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New Hampshire  
Department of Agriculture,  
Markets & Food

Lorraine S. Merrill, Commissioner

March 3, 2016

Her Excellency, Governor Margaret Wood Hassan  
and the Honorable Council  
State House  
Concord, New Hampshire 03301

Dear Governor Hassan and Honorable Council:

**REQUESTED ACTION**

Authorize the New Hampshire Department of Agriculture, Markets and Food, Division of Pesticide Control to grant funds and enter into a Cooperative Project Agreement, in the amount of \$48,660, with the University of New Hampshire Office of Sponsored Research, vendor #177867, for the advancement of agricultural research and to assist in the promotion of Integrated Pest Management practices in New Hampshire, for the period from Governor and Council approval through April 1, 2017. 100% Other Funds - Integrated Pest Management Fund.

Funding is available in account, Integrated Pest Management, as follows:

**02-18-18-183010-21820000 INTEGRATED PEST MANAGEMENT**

OBJECT


<u>CLASS</u>	<u>ACCOUNT</u>	<u>FY 2016</u>	<u>Total</u>
075-500590	Integrated Pest Mgmt	\$48,660	\$48,660

**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, "2016 IPM Program Vegetable Growers/Farmers in New Hampshire", 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. It also includes a pesticide sprayer calibration component, important to ensure proper use of spray equipment. 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.

Prior to this request the actual cumulative total of funds provided to UNH is \$39,976.

Respectfully submitted,



Lorraine S. Merrill  
Commissioner

**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 **4/1/17**. 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: **2016 IPM Program Vegetable Growers/Farmers in New Hampshire**

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

**Campus Project Administrator**

Name: Dianne Hall  
 Address: University of New Hampshire  
 Sponsored Programs Administration  
 51 College Road  
 Durham, NH 03824  
 Phone: 603 862-1942

- 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: George Hamilton  
 Address: UNH Cooperative Extension  
 Hillsborough Country  
 329 Mast Road, Room 101  
 Goffstown, NH 03045  
 Phone: 603 641- 6060

Campus Authorized Official K5  
 Date 2/18/16

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F. Total State funds in the amount of \$48,660 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: Manager, Sponsored Programs

Administration

Signature and Date:

 2/18/16

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

Name: Brian Buonamano

Title: Assistant Attorney General

Signature and Date:

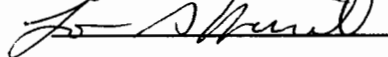
 3/18/16

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

Name: Lorraine S. Merrill

Title: Commissioner

Signature and Date:

 3-3-16

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

Name:

Title:

Signature and Date:

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**EXHIBIT A**

- A. Project Title:** 2016 IPM Program for Vegetable Growers/Farmers in New Hampshire
- B. Project Period:** Upon Governor and Council Approval through April 2017
- 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
- E. Deliverables Schedule:**  
Major Project Components:

On Farm Monitoring: April 2016 through October 2016  
 Insect/Crop: Corn Earworms/sweet corn  
                   Fall Armyworm/sweet corn  
                   European Corn Borer/sweet corn  
                   Squash Vine Borer/vine crops (June 2016 through September 2016)

The Campus shall submit a final report no more than 30 (thirty) days after the end of the project including:

- a. a detailed itemized expense summary;
- b. an evaluation of the effectiveness of the project; and
- c. the participating farms.

- F. Budget and Invoicing Instructions:** Campus will submit an invoice on regular Campus invoice form for \$48,660 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	\$21,133	0	\$21,133
2. Employee Fringe Benefits	3,166	0	3,166
3. Travel	9,720	0	9,720
4. Supplies and Services	4,600	0	4,600
5. Equipment	0	0	0
6. Facilities & Admin. Costs	10,041	0	10,041
Subtotals		0	\$48,660
In Kind Contribution		0	0
Total Project Costs			\$48,660

G. Other

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 - "2016 IPM Program for Vegetable Growers/Farmers in New Hampshire"

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	
George Hamilton, Extension Field Specialist	\$4,813
Additional Labor	
120 days @ 8 hours/day @ \$17.00/hr.	\$16,320
Benefits	\$3,166
Mileage: 120 miles/day @ 150 days @ \$0.54/mile	\$9,720
Supplies	\$4,600
Subtotal:	\$38,619
Indirect Costs at 26%	\$10,041
Total	\$ 48,660

Personnel: \$21,133

George Hamilton, UNH CE - Extension Field Specialist, (.066 FTE) is the primary person conducting the project and will be managing the finances of the grant. All recommendations that are given to the farmers will be approved through the primary person conducting the project and maybe delivered through the IPM scouts hired for the project. The primary person conducting the project will make follow-up farm visits when problems occur with the IPM scouting during the growing season. This application is requesting \$2,371 in FY2016 and \$2,442 in FY2017.

Additional Labor:

This application is requesting \$4,080 in FY2016 and \$12,240 in FY2017.

IPM Scouts for Insect Monitoring and Scouting

Two IPM Scouts will be hired for insect monitoring and scouting from April through November for various vegetable insect pests; 60 days for one IPM scout and 55 days for the second IPM scout. The IPM scouts, 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 scouts 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 scouts will collect the end of season grower/farmer/orchardist surveys.

IPM Scout for Sprayer Calibration

5 days for an IPM Scout hired for the sprayer calibration portion of the project. IPM Scout will help conduct sprayer calibrations with a specialist from April through October, 2016.

Benefits Rate(s): \$3,166

The Employee Benefit Rates are based on UNH's most current Rate Agreement with the U. S.

Department of Health and Human Services, as required under OMB Circular A-21. A copy of the Rate Agreement is provided annually to the NH Department of Administrative Services. The full Employee Benefits rate applies to salaries and wages, except for hourly and college work study wages, graduate student salaries, and faculty summer salaries. The partial rate applies to non-student hourly wages, FICA-eligible graduate student pay, faculty summer salaries, and other exceptions to faculty and staff contract pay. We are requesting \$1,227 in FY2016 and \$1,939 in FY2017.

Travel: \$9,720

Over the previous two years, the IPM scouts averaged approximately 120 miles per day conducting the weekly farm visits for checking traps and monitoring crops. The total mileage is based on the 120 days additional labor (IPM Scouts); 10 days for George Hamilton, UNH CE Extension Field Specialist; 10 days of travel for Dr. Alan Eaton, UNH CE Extension Specialist; and 10 days of travel for Heather Bryant, UNH CE Extension Field Specialist (who assists in supervising one of the IPM scouts based in Northwestern NH).

We are requesting \$2,581 in FY2016 and \$7,139 in FY2017 to support staff travel for the project.

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

Supplies & Services: \$4,600

This application is requesting \$4,600 for the purchase of project supplies/services directly related to the support of this project. Funds will be used for purchasing traps (projected at \$1,770), trap supplies (i.e. cups, tops, wires, fasteners, etc.), attractants/lures (projected at \$2,716) and paper, ink, ink cartridges, and printing for forms used by the IPM scouts. This application is requesting \$4,000 in FY2016 and \$600 in FY2017 for the purchase of project supplies/services directly related to the support of this project.

Facilities and Administrative Costs Rate: \$10,041

The Facilities and Administrative Cost Rate is based on UNH's most current Rate Agreement with the U. S. Department of Health and Human Services, as required under OMB Circular A-21, unless capped by the State of New Hampshire or Federal Sponsor. A copy of the Rate Agreement is provided to the NH Department of Administrative Services when rates change.

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

Insect pests of vegetables will be trapped and monitored on a minimum of twenty-five (25) farms weekly through the summer of 2016. Insects include European corn borer, corn earworm, fall armyworm, and squash vine borer. Sprayer calibration demonstrations will show farmers how to apply pesticides properly.

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

## IPM COMPONENT

### Sweet corn

- Monitoring European corn borer, corn earworm and fall armyworm with pheromone traps to determine need, frequency and timing for insecticide control applications.
- Reduce damage caused to sweet corn by the European corn borer, corn earworm and fall armyworm by application of properly timed insecticide applications.

### Vine crops

- Determine when squash vine borer is active on vegetable farms in New Hampshire and giant pumpkin patches in the state of New Hampshire.
- Work with vegetable and giant pumpkin growers on monitoring squash vine borer using Heliiothis traps with the Pacific Biocontrol Squash Vine Borer lure to determine need, frequency and timing for insecticide applications.
- Reduce damage caused to cucurbit crops by the squash vine borer thru application of properly timed insecticide applications.

## SPRAYER CALIBRATION COMPONENT

### Sprayer calibration

- Conduct sprayer calibration on farms in the State of New Hampshire to ensure proper application of pesticides

## IV. Economic and Environmental Impact

### IPM COMPONENT

Considering the pattern and severity of fall armyworm and corn earworm populations in 2013, sweet corn IPM saved participating growers \$15,615 in pesticide and \$18,728 in labor and equipment costs, along with an increase of \$102,354 in retail crop sales due to the reduction in sweet corn cull rate from insect damage following the IPM program recommendations. We anticipate there could be positive impacts from our sweet corn work on chrysanthemum and pepper crops. European corn borer also hits 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.

In 2014 sweet corn growers using the IPM program sprayed 3.10 fewer sprays than before involvement in the current IPM program. This savings is valued at \$19,082 in pesticide and \$22,898 in labor and equipment costs. The reduction in sweet corn cull rate from insect damage due to the IPM program, as reported by the participating growers resulted in increase of \$82,168 in retail crop sales. Total annual impact of sweet corn IPM program: \$124,148.

In past years, participating growers reported the vine crop IPM work saved \$5,000 on insecticides to control the squash vine borer. Neither we nor our clientele have been able to measure reduction in crop losses from the squash vine borer work, but observation indicates it is effective, especially on bush-type crops of Cucurbita pepo or Cucurbita maxima.

In 2014, the 14 growers participating in the squash vine borer IPM program, reported they sprayed less than they usually did prior to the IPM program. An average of 1.90 sprays on 270 acres of summer squash, winter squash and pumpkins were not applied based on the IPM program. Growers noted no plant loss due to squash vine borer. This savings equaled over 67.4 gallons of pesticides not applied, saving \$5,372 in materials and \$12,790 in labor and equipment costs.

In addition to dollar savings, reduced insecticide application protects populations of beneficial insects including predators, parasitoids, and pollinators. Fewer spray applications also reduces farm worker exposure to pesticides, in particular those involved with pesticide mixing and loading. Reduced spraying also reduces the opportunity for drift and the risk of environmental contamination. It contributes to farm profitability, which ensures a supply of locally produced food to meet the rising demand for these products. Finally, while on weekly farm visits, our scouts provide valuable early warning information to farmers about other pests. As an example, over the past three years, IPM scouts were the first individuals in NH to notice Northern Corn Leaf Blight and consequently warnings were made to the agricultural community.

## SPRAYER CALIBRATION COMPONENT

Advances in agricultural chemicals have made precise application of pesticides much more important, not only because of the cost of the chemicals but also because of the danger of off-target spray drift. The economic impact of spray drift comes not only from the loss of chemicals that should have been applied to the crop, but also from the potential damage the chemicals may cause to adjacent crops, the contamination of surface and ground water supplies, and health risks to animals and people. Legal liability costs have been rising recently, justifying added attention to properly calibrated and operated spraying equipment.

Reasons for calibrating pesticide sprayers:

- Chemicals should be applied at the proper rate to be effective and safe without causing pollution. The calibration test indicates the application rate with selected nozzles, pressure, sprayer design, and travel speed.
- The operator must know the application rate (from the pesticide label) to determine the proper amount of chemical(s) to add to the sprayer tank. Once the actual application rate is known, it is easy to determine the acreage covered by a tankful or part of a tank.
- Applying a pesticide at an incorrect rate is disadvantageous. Using more than the desired amount of chemical is wasteful, may violate label rates, and may pollute the environment. Too low an application rate probably will not be effective, and money will have been wasted on the material and its application.
- Actual application rates in the field may vary from nozzle catalog values, because of pressure gauge error, wheel slip, speedometer error, and friction loss in the plumbing. A catalog is satisfactory for selecting the correct nozzles, but the sprayer must be checked under actual operating conditions to adjust the pressure for the exact application rate required.

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

## IPM COMPONENT



- Two IPM scouts will be hired with NHDAM&F – IPM Grant funds to conduct on-farm monitoring and scouting.
- We will work with up to twenty-five growers/farmers in New Hampshire on weekly monitoring of insect pests, check traps to determine need, frequency and timing for insecticide control applications.

#### Sweet Corn

- o European Corn Borer - two Heliiothis 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 - Heliiothis trap with Hercon pheromone lures and the lures changed every two weeks from July through October.
- o Fall Armyworm - bucket or canister trap with Scentry FAW four component pheromone lures and the 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 - Heliiothis trap with the Pacific Biocontrol SVB pheromone lures changed every four to five weeks from June through September.
- We will check traps throughout the 2016 growing season. Some insects are blown into NH on wind currents, so growers/farmers do not know when the insects arrive until damage appears or the growers/farmers apply unnecessary sprays for prevention.
- Work with Dr. Alan Eaton, the UNH CE IPM Coordinator and Extension Entomology Specialist, to determine if any special news releases need to be made on the status of any insect outbreaks.
- If there are major insect outbreaks, we will consider disseminating alerts through additional means, including Weekly Market Bulletin.
- At the end of the season, growers/farmers in the program will complete a survey dealing with the project.

#### SPRAYER CALIBRATION COMPONENT

- One scout will be hired with NHDAM&F – IPM Grant funds to help conduct sprayer calibrations.
- The participating growers/farmers who complete sprayer calibration with the UNH Cooperative Extension specialists and the IPM scout would be eligible to receive one private recertification credit if they participate in the calibration of the sprayer and have a NH private restricted use license. Each participant will be given fact sheets describing proper sprayer calibration. If needed, adjustments will be made to the sprayer until it is properly calibrated. The calibration information will be recorded for the farmers to keep in their records.

#### VI. Sampling Methods (if applicable):

## IPM COMPONENT

- On-farm monitoring for insect pests will be conducted during the 2016 growing season on a minimum of twenty-five operations in New Hampshire with UNH CE personnel assisting.
- Weekly trap counts will be reported to the growers/farmers and we hope growers/farmers will participate in the monitoring.
- Any pheromone lures or baits used in the trap will be changed according 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; traps may have a life of two or more years and will need to be replaced.

## SPRAYER CALIBRATION COMPONENT

- Does not apply

VII. How will your data be evaluated?

## IPM COMPONENT

- At the end of the season, growers/farmers in the program will complete a program evaluation survey to be reviewed by the UNH CE IPM Coordinator and/or other UNH CE personnel. Number of sprays per sweet corn field applied will be compared to trap counts and grower's concept of the amount of sweet corn ears damaged due to insect damage will be evaluated.
- Based on the monitoring counts collected during the season, UNH CE can decide if additional educational programming needs to be developed for vegetable growers/farmers in the state.

## SPRAYER CALIBRATION COMPONENT

- Does not apply

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.

## IPM COMPONENT

- A weekly visit to each grower will be made to monitor trap counts where the grower will be provided the information on need, frequency and timing for insecticide control applications.
- Updates on insect pest situations will be given at scheduled grower twilight meetings throughout the growing season.

- Pending agreement by participating growers, trap catches will be posted on UNHCE's website, for anyone to access whenever he/she wishes. This will support decision-making by growers beyond those directly involved, and by other agricultural workers.
- If there are any major insect outbreaks, we will consider disseminating alerts through additional means, including Weekly Market Bulletin.
- A presentation on the results of this project will be developed and presented to vegetable growers/farmers upon request.

#### SPRAYER CALIBRATION COMPONENT

- From the information gathered during the on-farm calibration, sprayer calibration fact sheets will be revised. A presentation will be developed on how to calibrate a sprayer which includes the results of the farm calibrations and will be presented to different grower groups.

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.

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

George Hamilton, Extension Field Specialist

Mailing Address:

UNH Cooperative Extension – Hillsborough County

329 Mast Road – Room 101

City: Goffstown State: NH Zip: 03045

Telephone: day: (603)641-6060

Fax: (603)645-5252

email: george.hamilton@unh.edu

Dr. Alan Eaton, Extension Entomology Specialist

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Fax: (603)862-1713

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Heather Bryant, Extension Field Specialist

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