

## **Progress Report to the Maine Potato Board Research Subcommittee**

Project Title: PMIF Grant Request 2015 Tower Based Aphid Trapping System  
Submitted by the Maine Potato Board to Maine Agriculture, Conservation and Forestry

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University of Maine Cooperative Extension

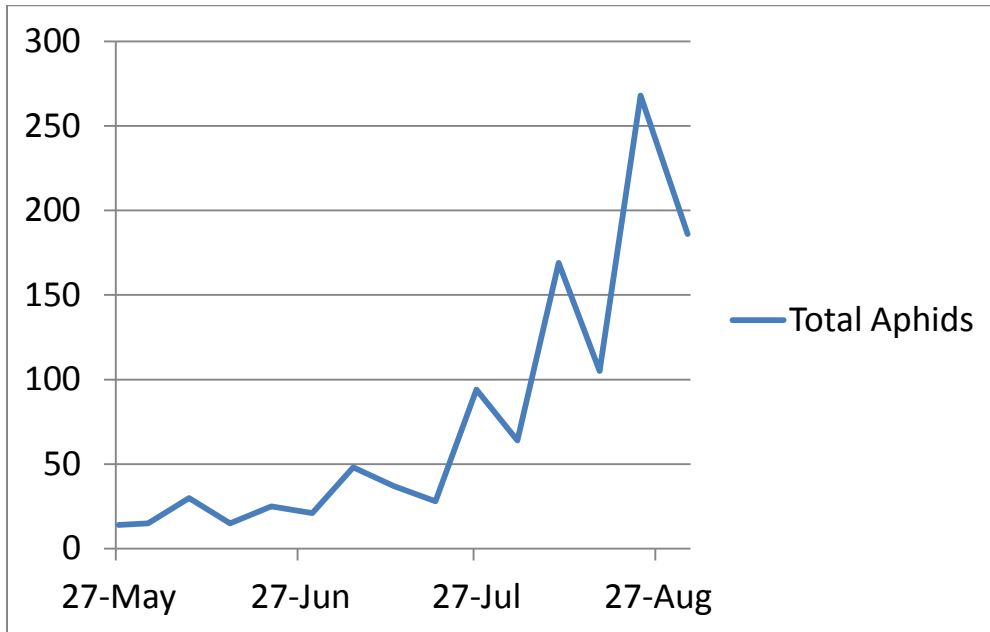
### Summary Aphid Tower Project

New strains of PVYn transmitted by aphids have the potential to seriously affect the yield and marketability of Maine's commercial and seed potato crops. A trial tower based aphid trapping project was undertaken in 2014. The 2014 trial showed that aphid flights and species identification found in and around commercial potato fields can be effectively monitored using the towers. This project expanded the number of towers to 6 which will be located in diverse areas of Aroostook County. Data collected from the towers will aid growers and crop consultants to develop effective aphid management schemes.

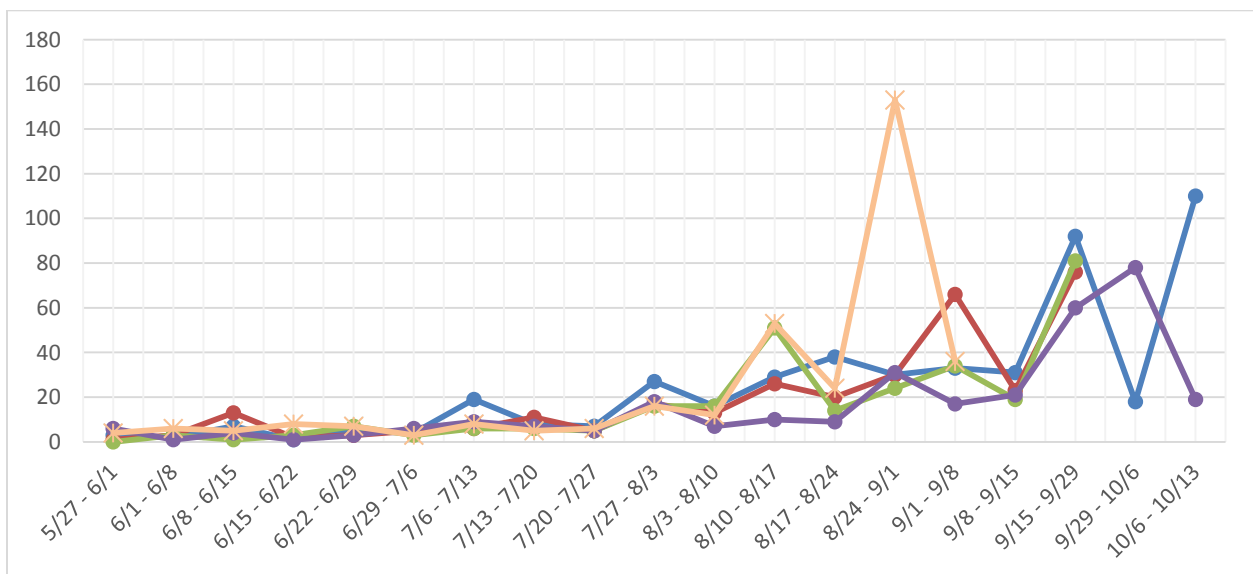
Five, sixteen foot high tower trap traps were constructed by Haines Manufacturing with four sticky card holders located at sixteen feet and at the six foot level. These card holders are adjustable and able to be positioned directionally. With the assistance of Steve Belyea, PMIF Program Manager, towers were located in St. Agatha, Washburn, Masardis, Bridgewater and Monticello. Towers were placed in May and cards were collected and examined on a weekly bases. Cards were placed on the points of the compass, so that direction of collection could be recorded.

## Results

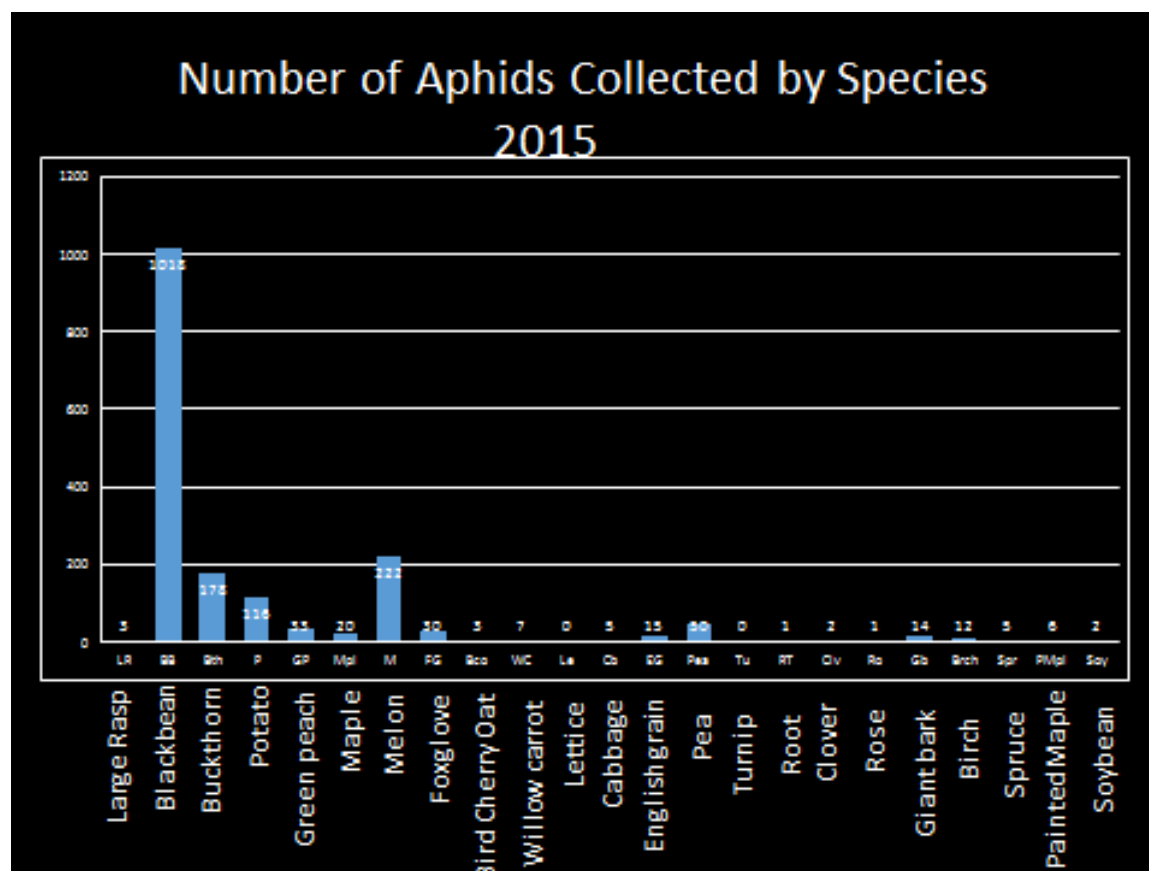
Total aphids collected by tower traps in 2015.



## Individual trap comparisons



There can be rather significant variations in the numbers and species of aphids collected from the various locations. It is interesting to note that the spike in collections with one trap in late August and early September was due to Black bean aphid, *Aphis fabae*. Black bean aphid was the species with the greatest number of individuals collected over the season.



Twenty-three different species of aphids were collected during the growing season. Black bean aphid was the species with the greatest number of catches and was the “driver” of the aphid activity numbers. This aphid species was active throughout the growing season with a peak late in the season. The four colonizing species were also collected during the growing season, of these, Buckthorn was the most active.

It is anticipated that these traps will be thoroughly integrated into the insect monitoring aspect of the Potato Integrated Pest Management program. This trapping system will assist growers and researchers to better monitor aphid activity.

Part of the intent for this project was to obtain additional information of different aphid species flight patterns. It may be possible to forecast flights of some species using growing degree-days. Sticky card traps were placed in area potato fields during the 2013 and 2014 growing seasons. In 2015 information from the tower trapping system sticky cards were used as the bases for monitoring the first occurrence of specific aphid species.

Here is an example of how a predictive information system may be constructed using growing degree day information.

### **Calculating Growing Degree Days**

$$\text{GDD} = \frac{\text{max temp.} + \text{min temp.}}{2} - \text{base temp.}$$

Black bean aphid, *Aphis fabae*

First collection 2013	June 3 to June 7	40 degree base collected from May 15	271 to 331
First collection 2014	June 2 to June 6	40 degree base collected from May 15	279 to 364
First collection 2015	May 27 to June 2	40 degree base collected from May 15	201 to 318

During this period of time, at a 40-degree base temperature, approximately 30 gdd per day are accumulated. With the data collected over three years it appears that the first collection of *Aphis fabae*, the Black bean aphid occurs within two to three days of accumulating 201 growing degree days with a 40 degree F. base temperature collected from May 15. This information will allow Cooperative Extension to alert growers to the initial Black bean aphid flight in advance to occurrence rather than reporting that it has already happened.

Information is being shared with Dr. Russell Groves, Entomologist with the University of Wisconsin on aphid species and collection patterns to see if a model constructed for Wisconsin will work in Maine.

Many of the results from this project have been presented to the Maine Potato Industry at the Potato Pest Management Conference which was held on December 2105 and the 2106 Maine Potato Conference held January 2016.