New Hampshire
Department of Agriculture, Markets, and Food

Shawn N. Jasper, Commissioner

41

April 29, 2025

Her Excellency, Governor Kelly A. Ayotte
and the Honorable Council
State House
Concord, New Hampshire 03301

REQUESTED ACTION

Authorize the New Hampshire Department of Agriculture, Markets & Food to **retroactively** amend a Cooperative Project Agreement with the University of New Hampshire Office of Sponsored Research, VC #315187 B083, for the *2024 IPM Program for Fruit and Vegetable Crops On-Farm Monitoring* by extending the completion date from March 31, 2025 to September 30, 2025, with no change to the price limitation of $69,416, effective upon Governor and Council approval. The original grant was approved by the Governor and Council on March 27, 2024, item #37. 100% Other Funds (Integrated Pest Management Fees).

EXPLANATION

The *2024 IPM Program for Fruit and Vegetable Crops On-Farm Monitoring* expired on March 31, 2025. We are requesting approval of this amendment to the agreement in order to provide the University of New Hampshire, Office of Sponsored Research additional time to complete the agreed upon scope of services. The extension of the grant completion date is necessary to allow the University of New Hampshire, Office of Sponsored Research to complete the necessary due diligence for the project. Based on information from University of New Hampshire Office of Sponsored Research, the Department of Agriculture, Markets & Food is confident that the project will be completed.

This item is **retroactive** because the required documentation was not completed prior to the contract expiration date of March 31, 2025.

Respectfully Submitted,

Shawn N. Jasper
Commissioner

AMENDMENT #01 to
COOPERATIVE PROJECT AGREEMENT
between the
STATE OF NEW HAMPSHIRE, **Department of Agriculture, Markets, & Food**
and the
University of New Hampshire of the UNIVERSITY SYSTEM OF NEW HAMPSHIRE

The Cooperative Project Agreement, approved by the State of New Hampshire Governor and Executive Council on **3/27/24**, item # **37**, for the Project titled "**2024 IPM Program for Fruit and Vegetable Crops On-Farm Monitoring**," Campus Project Director, **Amber Vinchesi-Vahl**, is and all subsequent properly approved amendments are hereby modified by mutual consent of both parties for the reason(s) described below:

Purpose of Amendment (Choose all applicable items):

☒ Extend the Project Agreement and Project Period end date, at no additional cost to the State.

☐ Provide additional funding from the State for expansion of the Scope of Work under the Cooperative Project Agreement.

☐ Other:

Therefore, the Cooperative Project Agreement is and/or its subsequent properly approved amendments are amended as follows (Complete only the applicable items):

- Article A. is revised to replace the State Department name of with and/or USNH campus from to .
- Article B. is revised to replace the Project End Date of **3/31/25** with the revised Project End Date of **9/30/2025**, and Exhibit A, article B is revised to replace the Project Period of **Upon Governor and Council Approval – March 31, 2025** with **Upon Governor and Council Approval – September 30, 2025**.
- Article C. is amended to expand Exhibit A by including the proposal titled, " ," dated .
- Article D. is amended to change the State Project Administrator to and/or the Campus Project Administrator to .
- Article E. is amended to change the State Project Director to and/or the Campus Project Director to .
- Article F. is amended to add funds in the amount of S and will read:

  Total State funds in the amount of S have been allotted and are available for payment of allowable costs incurred under this Project Agreement. State will not reimburse Campus for costs exceeding the amount specified in this paragraph.

- Article F. is amended to change the cost share requirement and will read:

  Campus will cost-share % of total costs during the amended term of this Project Agreement.

- Article F. is amended to change the source of Federal funds paid to Campus and will read:

  Federal funds paid to Campus under this Project Agreement as amended are from Grant/Contract/Cooperative Agreement No. from under CFDA# . Federal regulations required to be passed through to Campus as part of this Project Agreement, and in

Campus Authorized Official *DH*
Date 3/25/25

accordance with the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002, are attached to this document as **revised** Exhibit B, the content of which is incorporated herein as a part of this Project Agreement.

- Article G. is exercised to amend Article(s) of the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002, as follows:

  Article is amended in its entirety to read as follows:
  Article is amended in its entirety to read as follows:

- Article H. is amended such that:

  ☐ State has chosen **not to take** possession of equipment purchased under this Project Agreement.
  ☐ State has chosen **to take** possession of equipment purchased under this Project Agreement and will issue instructions for the disposition of such equipment within 90 days of the Project Agreement's end-date. Any expenses incurred by Campus in carrying out State's requested disposition will be fully reimbursed by State.

- ☐ Exhibit A is amended as attached.

- ☐ Exhibit B is amended as attached.

All other terms and conditions of the Cooperative Project Agreement remain unchanged.

This Amendment, all previous Amendments, the Cooperative Project Agreement, and the Master Agreement constitute the entire agreement between State and Campus regarding the Cooperative Project Agreement, and supersede and replace any previously existing arrangements, oral and written; further changes herein must be made by written amendment and executed for the parties by their authorized officials.

This Amendment and all obligations of the parties hereunder shall become effective on the date the Governor and Executive Council of the State of New Hampshire or other authorized officials approve this Amendment to the Cooperative Project Agreement.

IN WITNESS WHEREOF, the following parties agree to this **Amendment #01** to the Cooperative Project Agreement.

By An Authorized Official of:
University of New Hampshire

Name: Dianne Hall
Title: Manager, Pre-Award Compliance
Signature and Date: Dianne Hall Digitally signed by Dianne Hall Date: 2025.03.25 09:27:32 -04'00'

By An Authorized Official of:
Department of Agriculture, Markets & Food

Name: Shawn N. Jasper
Title: Commissioner
Signature and Date: Shawn N Jasper 3/25/25

By An Authorized Official of: the New Hampshire Office of the Attorney General

Name: Louise D. Williams
Title: Assistant Attorney General
Signature and Date: 4/29/25

By An Authorized Official of: the New Hampshire Governor & Executive Council

Name:
Title:
Signature and Date:

Campus Authorized Official *DH*
Date 3/25/25

New Hampshire
Department of Agriculture, Markets & Food

Shawn N. Jasper, Commissioner

37

February 21, 2024

His Excellency, Governor Christopher T. Sununu
and the Honorable Council
State House
Concord, New Hampshire 03301

REQUESTED ACTION

Authorize the New Hampshire Department of Agriculture, Markets & Food, Division of Pesticide Control to enter into a Cooperative Project Agreement, in the amount of $69,416, with the University of New Hampshire, Office of Sponsored Research, VC #315187 B083, for the advancement of agricultural research and to assist in the promotion of Integrated Pest Management practices in New Hampshire, effective upon Governor and Council approval through March 31, 2025. 100% Other Funds.

Funding is available as follows:

02-18-18-183010-21820000, Integrated Pest Management

	FY 2024
075-500590 - Grants and Subsidies	$69,416

EXPLANATION

The New Hampshire Department of Agriculture, Markets and Food (NHDAMF), Division of Pesticide Control in fulfilling its responsibilities under the Integrated Pest Management (IPM) Program, RSA 430:50; to promote the principles of IPM and assist New Hampshire citizens to advance the practice of such principles, has reviewed the project, "*2024 IPM Program for Fruit and Vegetable Crops On-Farm Monitoring*", and finds it exemplifies good practices associated with Integrated Pest Management. The research and educational aspects associated with this project and the efforts of the University of New Hampshire Cooperative Extension identify and establish the presence and treatment methods for pests common to sweet corn and vine crops. Experience and results of this project serve the benefit of all citizens of New Hampshire. The attachment includes a summary of the project and the dollar amount associated with each component.

Respectfully submitted,

Shawn N. Jasper
Commissioner

Office of Commissioner 25 Capitol Street PO Box 2042 Concord, NH 03302-2042
www.agriculture.nh.gov/divisions (603) 271-3551 Fax: (603) 271-1109
TDD Access: Relay NH 1-800-735-2964

COOPERATIVE PROJECT AGREEMENT

between the

STATE OF NEW HAMPSHIRE, Department of Agriculture, Markets & Food

and the

University of New Hampshire of the UNIVERSITY SYSTEM OF NEW HAMPSHIRE

A. This Cooperative Project Agreement (hereinafter "Project Agreement") is entered into by the State of New Hampshire, Department of Agriculture, Markets & Food, (hereinafter "State"), and the University System of New Hampshire, acting through University of New Hampshire, (hereinafter "Campus"), for the purpose of undertaking a project of mutual interest. This Cooperative Project shall be carried out under the terms and conditions of the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002, except as may be modified herein.

B. This Project Agreement and all obligations of the parties hereunder shall become effective on the date the Governor and Executive Council of the State of New Hampshire approve this Project Agreement ("Effective date") and shall end on 3/31/25. If the provision of services by Campus precedes the Effective date, all services performed by Campus shall be performed at the sole risk of Campus and in the event that this Project Agreement does not become effective, State shall be under no obligation to pay Campus for costs incurred or services performed; however, if this Project Agreement becomes effective, all costs incurred prior to the Effective date that would otherwise be allowable shall be paid under the terms of this Project Agreement.

C. The work to be performed under the terms of this Project Agreement is described in the proposal identified below and attached to this document as Exhibit A, the content of which is incorporated herein as a part of this Project Agreement.

Project Title: **2024 IPM Program for Fruit and Vegetable Crops On-Farm Monitoring**

D. The Following Individuals are designated as Project Administrators. These Project Administrators shall be responsible for the business aspects of this Project Agreement and all invoices, payments, project amendments and related correspondence shall be directed to the individuals so designated.

State Project Administrator

Name: Rebecca L. Tgibedes
Address: State House Annex
25 Capitol Street
P.O. Box 2042
Concord, NH 03301
Phone: 603 271-7788

Campus Project Administrator

Name: Dianne Hall
Address: University of New Hampshire
Sponsored Programs Administration
51 College Road
Durham, NH 03824
Phone: 603 862-1992

E. The Following Individuals are designated as Project Directors. These Project Directors shall be responsible for the technical leadership and conduct of the project. All progress reports, completion reports and related correspondence shall be directed to the individuals so designated.

State Project Director

Name: David J. Rousseau
Address: State House Annex
25 Capitol Street
P.O. Box 2042
Concord, NH 03301
Phone: 603 271-3640

Campus Project Director

Name: Amber Vinchesi-Vahl
Address: UNH Cooperative Extension
Kendall Hall
129 Main Street
Durham, NH 03824
Phone: 603 696-3312

Campus Authorized Official KJ
Date 2/20/24

F. Total State funds in the amount of $69,416 have been allotted and are available for payment of allowable costs incurred under this Project Agreement. State will not reimburse Campus for costs exceeding the amount specified in this paragraph.

Check if applicable
☐ Campus will cost-share % of total costs during the term of this Project Agreement.

☐ Federal funds paid to Campus under this Project Agreement are from Grant/Contract/Cooperative Agreement No. from under CFDA# . Federal regulations required to be passed through to Campus as part of this Project Agreement, and in accordance with the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002, are attached to this document as Exhibit B, the content of which is incorporated herein as a part of this Project Agreement.

G. Check if applicable
☐ Article(s) of the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002 is/are hereby amended to read:

H. ☒ State has chosen not to take possession of equipment purchased under this Project Agreement.
☐ State has chosen to take possession of equipment purchased under this Project Agreement and will issue instructions for the disposition of such equipment within 90 days of the Project Agreement's end-date. Any expenses incurred by Campus in carrying out State's requested disposition will be fully reimbursed by State.

This Project Agreement and the Master Agreement constitute the entire agreement between State and Campus regarding this Cooperative Project, and supersede and replace any previously existing arrangements, oral or written; all changes herein must be made by written amendment and executed for the parties by their authorized officials.

IN WITNESS WHEREOF, the University System of New Hampshire, acting through the **University of New Hampshire** and the State of New Hampshire, **Department of Agriculture, Markets & Food** have executed this Project Agreement.

By An Authorized Official of:
University of New Hampshire

Name: Karen M. Jensen
Title: Director, Pre-Award Compliance
Signature and Date: Karen Jensen Digitally signed by Karen Jensen Date: 2024.03.30 14:46:23 -05'00'

By An Authorized Official of:
Department of Agriculture, Markets & Food

Name: Shawn N. Jasper
Title: Commissioner
Signature and Date: 2/23/24

By An Authorized Official of: the New Hampshire Office of the Attorney General

Name: Sheri L. Phillips
Title: Assistant Attorney General
Signature and Date: Sheri Phillips 3/12/2024

By An Authorized Official of: the New Hampshire Governor & Executive Council

Name:
Title:
Signature and Date:

Campus Authorized Official KJ
Date 2/20/24

EXHIBIT A

A. **Project Title:** 2024 IPM Program for Fruit and Vegetable Crops On-Farm Monitoring

B. **Project Period:** Upon Governor and Council Approval through March 31, 2025

C. **Objectives:** The objectives of the University of New Hampshire are to assist the Department of Agriculture, Markets & Food in the promotion and advancement of Integrated Pest Management in New Hampshire

D. **Scope of Work:** A detailed scope of work is on file with the Department of Agriculture, Markets & Food and described in Attachment A of this agreement.

E. **Deliverables Schedule:** A detailed description with schedule for each project is on file with the Department of Agriculture, Markets & Food and described in Attachment A of this agreement.

Major Project Components:

On Farm Monitoring: April 2024 through October 2024
Insect/Crop: Corn Earworms/sweet corn
Fall Armyworm/sweet corn
European Corn Borer/sweet corn
Western Bean Cut Worm/sweet corn
Squash Vine Borer/vine crops
Brown Marmorated Stink Bug/fruit and vegetables
Spotted Wing Drosophila/fruit

Final Report: February 1, 2025

F. **Budget and Invoicing Instructions:** Campus will submit an invoice on regular Campus invoice form for $69,416 at the time of Governor and Council approval. State will pay Campus within 30 days of receipt of the invoice. Any unused funds must be returned to the State after the project end date.

Budget Items	State Funding	Cost Sharing (if required)	Total
1. Salaries & Wages	$36,781	0	$36,781
2. Employee Fringe Benefits	6,601	0	6,601
3. Travel	8,710	0	8,710
4. Supplies and Services	3,000	0	3,000
5. Facilities & Admin. Costs	14,324	0	14,324
Subtotals		0	$69,416
In Kind Contribution		0	0
Total Project Costs			$69,416

G. Other

Campus Authorized Official KJ
Date 2/20/24

A representative of the Department of Agriculture, Markets & Foods reserves the right to attend seminars and audit any work performed by the grant recipient.

Attachment A: Project Proposal - "2024 IPM Program for Fruit and Vegetable Crops On-Farm Monitoring"

I. Itemized Budget
Funding can only be used for items detailed in your budget. Requests for the purchase of non-consumable equipment that may serve a broader purpose than the IPM project will be rejected. Itemized budget must be specific.

Expense Account	TOTAL
Personnel	
Extension State Specialist	$14,781
Additional Labor	
110 days @ 8 hours/day@ $25.00/hr.	$ 22,000
Benefits	$ 6,601
Mileage: 100 miles/day @ 130 days @ $0.67/mile	$ 8,710
Supplies	$ 3,000
Subtotal:	$ 55,092
Indirect Costs at 26%	$14,324
Total	$69,416

Personnel: $36,781

A UNH CE - Extension Field Specialist, (0.18 FTE, or 2.1 months) is usually the primary person conducting the project, however, due to the vacancy in the position as of March 2024, Amber Vinchesi-Vahl, UNHCE State Specialist (Entomology and IPM) will be managing the grant (0.18 FTE, 2 months). Part of the State Specialist duties will be to assist with the implementation of this grant. For 2024, all recommendations that are given to the farmers will be approved through the primary person conducting the project (A. Vinchesi-Vahl) and may be delivered through the IPM scout hired for the project. Amber Vinchesi-Vahl will also make follow-up farm visits when necessary during the growing season.

Additional Labor:

IPM Scout for Insect Monitoring and Scouting

One IPM Scout will be hired for insect monitoring and scouting from April through November for various fruit and vegetable insect pests; 110 days for the IPM scout. The IPM scout, with participating growers/farmers/orchardists, will set-up traps, check the traps and monitor the crop weekly to record and collect data throughout the growing season. The scout will collect the traps at the end of the season, clean and inventory the good traps and dispose of the traps that are no longer usable. The scout will also administer and collect the end of season grower/farmer/orchardist surveys.

Benefits Rate(s): $6,601

The University's fringe benefit rates are charged according to our federally negotiated

Campus Authorized Official KJ
Date 2/20/24

rate agreement. The current applicable rates are 33.2% for full fringe benefits, and 7.7% for partial fringe benefits. The "partial fringe" rate applies to non-student hourly wages, faculty summer salaries and other exceptions to contract pay, and FICA-eligible graduate student pay (i.e., summer stipends). The "full fringe" rate applies to all other benefitseligible wages. (College work study wages and graduate student academic year stipends are not benefits-eligible.)

Travel: $8,710

Over the previous years, the IPM scout averaged approximately 100 miles per day conducting the weekly farm visits for checking traps and monitoring crops. The total mileage is based on 100 days additional labor (IPM Scout) and 30 days for UNH CE Extension Field Specialists and/or UNH CE State Specialist, Amber Vinchesi-Vahl.

Mileage and per diem expenses will be reimbursed at the current federal rates. Travel expenses will include in-state travel to farms participating in the IPM program and attending planning sessions and events/meetings/workshops related to this IPM program.

Supplies & Services: $3,000

This application is requesting $3,000 for the purchase of project supplies/services related to the support of this project. Funds will be used for purchasing traps (projected at $1900), trap supplies (i.e., cups, tops, wires, fasteners, etc.), attractants/lures (projected at $1000) and paper, ink, ink cartridges, and printing for forms used by the IPM scout and the PI (Principal Investigator) (projected at $100).

Facilities and Administrative Costs Rate: $14,324

Facilities & Administrative (indirect) costs are calculated according to UNH's current negotiated rate agreement. The applicable rate, as shown on our federal agreement is 26%. The US Department of Health and Human Services is UNH's cognizant federal agency.

II. Project Description (3 lines or less, to be used for publicity purposes):

Selected insect pests of fruit and vegetables will be trapped and monitored on a minimum of fifteen (15) farms weekly through the summer of 2024, plus work with five (5) additional selfreporting farms to provide traps and lures and check in weekly via email or text message on trap catch numbers and to give recommendations.

III. Project Objectives (be sure to include how this project serves the concepts of IPM):

Sweet corn
- Monitoring European corn borer (ECB), corn earworm (CEW), fall armyworm (FAW), and western bean cutworm (WBC) with pheromone traps to determine need, frequency, and timing for insecticide control applications.

- Reduce damage caused to sweet corn by ECB, CEW, FAW, and WBC by application of properly-timed insecticide applications.

Campus Authorized Official KJ
Date 2/20/24

Vine crops

• Determine when squash vine borer (SVB) is active on vegetable farms in New Hampshire.

• Work with vegetable farms on monitoring squash vine borer using Heliothis traps with the SVB lure to determine need, frequency, and timing for insecticide applications.

• Reduce damage caused to cucurbit crops, including pumpkins, summer squash and winter squash, by squash vine borer through application of properly timed insecticide applications.

• Provide timely data to growers to better utilize cultural control methods, such as exclusion fabrics (row covers) for managing SVB.

Brown Marmorated Stink Bug (BMSB)

• Sentinel trapping/monitoring will be conducted for BMSB on a minimum of five (5) vegetable, small fruit and/or tree fruit farms weekly through the summer of 2024.

• Monitor for BMSB using 4-foot-tall pyramid trap with an attractant lure and/or sticky trap with an attractant lure on fruit and vegetable farms.

• Determine if BMSB is feeding on fruits and vegetables in New Hampshire.

• BMSB population data will yield information on seasonal activity and relative abundance of this pest insect, which is necessary for development of an IPM strategy.

Spotted Wing Drosophila (SWD)

• Sentinel trapping/monitored will be conducted for SWD on a minimum of five (5) small fruit farms weekly through the summer of 2024.

• The data will yield information on seasonal activity and relative abundance of Spotted Wing Drosophila, which is needed to determine an IPM control strategy if Spotted Wing Drosophila numbers are over the action threshold of one male fly and becomes a threat to New Hampshire small fruit and tree fruit farms.

IV. Economic and Environmental Impact

Sweet Corn

In 2023, 23 growers participated in the sweet corn insect pest IPM program. The IPM trapping program proved that catches vary widely by site. Twenty-three farms had 26 sets of European corn borer (ECB) traps, including one trap for each of the two strains of ECB. Twenty-three farmers had 29 corn earworm (CEW) traps. Twenty-three farmers had 27 fall armyworm (FAW) traps. Eighteen farmers had twenty western bean cutworm (WBCW) traps.

The participating growers in the IPM program planted 603.4 acres of sweet corn and harvested 477.5 acres (79% of the planted acreage). Comparing the acreage planted and harvested to the 2022 USDA NASS statistics data, the participating farms in the IPM program represented 59% of the sweet corn acreage planted and harvested in the state of New Hampshire.

Growers using the IPM program sprayed 2.04 fewer sprays than they did prior to the current IPM program. Fewer insecticide applications mean lower exposure risk to the applicators and farm workers. This saving was a value of $22,134 for pesticides and $30,741 for labor and equipment costs. The reduction in sweet corn cull rate (throwing away insect-damaged ears) due to the IPM program (as reported by the participating growers) resulted in an increase of $187,745. Growers stated that by using the IPM practices and monitoring for insect pests with traps, they had a 5.28% cull rate for insect damage (sweet corn that could not be sold). Prior to the IPM program, the average cull rate was 13.68%. This means that the growers had a net increase of 8.4% in sweet corn available for sale due to participation in the IPM program. Total sweet corn monetary impact: $240,620. (Based on $5.53/dozen – 2022 NASS)

We anticipate there could be positive impacts from our sweet corn work on chrysanthemum and pepper crops. European corn borer also feeds on these crops, and our monitoring and reporting alerts these growers as well. To avoid fatiguing clientele with questionnaires, we have not measured this impact, but several growers have reported their crops have avoided significant injury because of our notifications.

A newer survey question was added to our 2022 season year-end evaluation, and we asked growers how they grow sweet corn regarding tillage practices. This question was asked during the 2023 evaluations as well. The options were conventional tillage (plowed and harrowed ground), reduced tillage, or no till. Thirty-nine percent of responding growers reported that they employed no-till or reduced tillage practices. Corn residues that are not incorporated into the soil or destroyed can encourage European corn borer overwintering. For the 2024 season, we will encourage growers to thoroughly incorporate residues using best management practices that will help reduce ECB populations by eliminating suitable overwintering habitat.

Vine Crops

In past years, participating growers reported the vine crop IPM work saved them $5,000 on insecticides to control the squash vine borer. We have not been able to measure reduction in crop losses from the squash vine borer work and neither have the growers, but observation indicates it is effective, especially on bush-type crops of Cucurbita pepo or Cucurbita maxima.

In 2023, squash vine borer trap numbers indicated the moths started flying when we would normally expect. Forty-seven percent of participating growers reported they sprayed less due to the IPM program. Growers saved an average of 3.00 sprays across 232.39 acres of summer squash, winter squash, and pumpkins. Fewer insecticide applications mean lower exposure risk to the applicators and farm workers. Growers noted no plant loss due to squash vine borer in 2023. These savings equaled 174 gallons of pesticides that were not applied, saving $10,441 in pesticide expense, and $17,401 for labor and equipment costs. Total cost saving due to the SVB program for the 2023 season was $27,842.

Brown Marmorated Stinkbug (BMSB)

The brown marmorated stinkbug (BMSB), Halyomorpha halys, is an invasive stinkbug native to Japan, Korea, China, and Taiwan, which is now well established throughout the mid-Atlantic region of the United States.

BMSB is a polyphagous species, meaning it can feed on a wide range of hosts; therefore, BMSB

has the potential to be a pest of many crops where it has established. Host crops include tree fruit, vegetables, shade trees, and leguminous crops. In 2010, populations of this invasive species increased dramatically, causing widespread injury to many crops throughout the mid-Atlantic region. Tree fruit was most affected, with some growers losing entire crops of stone fruit. Among apple growers, losses totaled more than $37 million in the region. In several Mid-Atlantic States, BMSB is now the costliest pest for peach and apple growers to manage.

Within the United States, native stinkbugs have been classified as secondary pests of tree fruit and have been successfully managed with broad-spectrum insecticide applications typically directed at other key pests. When BMSB populations increased dramatically, this led to devastating levels of fruit injury and BMSB quickly replaced pests such as codling moth and oriental fruit moth as the key pest driving management decisions in the mid-Atlantic region of the United States. Because BMSB is a newly established invasive species, management programs for this pest are still being developed.

From 2014 through 2020, damage was documented on fruit and vegetable farms in New York, Massachusetts and Connecticut. BMSB was not known to have caused any damage to fruit and vegetable farms in New Hampshire until the end of 2018 growing season. Only in one situation, on a commercial orchard, a pesticide application was recommended for late maturing apple varieties to reduce the potential for fruit damage from BMSB in New Hampshire. In 2019 and 2020, from August through September, BMSB trap captures exploded in numbers. Damage from stink bugs was detected on apple fruit in September. Due to this increase, a more rigorous BMSB monitoring protocol was put in place for the 2022 and 2023 growing seasons. In 2023, a specific pesticide application for BMSB control was recommended to one grower in the trapping program.

Maintaining a network of pheromone-baited traps is the most efficient means of monitoring this insect, which spends a lot of time in the canopy of forest and shade trees. The traps also tell us where BMSB population buildup is occurring before agricultural damage begins. We anticipate more damage will take place in New Hampshire in future years.

BMSB damage on tree fruit does not become visible until 2 to 4 weeks after feeding occurred, so relying on fruit damage as a monitoring technique could result in detecting BMSB presence too late to prevent economic losses to apples or peaches.

By monitoring for it within the growing season, UNH CE will be able to inform farmers when it begins to arrive in their regions, and we hope to help them prepare to manage this pest using the least amount of insecticides. Work is currently being done by researchers in Mid-Atlantic States and New York to help farmers learn which pesticides are most effective, along with determining if there are any cultural or biological options effective for controlling this pest.

Spotted Wing Drosophila (SWD)

The spotted wing drosophila situation is relatively new to not only New Hampshire (2011), but also the United States (2008). Results of grower surveys conducted from 2012-2015 showed losses were greatest in later-maturing crops (mainly small fruits).

Based on grower reports of crop losses combined with crop price and acreage production data from the National Agricultural Statistics Service, our team calculated the total 2012 NH crop loss due to SWD was $1,516,000. In 2013, the calculated losses decreased to $529,000 and in

2014, the losses dropped to $214,000. The late appearance and slower buildup of SWD populations may have contributed to the drop in 2014. However, as SWD trapping began in 2012, we believe trapping has provided growers with a tool they have been able to use to help minimize crop losses. In fact, across the sentinel trapping locations that UNH Extension now maintains on 5 farms in New Hampshire, growers reported that they did not lose crop to SWD because trap captures provided information about insect presence on farms and growers were able to take management action. Further, growers were prepared to take control measures only once the insect was present and not before, to fully protect their crops.

Without trapping, growers may choose to spray according to the calendar to prevent infestation and crop losses like those that they saw in 2012. This could lead to higher pesticide use than necessary. We aim to continue to prevent infestation and reduce SWD losses without excessive use of pesticides by using trapping data to help growers decide if and when to spray to control the insect.

In 2023, UNH Extension and our field scout maintained a network of 23 sentinel traps on five farms in Hillsborough and Merrimack counties. The range of fruiting crops monitored for SWD trap-captures included blueberry, summer and fall-fruiting raspberries, June-bearing strawberries, grapes, cherries, peaches, and plums. These monitored crops represent a total of 94 acres of fruiting crops known to be susceptible to SWD damage. In 2023, all growers reported zero percent (0%) damage in all crops except for grapes (2.5% loss). Grapes are one of the preferred hosts of SWD and their ripening time coincides with peak seasonal SWD populations.

New Hampshire fruit producers often lose significant portions of their crops to SWD. Producers who do not practice monitoring or protect crops based on monitoring results leave management decisions to chance. For example, blueberry producers typically end up losing a minimum of 3 weeks of harvest and sales without proper monitoring and management for SWD. Late-ripening varieties are harvested from August 10th – 31st. During this three-week window, we would expect each acre to produce about 2,400 pounds (2021 NASS) of fruit and selling for an average of $3.00/lb. All of the participating farms reporting in 2023 said they experienced 0% crop loss due to SWD, thus our program assisted growers in successfully realizing the full harvested value of $7,200 per acre. Realizing that growers divide their plantings into early, mid, and late season varieties to extend their harvest and marketing season, protecting that last third of the crop through harvest, allowed growers to realize the full $46,800 in crop value over the 19.5 acres reported.

Beyond dollar savings, reduced insecticide spraying can help protect populations of beneficial insects: predators, parasitoids, and pollinators. Fewer sprays also reduce farm worker exposure to pesticides, particularly those involved with spraying, pesticide mixing & loading. Reduced spraying also reduces the likelihood of drift, and the risk of environmental contamination. It can help keep farms in business, growing locally produced food to meet the rising demand for fresh, local products.

V. How will your goals be accomplished? (i.e., experimental design)

- One IPM scout will be hired with NHDAM&F – IPM Grant funds to conduct on-farm monitoring and scouting.

- We will work with up to fifteen growers/farmers in New Hampshire on weekly monitoring

of insect pests, and check traps to determine need, frequency, and timing for insecticide control applications. Also, we will work with five (5) additional self-reporting farms to provide traps and lures and check in weekly via email or text message on trap catch numbers and recommendations.

Sweet Corn

o European Corn Borer - two Heliothis traps with Scentry E-strain or 'New York' type pheromone lures and the Scentry Z- strain or 'Iowa' type pheromone lures changed every four to six weeks from May through October.

o Corn Earworm - Heliothis trap with Hercon pheromone lure traps changed every two weeks from July through October.

o Fall Armyworm - bucket or canister trap with Scentry FAW four component pheromone lures changed every four to six weeks from July through October.

o Western Bean Cut Worm - bucket or canister trap with Trece pheromone lures changed every four to six weeks from May through October.

Vine Crops

o Squash Vine Borer - Heliothis trap with the SVB pheromone lures changed every four to five weeks from June through September.

Brown Marmorated Stink Bug

o Brown Marmorated Stink Bug - 4-foot-tall pyramid trap with an attractant lure and/or sticky trap with an attractant lure will be used. The lures are changed according to recommendations (10-week lure) from the manufacturer.

Spotted Wing Drosophila

o Spotted Wing Drosophila - drowning traps will be utilized for 2024, but the trapping protocol is evolving and will be updated as needed.

• We will check traps throughout the 2024 growing season. Some insects are blown into NH on wind currents, so growers/farmers do not know when the insects arrive until damage appears, which could lead to the growers/farmers applying unnecessary sprays for prevention.

• A regular report will be published throughout the growing season and made available through UNH Extension marketing channels. If there are major insect outbreaks, we will consider disseminating alerts through additional means, including Weekly Market Bulletin.

• At the end of the season, participating farmers in the program will complete a survey/evaluation to measure impact.

VI. Sampling Methods (if applicable):

• On-farm monitoring for insect pests will be conducted during the 2024 growing season on a minimum of fifteen operations in New Hampshire with UNH CE personnel assisting. Also, we

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will work with five (5) additional farms to provide traps and lures and check weekly via email or text message on trap catch numbers and recommendations.

• Trap counts will be reported to growers weekly. Growers are encouraged to participate in the monitoring to gain knowledge and skills needed to best utilize and interpret data for informed pest management decision-making.

• Any pheromone lures or baits used in the trap will be changed according to manufacturer recommendations.

• Working with the growers/farmers, some traps will be moved according to crop conditions and maturity.

• Depending on how the traps are used in the field, material breakdown of the traps during growing season and storage of the traps, a lifespan of two or more years can be expected prior to the need for replacement.

VII. How will your data be evaluated?

• At the end of the season, growers/farmers in the program will complete a program evaluation survey to be reviewed by UNH CE personnel. Number of sprays applied per sweet corn field will be compared to trap counts. The growers' perspective of the amount of sweet corn ears damaged due to insect damage will also be evaluated.

• Based on the monitoring counts collected during the season, UNH CE can decide if additional educational programming needs to be developed for fruit and vegetable growers/farmers in the state.

• Program evaluation reporting will be conducted by February 1, 2025, to allow time to compile grower survey results and process program impact data. This report will be provided to the NHDAM&F, as well as partner organizations who may benefit from the data.

VIII. Explain how the results of your project will be shared/publicized.

All published literature (papers, presentations, publications, advertisements, etc.) must contain a statement attributing funding to the New Hampshire Department of Agriculture, Markets and Food IPM Grant Program. Publications must be submitted with the final report.

• A weekly visit to each grower will be made to monitor trap counts where the grower will be provided information on need, frequency, and timing for insecticide control applications.

• Weekly scouting and trapping data will be posted online for program participants, as well as non-participating growers, researchers, agricultural consultants, etc., to view and utilize in pest control decision making.

• Updates on insect pest situations will be given at scheduled grower twilight meetings throughout the growing season.

• If major insect outbreaks occur, warranting special alerts, we will disseminate this information through media channels, including the Weekly Market Bulletin.

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• A presentation on the results of this project will be developed and presented to vegetable growers/farmers upon request.

IX. Detail how other groups may adopt some of the information you learn or develop:

• The UNH CE Extension specialists will be available to present the information described above. Additionally, UNH specialists participate in weekly calls with Extension representatives from all New England states. Here, our weekly trapping data and pest management recommendations are shared to benefit growers, researchers, and Extension specialists in the region.

Provide a complete list of all persons involved in the proposed project; include the names, addresses and phone numbers of the individuals.

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