results do not fully encompass all areas of concern or reflect the issues of most importance to Vermont farmers
- Significant challenges faced by VT farmers – highlighted by 2025 historic drought
- AIB continually revising the survey strategy
  - Increase participation
  - Gather relevant information
  - Assess issues of importance and significant impact to VT farmers

# WORK OF THE BOARD

- Began to address concern of farmers about the environmental impact of agricultural waste (tires, plastic) identified by survey participants
  - Expert Witnesses: AAFM, DEC, recycling industry, Canadian producer responsibility organizations, CRWFA, dairy cooperatives, producers of compostable plastic
- Consulted with AAFM during rulemaking process for Best Management Practices for Use of Neonicotinoid Treated Article Seeds and Neonicotinoid Pesticides

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# WORK OF THE BOARD – AG PLASTIC

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.*

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# AG PLASTIC RELEVANT INFO

- Crop production
  - Plastic mulch
  - Irrigation tubing
  - Hoop house
  - Row cover
  - Fruit crop netting
  - Trellising ties/clips
- Livestock
  - Bale wrap (estimated 2,775 tons used annually)
  - Bunker cover (estimated 500 tons used annually)
  - Bale twine/netting
  - Hoof blocks
  - Silage tubes/bags
  - Feed bags
- Nursery
  - Plastic mulch
  - Nursery pots / plug trays
  - Irrigation tubing
  - Greenhouse plastic
- Other ag industries
  - Maple tubing (estimated 390 tons annually)
  - Pesticide containers
  - Seed and fertilizer bags
  - Pellet bags
  - Apiary supplies

Preliminary investigation into agricultural plastics – AAFM/Agricultural Plastics Workgroup, 2020

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# AG PLASTIC RELEVANT INFO

- Where does it go?
  - Landfill (primarily)
  - Sterilized and reused
  - Recycled
  - Illegally burned or buried
  - Stored/not managed

Preliminary investigation into agricultural plastics – AAFM/Agricultural Plastics Workgroup, 2020

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# AG PLASTIC RELEVANT INFO

- What does it cost?
  - Estimated cost of disposal in a landfill is $125/ton or $0.065/lb (2019 estimate)
  - Annual estimate in 2021 of disposal of ag plastic in a landfill is 3,590 tons
  - Landfill costs to farmers are estimated at $500,000 per year (2019 estimate)

Preliminary investigation into agricultural plastics – AAFM/Agricultural Plastics Workgroup, 2020

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# AG PLASTIC RELEVANT INFO

- Challenges identified in AAFM Agricultural Plastics Workgroup preliminary investigation
  - Recycling infrastructure is sparse
  - Logistical barriers for producers (lack of storage, cleaning)
  - Transportation logistics
  - Limited market demand for different types of recycled plastics
  - Alternatives to plastic

Preliminary investigation into agricultural plastics – AAFM/Agricultural Plastics Workgroup, 2020

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# AG PLASTIC RECYCLING – PAST & PRESENT

- Historic pilot recycling programs
  - Casella and Agrimark/Cabot Creamery Cooperative, 2014
  - Northeast Waste Management Officials Association, 2008-2009
  - NY Recycling Ag Plastics Project, ceased operation in 2016
- Current recycling programs
  - Maine Organic Farmers and Gardeners Association (LDPE #4 clear & white film (i.e. greenhouses, high tunnel)
  - Connecticut River Watershed Farmers Alliance (bale wrap)
  - Agricultural Container Recycling Council (ACRC)
    - RPM Eco, Canadian-based recycling company, largest collector and recycler of contaminated empty plastic containers
    - Early estimates 5,000lbs plastic collected in VT
    - End products: oil containers, five-gallon buckets, garbage carts
  - Vermont Nursery and Landscape Association & Prides Corner Farm (plastic pots)

# AG PLASTIC RECYCLING – PAST & PRESENT

- Connecticut River Watershed Farmers Alliance (bale wrap)
  - Received Working Lands Grant
  - CRWFA members ($50) given super-sack totes for collecting clean, dry bale wrap
  - CRWFA picks up filled totes and brings to solid waste districts in Brattleboro, Lyndonville, and Lebanon, NH to compact into bales.
  - Once full truckload of compacted bales is available, CRWFA transports to recycling processing company in PA
  - Program Objectives
    - Improve economic viability
    - Evaluate carbon footprint

# AG PLASTIC RECYCLING – PAST & PRESENT

- Organic Valley Cooperative Wisconsin ag plastic recycling pilot program, 2009-2021
  - Vegetable plastic mulch 9-year recycling program: 110 vegetable farms in SW WI + 10 dumpster locations + 260 tons plastic collected & recycled = $44,000 total cost
    - Farms self funding the program currently
  - 2012 study of dairy ag plastic estimated 264,000lbs plastic per year on OV dairy farms
    - 8-15lbs per cow per year
  - Revolution Plastics provides free dumpsters and pickup for agricultural film plastic in Midwest
    - Farmers responsible for keeping plastics as clean as possible, but recycling companies may have developed mechanical washing systems
  - Challenges of ag plastic recycling programs
    - High cost (transportation, cleaning, processing)
    - Contamination (ag plastics are usually dirty, cleaning is difficult and resource & labor intensive)
    - Collection logistics (time consuming, rural areas add complexity)
    - High volumes (large volume and weight of ag plastic are hard to manage efficiently)
    - Limited alternatives (biodegradable materials don’t perform as well, slow adoption)

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# AG PLASTIC – EPR PROGRAMS

- VT currently has 5 Extended Producer Responsibility (EPR) laws designed to provide free, convenient recycling options through partnerships with retailers
  - Electronics
  - Mercury thermostats
    - $5 rebate, participation declined since fewer in homes
  - Paint
    - Advanced consumer fee (“eco-fee”) established in VT Statute
    - Paint Care Program responsible for finances and collections
    - Never surplus budget, always collecting more paint than what has been sold with fee paid
  - Mercury-containing light bulbs
  - Batteries
- VT passed nation’s first Household Hazardous Waste EPR law in 2025
  - 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
- All existing EPR programs correlate with landfill bans (target toxic and hard to manage materials) ensuring that bans are paired with viable recycling solutions
  - Waste tires banned from landfills in 1992 Act 78, VT one of 14 states without formal scrap tire management program
  - Tire EPR legislation introduced (2015, 2017, 2024, 2025) aimed to shift burden of tire disposal from consumer to manufacturers

# AG PLASTIC – EPR PROGRAMS

- Ag plastic EPR regulations in Canada differ by province: Manitoba in 2011, Saskatchewan in 2018, Prince Edward Island and Quebec in 2022-2023
- Quebec's EPR regulations include bale wrap, silage bags, pesticide containers, greenhouse plastics, and maple tubing
  - Producers required to develop and finance government-approved programs
    - Programs are funded through eco-fees (7-10% of product cost for hay/silage related products lower for pesticides)
  - Difficult for producers to build an efficient program on their own that meets complex criteria of the regulations
  - Utilize Cleanfarms, a national Producer Responsibility Organization (PRO)

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# AG PLASTIC – EPR PROGRAMS

- Key lessons from Cleanfarms in developing EPR regulations
  - Involve producers early in policy development
  - Conduct agricultural waste studies to quantify plastic volumes
  - Identify viable collection sites and recyclers
  - Pilot programs to test regional feasibility
  - Significant investment (development time & costs often higher than anticipated)
  - At least 2 year implementation window
  - Enforcement is challenging and without broad producer participation programs struggle financially
  - Long-term, sustainable success depends on sustained investment, scalable infrastructure, and strong collaboration among regulators, producers, and recycling organizations

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# AG PLASTIC – PRO

- Cleanfarms: Canadian Producer Responsibility Organization (PRO)
- 1989 pesticide container recycling initiative – expanded scope (obsolete medicines, fertilizer containers, seed bags, grain bags, twine, silage film, maple tubing)
- Recovery rates ranging 33%-81% depending on material and region BUT only 16% total ag plastics collected
  - Early-stage development of EPR legislation for ag plastics that Cleanfarms depends on to fund the collection programs
- Operates 2,300+ collection sites nationwide
- Contract with recycling industry partners who repurpose into new products (ag drainage tiles, fence posts, pallets, curb stops)
- Farmer cooperation is strong significant challenge to clean waste like seed bags and bale wrap
  - Educational campaigns & Industry guidance to address dust control and proper disposal of treated seed bags (currently energy-from-waste facilities)

# AG PLASTIC – PRO

- Cleanfarms Key Considerations
  - Keep costs as low as possible through operational efficiencies
  - Collect fee from manufacturers to then keep cost to farmers as low as possible
  - Farmers want to do the right thing, build convenient, accessible programs so they participate
  - Work closely with regulators on EPR, since ag plastic is different it is not easy to find end market contractors to recycle it
    - Ag plastic regulations should not be combined with consumer goods policy – developed with rural landscapes and products in mind

# AG PLASTIC – BIODEGRADABLE ALTERNATIVES

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

- Nature's Net Wrap Western Canadian business developed plant-based certified compostable alternative net wrap
  - Maintains durability for 12+ months and compatible with existing baling equipment
- Important difference between "compostable" and "biodegradable"
  - Not everything that is biodegradable is compostable
- $1.50-$1.75 per bale premium over traditional plastic net wrap
  - Cost offset by reduced labor, equipment damage, disposal expenses
  - Aim to decrease cost as business grows and scales production
- Main challenge is awareness and adoption

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# AG PLASTIC – PRELIMINARY RECOMMENDATIONS

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.*

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# AG PLASTIC – PRELIMINARY RECOMMENDATIONS

- When developing legislative policy relevant to agricultural plastic extended producer responsibility (EPR) programs, the following are important considerations:
  - Involve producers early in the policy development
  - Conduct agricultural waste studies to quantify plastic volumes
  - Implement pilot programs to test regional feasibility
- Legislative Policies implementing EPR 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

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# AG PLASTIC – PRELIMINARY RECOMMENDATIONS

- Without broad producer participation, EPR programs face financial strain – Enforcement is important
  - 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
- The model of a Producer Responsibility Organization (PRO) (i.e. Cleanfarms in Canada) facilitating the EPR regulations and requirements for producers is a proven successful policy option
  - 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

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# AG PLASTIC – PRELIMINARY RECOMMENDATIONS

- Agricultural plastic recycling programs are an alternative option to EPR and state regulations
  - Identifying an end market for the plastic waste to be recycled is essential for a sustainable ag plastic recycling program
    - Potential for recent recycled plastic content requirements could drive market for recycled plastics, increasing demand, because more recycling companies will be accepting plastic waste
  - Important to continue to learn from past pilot programs within VT to understand local challenges and changes necessary to become sustainable
- The dichotomy of needing a long-term barrier for quality feed production and needing a material that breaks down in the environment is challenging
  - AAFM should support research efforts in viable compostable/biodegradable alternatives to ag plastic
  - Current organic farming standards limit adoption of biodegradable plastics as they are considered soil amendments and therefore must meet those criteria
  - There is a need for clarification and education about the difference between biodegradable plastics and compostable plastics

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# ADDITIONAL TOPICS

- Rulemaking process for Neonicotinoid Treated Article Seeds and Neonicotinoid Pesticides Best Management Practices
- Neonicotinoid research at UVM
- Wild pollinators and established crop systems research by Vermont Center for Ecostudies
- AAFM Apiary program
- Informed of policy discussions and legislative actions concerning perfluoroalkyl and polyfluoroalkyl substances

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# 2026 WORK PLAN

- Support rulemaking process as needed for neonic BMPs
- Consult with AAFM as the pest risk assessment process is developed
- Learn more about ag plastic alternatives, recycling industry, and recycling programs to make an informed final recommendation
- Learn about practices that may reduce use of and dependence on pesticides in VT while remaining consistent with sound pest or vegetative management practices

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# MEMBERS

- **Wendy Sue Harper** - Ph.D. Soil Biologist, Associate Faculty, Prescott College [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 producer [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

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

# MEMBERS

- **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, Department of Health, Agency of Human Services [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, Division of Plant Industry, 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, Division of Plant Industry, Agency of Agriculture, Food & Markets [AIB Role Fulfillment: the Secretary of the Agency of Agriculture, Food and Markets or designee]