

News from the Potato Lab



Spring 2018

CHANGES COMING FOR SUMMER AND POSTHARVEST TESTING FOR 2018 CROP

Discussions at the February MPIA board meeting led to some important changes to our summer and postharvest testing for the 2018 crop. For summer testing, we will only test PVY and not PVA or PVX. Nina noted that we did not have any detections of PVA in either summer or postharvest for the 2017 crop, and only 2 detections of PVX, and they were in seed lots that would be flushed out. This will result in a small reduction in summer testing costs, but not quite as much as you might anticipate. All of the costs for leaf picking and processing will remain the same with one virus as with three. The reduction in total cost will be from a lower number of ELISA plates and a modest reduction in lab time.

Another change will come with allocation of number of postharvest test samples by generation, and the opportunity to do more dormant tuber testing. A consistent frustration with our postharvest Hawaii results is that we don't get a full sample count represented in the leaves that are picked. On average, about 70% of the tubers planted end up with leaves being picked. Because of this, the ELISA results are often proportionally higher than the visual readings. For G1 and G2, this often provides inadequate information for making decisions on recertification. It was also noted that 400 tubers is inadequate to make a good decision, even if all tubers are adequately sampled. To provide more information, it was decided to increase the number of samples of G1 and G2 and only require one 400 tuber sample for G3-G5. In addition, growers will have the opportunity to send one G1 and one G2 sample from each lot to the lab for PCR testing. With PCR, the sample count is guaranteed because all tubers are sampled.

The new sampling rates are listed below:

G1	2 acres or less	One 400 tuber sample
	>2 acres	2 samples
G2	Up to 20 acres-	1 sample
	21-40 acres -	2 samples
	41-80 acres -	3 samples
	>80 acres -	4 samples
G3-G5	1 sample - regardless of acreage	

NEW PUBLICATION COMING SOON! Jessica Rupp

As biocontrol options on the market continue to grow, I believe it is time for a new publication. There are over 70 biological products available for potato today. Biopesticides are certain types of pesticides derived from such natural materials as animals, plants, bacteria, and minerals.

While some Montana growers have devoted organic acreage, these available products, such as LifeGard (a product you might have heard about around here!) can be used effectively in conventional systems. In organic production, any product that you are using has to meet a particular set of guidelines. A helpful resource is The Organic Materials Review Institute (OMRI).



OMRI listed products are available for use in certified organic production under the USDA National Organic Program. Find more information at <https://www.omri.org>. Don't forget to check out April's edition of Potato Grower Magazine for an update of organic products.

Expect this new publication to cover much the same information that is contained in our Disease Management Guides. For ease, OMRI-certified products that have been appearing in the guide will remain there until a full transition to the new guide is completed. In the new guide you will find all the newest products as well as some greenhouse performance data of products we've been hard at work testing. We will be sharing upon completion.

As always, if you have any questions or concerns, please don't hesitate to contact me at 406-404-0789!

PEST MANAGEMENT RECOMMENDATIONS

Dr. Jessica Rupp has updated fungicide recommendations for 2018. A copy of the guide is included with the newsletter and can also be found at www.msuextension.org/pspp and the Potato Lab website www.montanaspud.org.

THANK YOU from Susie Siensen

I'm proud to have worked with two generations of Montana seed potato families throughout my 25 years in the Potato Lab. I was privileged to also involve my own family in this endeavor, for which I am grateful. The profession allowed me to combine my passion of working in a lab with a newfound love of agriculture.



I wholeheartedly thank the potato growers and Potato Lab staff- Mike and Anna Sun, Elaine, Eileen, Terri, and more recently, Nina, Becky, Anna, Barb, Alice, and Kim Prosek for their support and for being great people to work with.

After April 13, 2018, I'm looking forward to relaxing full time and traveling around Montana in the summer. I may explore learning more about computer programming languages, may find a new experience with a part-time job, and if this new

experience ends up tied to agriculture, it's bound to be an exciting adventure.

Steve Hystad on board as new Laboratory Supervisor and Assistant Plant Pathologist



I am extremely excited to supervise the MT Seed Potato Lab. Six years ago I had received an excellent opportunity to pursue a M.S. degree in Plant Sciences under the tutelage of Jack Martin, Phil Bruckner, and Mike Giroux. Our focus to identify the genetic basis of wheat end use quality traits cultivated my interest in applied research with hopes to provide sustainable advancements in food and agriculture technology. Upon graduating, my research aspirations and love of biotechnology had led me to Simplot Plant Sciences where I worked with the molecular research teams to characterize novel mutations that impact quality traits of Potato and other fresh market produce. After leaving Simplot, I spent some time serving as the main technical expert at a local software company that analyzes Next Generation Sequencing (NGS) data to filter, annotate, and identify pathogenic variants associated with cancer and other hereditary diseases in humans. While this 'sabbatical' into human genetics and disease was exciting, I knew my passion lay with agriculture, potato production, and plant biotechnology.

The Seed Potato Certification Program at MSU serves as a critical component in a holistic health management program that ensures Montana's seed potato growers produce clean, quality seed. As a new addition to the Potato Lab, I will be working with the team to continue our existing screening pipeline and strive to implement new diagnostic tests to continually address the needs of the seed potato industry. I look forward to meeting you and fostering

new relationships with all Montana seed potato growers.

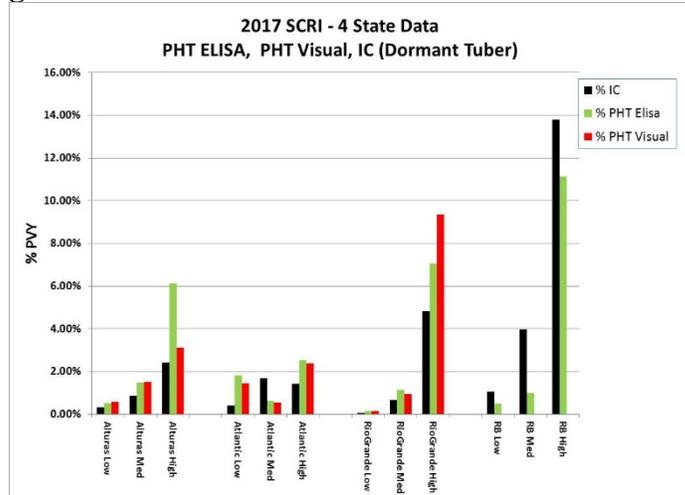
COMPARING DORMANT TUBER TESTING WITH A FIELD POSTHARVEST TEST

For the past three years, MSU has worked to optimize and scale-up PVY detection in dormant tubers and compare these results with PVY detection in the Hawaii PHT. The PVY titer in dormant tubers is usually not high enough to detect with traditional ELISA (As the dormancy breaks and the tubers start to sprout, the PVY titer increases and can be detected with Elisa). We can better detect these low levels of PVY in dormant tubers using RNA and PCR.

However, it is easy to miss the virus during sampling and underestimate the PHT. We are currently using two molecular techniques to detect PVY in dormant tubers. Susie and Anna (and Steve) isolate RNA from tubers using a technique called Dellaporta. This technique is extremely sensitive but is time-consuming limiting the number of lots that can be processed in a day. Alice has been using a technique called immunocapture(IC). In IC, tuber plugs are crushed in the hydraulic press and the qPCR is run directly on the resultant sap. IC is slightly less sensitive than Dellaporta, but far less labor intense.

In 2017, MSU collaborated with 3 other states (ID, CO, and WI) to compare Immunocapture results with PHT results for PVY detection. Each state chose one variety and selected three fields of seed potatoes containing high, medium, and low levels of PVY based on summer testing. The variety for Montana was Alturas. Four 400-tuber replicated samples from each field were tested in the labs prior to shipping to HI for PHT. Data for each 400-tuber lot included Immunocapture (black), PHT Elisa leaf results (green) and PHT visual results (red). The Montana data is show in the following chart or the data from 4 states is shown in following chart.

Comparison of dormant tuber testing (immunocapture RT-PCR and ELISA) with field growout – 4 different cultivars



Conclusions.

1. Immunocapture can be used to detect PVY in dormant tubers but will underestimate virus, especially in lots with higher levels of PVY.
2. Immunocapture is slightly less sensitive than Dellaporta RNA extraction but is less labor intensive and more amendable to scale up.
3. The challenge is to read the IC plates and determine what is a positive detection and what is background.

DATES TO REMEMBER

- May 5 – Postharvest Fees Due
- June 10 – Registrations Due
- June 12 – MPIA Board Meeting, Missoula