

SeedBytes

A quarterly newsletter produced for the New Brunswick Seed Potato Industry

Storage Management to Reduce Storage Losses

By Dr. Khalil Al-Mughrabi — Potato Development Centre



In preparation for the upcoming potato storage season, we must be aware of the potential for the storage of potato tubers infected with late blight (*Phytophthora infestans*). Since there are no registered chemicals that can be applied to tubers going into storage to control late blight, careful harvest preparation and wise storage management decisions are your best defences. You cannot cure tubers of late blight, but you can minimize storage losses from tuber infections.

Blighted tubers are subject to secondary infections. **Minimize the potential for soft rot** by drying the tubers as quickly as possible. Continuous air movement (minimum 2 cfm/barrel or 1.2 cfm/cwt) for the first 30 days may be necessary. Do not wet the tubers going into storage.

Cool the pile to the holding temperature as quickly as possible. Avoid harvesting tubers with a pulp temperature above 15 °C (60 °F).

Do not overfill the storage. This hampers air flow and increases the chances of tuber breakdown from soft rot and pink rot. There should be at least 0.6 m (2 feet) between the top of the pile and the storage ceiling.

Wet conditions late in the season increase the risk of Pink Rot (*Phytophthora erythroseptica*) and **Pythium leak** (*Pythium* spp.). Tubers grown in areas where water accumulates can become infected with pink rot in the field.

Pythium leak invades tubers through wounds. These diseases can hasten the spread of bacterial soft rot in storage through watery ooze from infected tubers. Good ventilation in storage is essential to control these diseases. With adequate air circulation, infected tubers will become mummified and not undergo a wet rot. If we have late rains this season, be on the look out for pink rot and Pythium leak.

Remember -- Restricted airflow in storage leads to hot spots and tuber breakdown

For more information, contact Dr. Khalil Al-Mughrabi at 1-866-778-3762 or khalil.al-mughrabi@gnb.ca.

Storage Checklist:

- Make the pile as clean as possible, remove dirt and debris.
- Do not overfill the storage.
- Adequate ventilation is essential to dry tubers and prevent secondary infections.
- Avoid free moisture in or on the pile.
- Monitor the pile closely for any signs of hot spots.
- Be prepared to move the tubers quickly if necessary.

Inside this issue

Aphid Monitoring Recap...	2
Volunteers.....	3
Seed Pieces.....	4
Dr. Tarn's Retirement.....	4

Upcoming Events:

Potatoes New Brunswick Annual General Meeting will be held on Friday, November 28th at 9:00 AM at the Perth-Andover Legion.

Potato Expo 2009, a consolidation of the National Potato Council's Seed Seminar, Fresh Potato Industry Outlook Summit and Chip Seminar will be held January 7th—9th, 2009 in San Antonio, Texas. For more information visit:

www.potato-expo.com

Electronic versions of all SeedBytes issues can be found online at www.gnb.ca, then click language preference, Departments and Agencies/Agriculture and Aquaculture/ Potatoes/SeedBytes and select the month for the issue.

The newsletter link has been emailed to all recipients. If you do not have the link, contact Andrew Sullivan at andrew.sullivan@gnb.ca or 1-866-778-3762.

New Brunswick Aphid Summary—2008

By Dave Wattie—Potato Development Specialist— Integrated Pest Management



Sustainable crop production in the Upper Saint John River Valley requires a balanced approach to pest management. Of primary importance in this region is the management of aphid species and their impact on the potato crop. Aphids are ubiquitous. They can be found on both cultivated and wild plants, throughout eastern Canada and the north-eastern United States. Although some species of aphid are host-specific, many feed on a variety of host plants including potato. In general, these species are monitored in the same manner.

Biology

Aphids are small, soft-bodied insects with complex life cycles. Often pale green in colour, they can vary from black to red to green. Some species, like the Potato Aphid (*Macrosiphum euphorbiae*) survive winter in the egg stage. Other species, most notably the Green Peach Aphid (*Myzus persicae*), carried on wind currents from the south, migrates into this region each year. Life cycles may involve more than one host species. Aphids are the only insects that give birth to live young. Reproduction may be sexual or asexual. Aphids begin to appear in May and several generations are produced over the summer. Aphids may be winged or wingless.

Symptoms and Damage

Aphids pierce plant tissue, sucking out plant juices, primarily from shoots, leaves and flowers. Excessive feeding damage may lead to wilting or tissue distortion. However, only when aphid populations are extremely high, does yield suppression result from direct aphid feeding. Of primary concern to potato growers is not the direct feeding of aphids, but rather their ability to transmit viruses. The two viruses of major concern are Mosaic (aka Potato Virus Y) and Potato Leaf Roll Virus (PLRV). The primary vector of these viruses is the Green Peach Aphid.

Scouting Techniques

Aphid infestations are usually localized in their distribution. High populations develop when the weather is warm and humidity is high. Plants should be visually inspected throughout the summer to determine numbers present. The standard passive field sampling method is to use a yellow pan trap. The pan is set in the field and filled with water and a small amount of liquid soap. In our program, samples are collected weekly and sent to the lab at the Potato Development Centre (PDC), Wicklow.

In 2008, the PDC managed a network of 72 yellow pan traps. The species of interest included Green Peach Aphid, Potato Aphid, Buckthorn Aphid and a fourth category of “Other Species”.

Although there may be a trend towards increasing total aphid numbers, the overall population still remains at low levels. This is probably due to the wide spread use of neonicotinoid insecticides as in-furrow applications at the time of planting. This class of insecticide provides systemic protection to the potato plant from the time of emergence until well into the growing season.

The total aphid catches in 2008 remained low throughout the season. As of the end of August, no Green Peach Aphids were recorded in our trapping network. Additionally, counts in each of the other three aphid categories also remained low throughout the season. As virus levels in the seed potato crop are influenced by aphid population pressures, post harvest testing will indicate whether or not this suppressed population reduced the transmission opportunities for seed borne viruses.

For further information, contact Dave Wattie at the PDC at 1-866-778-3762 or by e-mail at david.wattie@gnb.ca.

Aphid Alert Summary	2008
Total # of Traps	72
# of Growers Participating	45
	<i>Aphids trapped per week</i>
Average Aphid Catch (all species)	1.16
Median Aphid Catch (all species)	0.39
Average Green Peach	0.00
Median Green Peach	0.00
Average Potato	3.03
Median Potato	2.54
Average Buckthorn	0.28
Median Buckthorn	0.17
Average Other	1.19
Median Other	1.25



Volunteer Potato Control



Gavin Graham—IPM Weed Management Officer and Daniel Savoie—Development Officer—DAA

Volunteer potato plants (plants growing from un-harvested tubers; Figure 1) can be a weed problem the year following a potato crop. Winter conditions in New Brunswick are generally severe enough to control most volunteers, but if snow cover is established prior to frost penetrating the soil, large volunteer populations may be an issue the next year. These plants can be a competitive weed with most rotational crops, act as a reservoir for diseases and insects (late blight, early blight, potato leaf roll, and potato virus Y), and may perpetuate themselves by producing new tubers. Volunteer potatoes are difficult to manage in rotational crops and no one specific measure will guarantee complete control.



Figure 1. Volunteer potato in barley

When a large number of tubers are left behind in the field, there is a higher potential for volunteer plants the next season. Minimize harvest losses with proper harvester chain spacing and ground speed. The use of a foliage-applied sprout inhibitor (such as maleic hydrazide) may reduce volunteer numbers by preventing sprout growth in the spring. Winter survival is related to tuber health, environmental conditions and burial depth. A soil temperature below -2 °C (28 F) for 50 hours is generally sufficient to freeze and kill potato tubers. Avoid deep tillage in the fall: leave tubers near the surface where they are more likely to be killed by winter conditions. If possible, a delayed seeding date the following

season, preceded by a pre-seed herbicide or tillage operation, can help to control the early growth of volunteers.

Time of emergence of volunteer potatoes in the spring is quite variable due to differences in depth of tuber burial, tuber physiology and spring conditions. Timing of herbicide control can be difficult, as the

entire volunteer population is unlikely to be in the proper stage for a single herbicide application. In addition, the volunteer tuber may initiate new shoots after the first shoot is removed, further stretching out the required control window. Since the competitive ability of volunteer potatoes depends on management methods, vigour, disease incidence, tuber size, depth of burial, and crop competition, control requires many different simultaneous approaches.

General Tips for Volunteer Control

- Select a competitive crop (eg. barley) to follow potatoes, or a crop with a high potential for control (such as, Round-up Ready canola, corn or soybeans; two applications of glyphosate may be needed to control the volunteers).
- Increase crop competitiveness with adequate fertility, higher seeding rates and optimum planting date.
- Colorado potato beetle (CPB) feeding can reduce volunteer vigor (Figure 2). Defoliation by CPB alone will not prevent volunteers from producing tubers. CPB feeding, combined with an early herbicide treatment, may be enough to limit the impact of this weed, especially in cereal crops.
- Mesotrione (Callisto®) has proven effective for volunteer control in corn during research in the United States.
- Glyphosate application, pre-harvest of the rotation crop, can limit daughter tuber production in volunteers.

Table 1. Percent volunteer potato control from herbicide treatment in barley

Treatment Name	Percent Potato Control			Overall Control
	June 25	July 11	Aug. 6	
Untreated	0	0	0	None
MCPA	21	25	18	Poor
amine				
2,4-D	24	15	31	Fair
amine				
Target	53	35	28	Fair
Refine	50	39	26	Fair
Extra				
Dyvel	59	54	53	Medium
Infinity	84	36	23	Fair
Buctril M	46	25	18	Poor
Banvel	31	33	51	Medium
Pardner	38	24	14	Poor
Fluroxypyr	63	68	46	Medium
Fluroxypyr +MCPA	78	66	55	Medium
LSD (0.05)	19	25	23	

Herbicide Control in Barley

Herbicide activity on volunteer potato in cereals can be variable. To evaluate the options available, DAA initiated a trial which comprised the most commonly used herbicides in barley production and new products with potential activity on volunteer potato. Treatments were applied to a commercial barley field with an even stand of volunteer potatoes when the crop was at the 5-6 leaf stage and the volunteer potatoes had 2 to 8 leaves (June 12, 2008). Potato control ratings were taken throughout the season. The majority of treatments gave fair to poor control of the volunteer plants (Table 1). The level of potato volunteer control was quite variable across the trial, most likely due to late potato emergence. The most promising treatments included dicamba (Banvel and Dyvel) and fluroxypyr. Fluroxypyr is not currently registered for use in Eastern Canada. Infinity (pyrasulfotole/bromoxynil) was effective at the early rating time (Figure 2), although control decreased as the trial progressed. (Continued on page 4)

From a producer perspective with respect to control of potato volunteers, herbicide choice in cereals may not be as important as application timing. Most herbicides are more effective against smaller plants (2-4 leaf stage is generally ideal), so earlier application timings will be examined during the next DAA volunteer control trial. In order to make the correct choice of herbicide, the spectrum of weeds in the field should be considered. **NOTE:** These results are from only one year of trial data and additional work is required.

Conclusion

An integrated control strategy is needed for volunteer potato management. One must consider many factors, including harvest methods, weather conditions, cultural control, tillage methods, pre-crop control and in-crop herbicides, to ensure volunteer potatoes are not a production concern in future seasons. DAA staff will continue to evaluate control options for this weed.



Figure 2. Early season potato injury from Infinity application

The researchers would like to thank the cooperators Philip, Barbara and Beverly Roach for providing the trial location.

Seed Pieces

Winter Testing—Seedlot Collection

Drop-off locations for collection of seed potato lots destined for winter testing, virus testing and BRR testing will be coordinated again this year by Potatoes NB. Seedlots can be dropped at either the Potato Development Centre storage in Wicklow or the McManus warehouse in Grand Falls on Tuesday, October 21 from 9:00 am to 5:00 pm and Wednesday, October 22 from 9:00 am to 12:00 noon.

For more information, please contact the Potatoes NB office at 506-473-3036.

Seed Potato Pre-certification Directory – 2008 Entered Crop List

A pre-certification directory listing seed potatoes entered for certification in 2008 is available on the New Brunswick Department of Agriculture and Aquaculture’s website. This list is limited to information regarding varieties and seed class planted by growers when applying for seed potato crop inspection. As such it does not include any field certification numbers. Final certification numbers will be made available in the "New Brunswick Seed Potato Growers Certification List 2008" upon completion of the certification process. If you have questions, please contact Dr. Khalil Al-Mughrabi - Potato Development Centre at 1-866-778-3762 or khalil.al-mughrabi@gnb.ca

To view the pre-certification directory, please visit the following link.: <http://www1.gnb.ca/0029/00290062-e.asp>

Dr. Richard Tarn’s Retirement

By Agnes Murphy—AAFC

Dr. Richard Tarn, P. Ag. will retire from AAFC’s Potato Research Centre at the end of October after a 40-year career in potato breeding at Fredericton. Richard joined the breeding program in 1968 following completion of a PhD in Botany at the University of Birmingham in the UK. From 1986 to 2002 he was the leader of the Potato Breeding Study at Fredericton and, from 2002 to the present, he led a national program on Potato Breeding and Genetic Enhancement.

During this time, Dr.Tarn contributed to the development and release of 12 cultivars, most notably Shepody, grown widely in North America and Europe for French fry production. And, since the inception of the Accelerated Release Program in 1998, more than 75 selections have been released for industry evaluation under his direction. A dozen licences for exclusive production have resulted from this process.

Dr. Tarn’s influence has extended nationally and internationally. He held executive positions with the Potato Association of America and has traveled extensively to deliver scientific papers and to provide advice. While potato breeding was the focus of his career, he also contributed to his community through leadership in groups that brought theatrical and musical events to Fredericton. As a founding member and director of the Fredericton Botanic Garden Association, he contributed many volunteer hours to the establishment and development of a botanic garden next to Odell Park.



Dr. Tarn’s extensive knowledge and experience acquired from a lifetime of potato research will not easily be replaced.

Published by: Department of Agriculture and Aquaculture

SeedBytes is produced through a collaborative effort by Potato Development Centre staff.

Special thanks to Dr. Loretta Mikitzel for ongoing editing of this newsletter.

If you have ideas for future issues, please forward them to any Potato Development Centre staff member.