New Nouveau Brunswick CANADA
Agriculture, Fisheries and Aquaculture
Agriculture, Pêches et Aquaculture

SeedBytes

July 2006
Volume 38, Issue 4

Potatoes New Brunswick Field Day Date Set

Mark ***Thursday, August 17th*** on your calendar as the date to attend the annual Potatoes New Brunswick (PNB) Potato Research Tour. Later that morning, the McCain Foods Canada 2006 Research Tour will be held at their Florenceville Research Farm.

The PNB Potato Research Tour will start at 9:00 AM at the Hartland research plots. The Department of Agriculture, Fisheries and Aquaculture (DAFA) staff will be on hand to discuss their 2006 research trials. These trials include showcasing promising chip varieties, a seed physiological age study, comparison of various clones from the Bon Accord Elite Seed Potato Centre, and disease trials using acetyl salicylic acid (Aspirin) for rhizoctonia control and using biological control agents for fusarium dry rot control.

Tubers of yellow-fleshed, table, red-skinned, russetted and specialty varieties will be on display (see article on page 6).

Also at the Hartland site are trials by Agriculture and Agri-Food Canada (AAFC) Potato Research Centre staff. An article detailing their trials can be found on page 3. Refreshments will be provided and DAFA and AAFC personnel will be on-site to discuss their research with those in attendance.

The plots are located on Valley Farms Ltd. on the south side of the Trans-Canada Highway between the Hartland Golf Course and Day and Ross office. This research tour will conclude around 10:30 AM.

For more information on the field day, contact Dr. Loretta Mikitzel at 1-866-778-3762 or loretta.mikitzel@gnb.ca.

Inside this issue:

New Integrated Potato Pest Management Technician Hired

The Department of Agriculture, Fisheries and Aquaculture welcomes René Poirier as the new Integrated Potato Pest Management Technician. René is based at the Potato Development Centre (PDC) in Wicklow, New Brunswick.

René grew up in Shédiac, New Brunswick, and graduated from the Agricultural Technology II Program at the Centre of Excellence in Agricultural and Biotechnological Sciences (CESAB), Grand Falls in 2003. As part of his co-op training program, René completed a four month internship in Hyère, France as a floriculture technician.

Prior to his current position, René worked for a greenhouse vegetable producer and as a PDC Technical Assistant in the Pathology Program supported by Potatoes New Brunswick. In his new position, René will be working on integrated pest management programs, the provincial weather station network and grower services within the Potato Development Centre.

To contact René, call 1-866-778-3762 or e-mail rene.poirier@gnb.ca

DAFA

Insects & Late Blight Hotline

1-888-323-4040

Late Blight of Potatoes

By Dr. Khalil Al-Mughrabi—Potato Development Specialist—Pathology

Late blight is an extremely serious potato disease that causes severe damage and storage losses. The fungus can only survive between growing seasons as mycelium in living potato tissue. Infected tubers used for seed or discarded onto cull piles at farms and commercial storages, or infected volunteer potatoes that over winter in the field in provinces with milder climates or where snow cover occurs early in the fall are sources of infection for the new growing season. Though late blight most commonly occurs in cool, wet climates, it can occur anywhere when irrigation or wet conditions combine with cool temperatures to favor disease development. The late blight fungus does not require stressed plants in order to thrive and cause the disease. Under weather and crop conditions favorable to late blight, a field of potatoes can be defoliated in two to three weeks.

(Leaf with visible spores photo provided by Dr. Khalil Al-Mughrabi)

POTATO LATE BLIGHT RECOMMENDATIONS FOR 2006

Good management includes sanitation, cultural practices, field monitoring and an effective fungicide spray program.

Sanitation, Cultural Practices and Field Monitoring

1. Visually inspect seed potatoes within 24 hours of delivery. Cut a sample of tubers and look for the reddish, brown, dry rot characteristic of late blight tuber rot. A buyer has only 24 hours to request a re-inspection after delivery.

2. Test your seed for late blight before planting. Ask for a test certificate indicating freedom of late blight if buying seed.

3. Grade seed potatoes before planting. It is important that seed is graded after it is cut and any late blight tuber rot removed before planting. Infected tubers can be a source of early field infections.

4. Frequently disinfect seed cutting equipment (quaternary ammonium-based products).

5. Treat seed with a recommended seed piece fungicide immediately after cutting (mancozeb-based products).

6. Bury cull piles before crop emergence and no later than June 10, 2006. Infected tubers in cull and rock dump piles are major sources of infections. Buried tubers may germinate and grow. Rogue or treat these plants with a herbicide. Slivers and pieces of potato remaining from cutting operations should also be buried.

7. Volunteer potato plants can be source of infection. If there are volunteer potato plants in a field an effort should be made to remove these plants by roguing or herbicide treatment. In non-seed fields where late blight is found, consider applying a sprout inhibitor to control volunteers the following year.

8. Always report any suspect case of late blight immediately. If late blight is identified, roguers and other workers should wear pants and boots which can be disinfected with a bleach solution (diluted 1:9 with water) between fields or farms. Field equipment should also be washed and disinfected before entering other fields.

(Stem lesion photo provided by Dr. Khalil Al-Mughrabi)

9. Construction of a good deep hill will help restrict spores from washing down through the soil and infecting the tubers.

10. Monitor your crop. Scout fields where moisture persists after rains or dews such as low areas and along treed edges. Have a good look at stems and leaves for symptoms of late blight. Stem infections do not die during dry periods and will easily re-activate in humid weather.

11. When late blight is first identified, remove and destroy infected plants. When infected plants are rogued they should be placed in plastic bags, and then taken out of the field. Top kill or rogue an area twice the size of the area with infected plants.

12. Rolling or rotobeating a crop before top killing exposes the soil and lower canopy to drying. Rolling also seals cracks in the soil and may reduce tuber infections.

13. Top kill at least 2 weeks prior to harvest to allow time for infected tubers to rot and to promote tuber maturity and thicker skins at harvest. Vines should be completely dead at harvest.

14. Spores survive longer in wet soils. Harvest when the soil surface is dry or windrow the potatoes and allow the surface of tubers to dry before harvest.

15. Dig sprayer rows and low areas last and store these potatoes where they can be easily moved in case of problems.

16. Wet or bruised tubers are more likely to get infected with late blight. Skinning, cuts, and bruises provide direct entry points for late blight, as well as other diseases.

17. Grade potatoes before they are put into storage.

18. If late blight is seen on plants, there will likely be tuber infections. When stored, these should be ventilated with a high volume of air at low humidity until the potatoes are dry. This may lead to higher shrinkage than normal, but losses due to storage rots will be reduced.

19. Potatoes with 5% or more tuber infections are very difficult to store. These potatoes should be stored in the front of the storage or in separate bins so they can be easily removed.

Fungicide Spray Program

A preventive spray program is recommended for 2006. Systemic fungicides are used in a preventive program as part of an integrated pest management (IPM) program to control resistance. Effective control by fungicides requires good coverage of the leaves, proper rates of application and proper timing of applications.

<u>In a preventive program, the first 3 sprays are the most important sprays of the entire season</u>

Late Blight of Potatoes (cont.)

1. Begin spraying at 80% emergence using a fungicide at label rate.

2. Let the spray booms fill and run for a minute at the edge of the field before starting to spray the crop.

3. Start spraying in the opposite direction each time a field is sprayed to provide better overall coverage of a crop. This is especially true for a variety such as Shepody that has cupped leaves and it is difficult to get even coverage over the whole leaf.

4. Application volume should be at least 233 l/ha (52 gal/ha or 21 gal/acre) applied at 690 kPa (100 psi). Select a nozzle that produces a droplet spectrum between medium and fine.

5. Consider using the shortest spray interval, especially during active growth of the plants and if 20 - 25 mm or more of rain occurs in 24 hours. The spray intervals during the season should be 5 - 7 days depending on the late blight forecast.

6. The application of fungicides should continue after top killing until the plants are completely dead.

7. Copper-based fungicides can be applied with the top killer or after top killing. Copper on the soil will kill spores that wash off the leaves and stems onto the ground. These spores can cause tuber rot late in the season.

8. If an area of a field is to be top killed because of late blight infections, spray the whole field with a fungicide mixture containing a product with sporicidal action. Spray the infected area last and exit the field. Then top kill the infected area. Spray the infected area again 2-3 days after top-killing.

For further information, contact Dr. Khalil Al-Mughrabi at the Potato Development Centre at 1-866-778-3762 or by e-mail at khalil.al-mughrabi@gnb.ca

(Tuber symptom photo provided by Dr. Khalil Al-Mughrabi—DAFA)

Publication 1300 A

As mentioned in the last issue, Publication 1300 A will soon be available online. To view the new publication, which will contain up-to-date information on crop protection products and varieties, visit the potato page on DAFA's website: http://www.gnb.ca/0029/0029index-e.asp

Agriculture & Agri-Food Canada Adaptation Trials 2006

By Cynthia Murray—Potato Research Centre—Agriculture and Agri-Food Canada

As mentioned in the Potatoes New Brunswick Potato Research Tour article, Agriculture and Agri-Food Canada (AAFC) staff also have adaptation trials at the Hartland Valley Farms Ltd. location. The selections in the AAFC Adaptation Trials are categorized by end use and most are in their sixth year of evaluation in the Variety Breeding and Germplasm Enhancement Program at the Potato Research Centre, Fredericton. The National Trial includes selections from AAFC Lethbridge.

Trial entries are selected on the basis of superior performance in yield, culinary/processing characteristics, disease resistance and tolerance to mechanical injury. Those that do well in these trials, located in New Brunswick, Prince Edward Island and Ontario, become candidates for the Accelerated Release Program. This program makes potential varieties available for industry evaluation prior to their release as proprietary varieties.

AAFC trials at the Hartland location include:

- *Chip Trial* – there are ten entries plus Atlantic and Snowden as checks.
- *Fresh Market Trial* – there are seven entries plus Chieftain, Kennebec, and Yukon Gold as checks.
- *National Adaptation Trial* – sites are located in Prince Edward Island, New Brunswick, Manitoba, Saskatchewan, Alberta and British Columbia. In the East Category , there are three French fry and three fresh market entries. In the West Category there are seven French fry entries from Lethbridge, with Russet Burbank and Shepody as checks.
- *Pigmented Flesh Demonstration* – there are eight entries (five repeats from 2005 trial) plus Congo as a check.

For more information on any of these trials, please contact Cynthia Murray at *Murraycr@agr.gc.ca*, or Agnes Murphy at *MurphyA@agr.gc.ca* or call (506) 452-3260.

Agriculture and Agri-Food Canada Agriculture et Agroalimentaire Canada Canada

MINERAL OIL REPRESENTS A GOOD ALTERNATIVE IN NON-PERSISTENT VIRUS CONTROL

By Jacques Lavoie – Potato Development Specialist – Seed Production

There are two basic types of virus transmission, non-persistent (potato virus Y, A, S, M) and persistent or circulative (potato leafroll virus).

Non-persistent viruses

An aphid can pick up a non-persistent virus by probing a diseased plant for as little as 15 seconds. The aphid becomes a carrier (or vector) immediately and can infect other plants simply by probing their leaves. Even though the efficiency of virus spread decreases rapidly after acquisition, (the aphid retains the virus for only a few hours) the aphid is still able to spread the virus to several plants. This explains why insecticides have little to no effect on the control of the spread of potato virus Y (PVY). The time lapse between ingestion of an insecticide and aphid death is sufficient enough to enable an aphid to transmit a newly-acquired virus to one or more healthy plants after feeding on a diseased one.

Because insecticides do not work quickly enough, the recommendation to prevent non-persistent virus transmission is to spray mineral oil. The oil acts as a barrier to aphid probing by forming a film on the leaf surface and by settling into the intercellular spaces of the leaf. To be effective, the mineral oil must be present on the leaves before aphids arrive. Select nozzles that provide the best plant coverage and use the highest available pressure. Spraying must be done very early and on a continual basis to ensure adequate coverage. In New Brunswick, aphids arrive in mid-July; therefore, an oil spray before July 10th is normally not required. The protective effect of the oily deposit on the leaf surface lasts about 10 days. The oil that migrates inside the leaf has an inhibitory effect on vector transmission of PVY for five to six days. Weekly mineral oil applications are required to protect new foliage. Research has shown that it is possible to reduce non-persistent virus spread by as much as 80% with six applications of oil and 90% with nine applications at seven day intervals.

(Winged Green Peach Aphid photo courtesy of Potato Research Centre—AAFC)

Caution: *Oil sprays are not compatible with certain fungicides, such as Bravo (chlorothalonil), or copper. To avoid plant injury, the fungicide should be applied two days before or two days after the oil is applied.* **Never apply oil in full sun.**

As a rule, mineral oil sprays are used to protect potatoes grown for seed. Susceptible varieties that may benefit from a mineral oil spray are Russet Burbank, Red Pontiac, Russet Norkotah, CalWhite and Shepody, for example. Kennebec, Katahdin and Sebago are examples of varieties that are resistant to mosaic virus and may not require oil sprays.

The risk of a negative interaction with fungicides, the need for repeated applications and cost may limit the uptake of mineral oil sprays to control virus transmission. However, using insecticides and early topkilling to control virus spread do not appear to be sufficient in years when virus levels are high.

Topkill is recommended within 10 days of predicted significant flights of aphids – roughly the same time it takes a virus to reach the tubers following leaf infection. If topkill is not complete, subsequent new growth can effectively rejuvenate the plant and attract aphids. For effective PVY control, early top killing is essential since it reduces the risk of late virus infection and migration of the virus from the foliage to the tubers.

Persistent or Circulative Viruses

To acquire persistent or circulative viruses, like leafroll, an aphid must feed on an infected plant for an extended period of time. The aphid becomes infective after a latency period and is then infective for as long as it lives.

Leafroll can only be spread by aphids, with the green peach aphid (*Myzus persicae*) being the most efficient vector. Acquiring the virus from an infected plant and inoculating a healthy one normally requires several hours of feeding, and thus aphid control using an insecticide is an effective way to prevent spread of leafroll.

To reduce virus inoculum: plant clean seed, plant resistant varieties whenever possible, remove inoculum by roguing early in the season, control vectors and practice sanitization for pathogens transmitted by contact.

In combination with alternative control strategies such as: aphid traps to monitor aphid activity in your field, isolation, early planting, early topkill, early harvest, mineral oil, crop borders and proper training of staff on these principles.

Aphid Trap System

Aphid traps make it possible to better assess local situations and to find out which aphid species are present in potato fields. The traps, painted yellow on the inside to make them more attractive to aphids, are filled with water and a wetting agent to prevent aphids that land on the trap from flying away again.

The insects in each pan are counted and identified. After that, on the basis of the information accumulated over the years and the inoculum present in the field, the risk of virus transmission can be estimated and producers can be alerted to the need for roguing and more or less intensive treatments.

I would encourage all seed growers to participate in the aphid trap network that provides the producer with an overview of the aphid activity on their farms.

For further information on aphids or other seed potato related issues, contact Jacques Lavoie at the Potato Development Centre at 1-866-778-3762 or by e-mail at jacques.lavoie@gnb.ca.

Plant Breeders' Rights in Canada

By Andrew Sullivan—Plant Propagation Centre

(The following article will be the first in a series dealing with background on Plant Breeders' Rights (PBR) in Canada and the issues surrounding protected potato varieties).

The method that growers access new potato varieties has changed. In the past, a new variety would be released to growers at-large for commercialization. However, with the introduction of Plant Breeders' Rights (PBR) in the early 1990's, many breeders and high generation seed producers no longer release new varieties to the public for free. The intent of this article is to provide background on the information breeders and seed companies must provide to the PBR Office to have their variety protected. Future articles from different segments of the potato industry will focus on variety protection issues, how PBR affect the industry, and a discussion on future trends.

PBR legislation became law in 1990 and provided public and private breeders of many crops, including potatoes, the ability to seek protection for new varieties resulting from their breeding program. Once granted, variety protection lasts for 18 years. After that time has lapsed, the variety is no longer protected and it becomes a public (or free) variety.

A variety to be considered for protection must meet the following four requirements:

1) **New** - The variety must not have been sold in Canada before protection was sought. It can, however, have been sold outside Canada for up to four years. If the variety has been sold within Canada before protection was sought, then the seller has the right to lodge an objection to the PBR office.

(Photo of Plant Breeders Rights Office Website—see web address below)

2) **Distinct** – The variety must have characteristics that visibly distinguish it from all other known varieties currently in the registration system or those written about in publications.

3) **Uniform** – The variety must be uniform, such that any variance is foreseeable and can be easily described by the breeder. These variances must also be acceptable in the marketplace.

4) **Stable** – The variety must remain stable or unchanged over many generations. The distinguishing traits of plants produced from further generations must be the same as when protection was originally submitted.

Once these criteria have been met, the PBR process can proceed. Further steps include, but are not limited to, explanations on the role of an agent, application process, fees associated with different sections of the variety protection process, required documentation and enforcement that occurs if a variety is being used illegally. For a full description of requirements, go to the Plant Breeders' Rights website at: http://www.inspection.gc.ca/english/plaveg/pbrpov/pbrpove.shtml.

Once the site opens, select the *"Quick Pick by Commodity/Key Topic"* window, then scroll down to *"Plant Breeders' Rights"*, then click *"Go"*. On this website you will see the amount of paperwork, time, effort and costs required in order to protect a variety in Canada.

At the Plant Propagation Centre (PPC), where both public and protected varieties are housed in a repository, the implications of PBR requirements are evident. When a customer requests a public variety, the order is filled with no additional paperwork. When a customer requests a protected variety, the PPC requires an original signed letter from the breeder or agent, authorizing the release of their protected variety to the client requesting it. Without that authorization letter, the variety cannot be released. The same holds true when requesting protected varieties from any commercial seed grower.

This article provides a very basic overview of some of the requirements to obtaining PBR for new potato varieties. For more information about PBR, and the steps required to obtain it for new potato varieties, please visit the above link.

(Editor's note: The information in this article was provided from the Plant Breeders' Rights website listed above).

Plant Varieties Journal is Now On-Line

(The following notice was sent by the Plant Breeders' Rights Office with the April Issue of the Plant Varieties Journal)

Please note that this current issue of the *Plant Varieties Journal* (No. 59, April 2006) is the first to become available on-line. It is also the last issue that will be published and delivered by mail. The new on-line version of the Journal is available on the Plants Breeders' Rights website which can be accessed through the Canadian Food website at: *www.inspection.gc.ca*. Please select Plant Breeders' Rights under the "Quick Pick by Commodity/Key Topic" sub menu.

This online version provides easier access to the same information you have been accustomed to receiving in the past. As in the hard copy version, the information will be presented for specific varieties which are grouped by their crop kind common names. Those people who do not have access to the internet may request a printed copy of the Journal, similar to what is available on the internet site, by contacting:

Linda Tucker, Project Coordinator

E-mail: tuckerl@inspection.gc.ca

Telephone: (613) 221-7524

New Nouveau Brunswick CANADA

Agriculture, Fisheries and Aquaculture

Agriculture, Pêches et Aquaculture

Seed Pieces

Spud Cover Crops Go Deep

Agricultural Research Service— USDA
(Story taken from Agnet—May 9, 2006)

Deep-rooted cover crops can help potato farmers prevent erosion and protect groundwater by reducing nitrate leaching. That's one conclusion of Agricultural Research Service (ARS) scientists who developed several important tools and techniques to help growers manage their land economically and responsibly. Heavily fertilized crops with shallow roots, like potatoes, are more susceptible to nitrate leaching, according to Jorge Delgado, a soil scientist in the ARS Soil Plant Nutrient Research Unit at Fort Collins, Colo. However, nitrogen recovery can be significantly improved--and leaching minimized--by using a deep-rooted cover crop like winter rye, malting barley or winter wheat.

Deep-rooted cover crops reduce wind erosion, sequester carbon, cycle nutrients and draw nitrate further from the soil than crops with shallow roots. Crops like winter cover rye and wheat can even be used for grazing. Complementary potato research is being conducted in ARS labs at Prosser, Wash., and Orono, Maine.

In Prosser, scientists measured how much nitrogen Brassica cover crops contributed to the soil and how much was taken up by subsequent potato crops. Those studies found that about 30 percent of the nitrogen on the surface of the crop field was cycled back to the soil. Planting Brassica cover crops could save growers $15 to $20 per acre at current fertilizer prices.

Orono researchers modeled the influence of temperature on crop residue decomposition and nitrogen availability in order to predict the best time to apply additional fertilizer to meet the crop's needs and potentially reduce the amount of nitrate lost to groundwater. These efforts promote "precision conservation," or management practices that incorporate elements of conservation and precision agriculture.

Read more about the research in the May 2006 issue of Agricultural Research magazine, available online at:

http://www.ars.usda.gov/is/AR/archive/may06/potatoes0506.htm

ARS is the U.S. Department of Agriculture's (USDA) principal scientific research agency.

(Photo courtesy of Peter Scott—DAFA)

Potato Websites for this Issue

www.spudman.com

www.potatogrower.com

www.hortport.com

2006 DAFA Potato Cultivar Adaptation Trial

By Jacques Lavoie
Potato Development Specialist
Seed Production

Every potato market is unique, whether it is the culture of its people, their phytosanitary requirements or their climatic conditions.

To be successful in these export markets, we must consider the needs of farmers and consumers in the importing countries. Supplying varieties that are well-adapted to the importing country's growing conditions and local customs could help New Brunswick producers increase sales into these markets. For this reason, extensive field and storage testing is required in New Brunswick to assess the agronomic performance of new varieties that have the potential for export.

A new research project is underway to evaluate the performance of 13 russet, 18 chip, 15 yellow flesh and 10 tablestock varieties that include recent releases and promising clones from several breeding programs throughout North America. Each variety will be tested for a minimum of two years.

For further information on this trial, contact Jacques Lavoie at the Potato Development Centre at 1-866-778-3762 or by e-mail at jacques.lavoie@gnb.ca.

Published by: Department of Agriculture, Fisheries and Aquaculture

Questions?

Ideas for future articles?

Feel free to forward comments to the editor.

Andrew Sullivan, P. Ag.
Manager—Plant Propagation Centre
Agriculture, Fisheries and Aquaculture
PO Box 6000
Fredericton, NB E3B 5H1
1-866-778-3762
andrew.sullivan@gnb.ca