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

SeedBytes

April 2006
Volume 38, Issue 1

Welcome to the inaugural issue of SeedBytes! SeedBytes is provided by the Potato Development Centre of the Crop Development Branch.

Knowledge is power; it can be used to develop such things as advanced production techniques on individual farms, to acquire a better understanding of new emerging markets or to learn about new crop protection material registrations. The intent of SeedBytes is to provide current information to all New Brunswick seed potato producers. It will also showcase various services provided by various government organizations.

Technical information, new research projects and new advancements in seed production technology will be included in future issues. There will also be a section for current industry news and related articles of interest to the seed potato sector.

This edition focuses on the physiological age of seed, seed piece decay and methods to prevent it, as well as providing a report on the National Potato Council Seed Seminar held in Michigan last December.

Each issue will also feature examples of websites of potential interest to the seed potato sector.

With your feedback, SeedBytes will evolve to better suit your needs. If there are items of interest you would like discussed or questions answered, please feel free to contact the editor.

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

Only Foundation or higher seed allowed for planting in 2006

Discussions with the potato industry over the past three years concerning seed classes have led to an amendment of the *Potato Disease Eradication Act.* The **minimum** classification now required for seed potatoes planted in New Brunswick is (or equivalent to) FOUNDATION. This means that Certified class seed potatoes can not be planted in New Brunswick in 2006, either in commercial or home gardens.

Schedule A of the Regulation 82-70 under the *Potato Diseases Eradication Act* has been amended as follows:

1. Exclude seed potatoes of the class "Certified" from eligibility for planting in New Brunswick, whether produced in New Brunswick or another Canadian province;
2. Exclude seed potatoes produced in the United States that are equivalent to the class "Certified" from eligibility for planting in New Brunswick.

Potato Integrated Pest Management (IPM) Scouting School

Field scouting is a vital part of a farm's IPM program. Scouting involves systematically moving through fields looking for pests, measuring populations, and then using this information to make pest control decisions.

The Potato Development Centre is planning to offer a Potato IPM Scouting School on June 15, 2006. Information sessions will include presentations, videos, and hands-on activities on the identification of major potato diseases, insect pests and weeds, and on how to perform proper field scouting. Hands-on sprayer calibration workshop will take place in the afternoon. A free CD including pictures of potato diseases and insect pests will be available free of charge to all participants. Certified Crop Advisor (CCA) education units will also be available.

To register or for more information please contact Dr. Khalil Al-Mughrabi, Potato Development Centre, Wicklow at 1-866-778-3762 or e-mail *khalil.al-mughrabi@gnb.ca.*

Pest Management Guide for 2006 (Publication 1300A)

With several label and product updates providing comprehensive pest management tools for NB potato producers, the Department will, shortly, be releasing the **Potato Crop Guide: Weed and Pest Control Guide 2006**. The guide will contain information on current label rates and application timing of pesticides registered for use on potatoes in Atlantic Canada.

Physiological age—what to look for in your seed lot

By Dr. Loretta Mikitzel—Potato Development Specialist - Physiology

A quality potato crop starts with quality seed.

You've heard it more than once - for maximum crop performance, plant only disease-free seed of the proper physiological age. With the help of inspections, certification and post- harvest tests, figuring out the disease-free part is relatively straight forward. But, you cannot tell the physiological age of a seed lot just by looking at it – seed potatoes hide their age very well.

The importance of physiological age relates to how the crop will develop and yield.

Physiological age encompasses both chronological age (measured in months) and past production and storage conditions that affect productivity. Seed potatoes that were produced during hot, dry years, or senesced early due to pests, nutrients or frost, will be older than tubers grown under more moderate conditions. High or fluctuating storage temperatures and pre-cutting tubers into pieces also advance seed tuber physiological age.

Compared with young seed, physiologically older seed will sprout and emerge faster, produce more stems and tubers per plant, senesce earlier and produce smaller-sized tubers. Planting very young seed may not always be the best choice. In short growing season locations, seed that is physiologically older will perform better. The ideal seed age range depends upon cultivar and end-use of the crop.

(Physiologically old tuber photo courtesy of Dr. Loretta Mikitzel—NBDAFA)

Cultivars that produce very few stems, and subsequently few tubers per plant (such as Shepody), and cultivars with strong apical dominance (Atlantic), long dormancy and/or the tendency to sprout erratically (Yukon Gold) may all benefit from planting slightly aged seed. If a smaller tuber size profile is desired for seed production or specialty fresh market, the seed may need to be aged. Early varieties, such as Russet Norkotah, do not benefit from seed aging.

The importance of physiological age relates to how the crop will develop and yield.

So what is too young and what is too old? Young seed will just be awakening from dormancy at planting, probably stored at a constant low temperature and warmed for the bare minimum amount of time before planting. These young tubers will emerge very slowly and produce only about one stem per plant. Seed that is too old is well past dormancy with all eyes producing multiple or branched sprouts. Seed can become excessively aged by being desprouted several times, for example. Extremely young and extremely old seed do not perform to maximum potential and should be avoided.

(Sprout photo courtesy of Dr. Loretta Mikitzel—NBDAFA)

How do you obtain seed of the ideal physiological age range? To estimate the physiological age of a seed lot, knowing about the seed growing and storage environments is a good start. A close relationship with the seed supplier will help here. If the conditions are unknown, assume the age to be intermediate, not too old or young.

Since there is no test available for measuring physiological age, observing sprout growth prior to planting will give a rough idea of seed lot age. Place a small tuber sample (5-10 kg) at room temperature in the dark. Note how long it takes for sprouts to appear and how the sprouts are distributed on the tuber. One single robust sprout from the apical end indicates young seed. Sprouts appearing quickly from several eyes on the tuber are a sign of physiologically older seed. If the seed is young, it may be warmed to 10°C for several weeks before planting to age it slightly. If the seed is physiologically aged, avoid temperatures that will age it further. In general, if the previous growing season was not unusual, seed lots planted in New Brunswick are within the acceptable range of physiological age for cultivar and end use.

For more information on physiological aging, see the following fact sheet:

http://www.gnb.ca/0029/00290002-e.asp

For any other questions on physiological aging, feel free to contact Dr. Loretta Mikitzel at the Potato Development Centre, Wicklow at 1-866-778-3762 or *loretta.mikitzel@gnb.ca.*

Seed Piece Decay

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

Seed piece decay is caused by several factors such as planting infected seed, small seed pieces, or seed planted too deep or in cold, wet soil. Pathogens often associated with plant misses are *Fusarium* spp., *Rhizoctonia solani*, *Erwinia carotovora* and *Pythium* spp. Gaps, missing hills or delayed emergence may have little effect on the crop but misses that exceed 10% of the planted seed will have serious consequences on the yield, quality (size and shape) and disease levels in the harvested crop.

The most effective way to reduce seed piece decay in the field is through preventive management practices such as:

1. Plant clean, disease-free seed.

2. Before bringing seed onto a farm, all machinery, cutting knives and equipment should be disinfected.

3. Grade the seed to eliminate any tubers that have broken down over the winter months.

4. Warm seed to approximately 10-15 ˚C for one to two weeks before cutting.

5. Cut "blocky" seed pieces about 43g to 57 g (1.5 to 2.0 ounces) in weight.

6. Seed treatments (see table below) can sometimes help emergence, protecting the cut surface from certain soil pathogens. Always read product labels before use. Fungicidal seed treatments are no substitute for healthy, properly handled seed.

(Photo of diseased seed piece courtesy of Dr. Khalil Al-Mughrabi—NBDAFA)

7. Planting in cool, wet, compacted soil can lead to slow emergence and poor stands. Plant seed in well-drained soils when soil temperature is above 7°C. Avoid planting seed too deep.

RESISTANCE MANAGEMENT: Do not use Senator PSPT if Mertect has been used as a post harvest fungicide. Do not use Maxim PSP in any two consecutive seed generations.

For chemical control and other guidelines, please refer to the recent issue of the Potato Crop, Variety, Weed and Pest Control Guide for New Brunswick. For more information on this topic visit http://www.gnb.ca/0029/00290029-e.asp.

For any other questions on seed piece decay, feel free to contact Dr. Khalil Al-Mughrabi at the Potato Development Centre, Wicklow at 1-866-778-3762 or *khalil.al-mughrabi@gnb.ca.*

Potato Seed Piece Treatment Fungicides Registered for Use in 2006

Products

Trade Name	Active Ingredients	Formulation	Product/100 Kg of Seed
Maxim MZ PSP	Fludioxonil (0.5%) + mancozeb (5.7%)	Dust	0.5 kg
Maxim PSP	Fludioxonil (0.5%)	Dust	0.5 kg
MancoPlus	Mancozeb 16%	Dust	0.5 kg
Potato ST 16	Mancozeb 16%	Dust	0.5 kg
Tuberseal	Mancozeb 16% + Douglas Fir Bark	Dust	0.5 kg
Polyram 16D	Metiram 16%	Dust	0.45-0.65 kg
Senator PSPT	Thiophanate-methyl 10%	Dust	0.5 kg
Penncozeb 80 WP	Mancozeb 80%	Wettable Powder	0.1 kg

Roguing School —2006

Once again in early June, the New Brunswick Department of Agriculture, Fisheries and Aquaculture (NBDAFA) will be sponsoring roguing schools at the Potato Development Centre in Wicklow and at the Grand Falls Regional Office. This is an excellent learning opportunity for both you and your farm staff. The course includes a classroom presentation, followed by an invitation to visit our outside plots, where Canadian Food Inspection Agency (CFIA) inspectors provide you with actual hands on experience. They will assist you in identifying common varieties, variety mixtures and virus diseases. Questions are always welcomed.

For more information on the exact dates and times for the roguing school in your area, contact Janet McLaughlin or Jacques Lavoie at the Potato Development Centre, Wicklow at 1-866-778-3762 or *janet.mclaughlin@gnb.ca.*

Seed Pieces

(This section will be devoted to new ideas, innovations and research useful to seed producers)

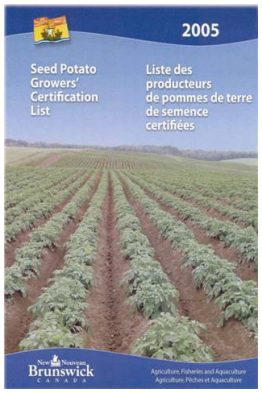
2005 National Potato Council Seed Seminar Report

by Andrew Sullivan—Plant Propagation Centre

The 2005 version of this North American seed potato conference was held in Dearborn, Michigan in early December. Although the conference is hosted by the National Potato Council in the United States, it truly is a North American seed potato conference. Many representatives from the Canadian seed potato industry consider it the "must attend" event. The Seed Seminar coincides with the release of seed potato directories across North America, including the New Brunswick seed directory. These directories are the main attraction for many who visit the various tradeshow booths.

The two day conference showcases speakers specializing in research that directly pertains to the seed potato industry. Presentations this year included topics on the importance of the potato gene bank in breeding programs, an overview of new and upcoming variety releases in North America, and pre-planting potato seed piece management.

A very informative, and particularly troubling presentation was given by Dr. Stewart Gray of Cornell University. Dr. Gray spoke on the increased prevalence of both common and necrotic strains of PVY in North America. Dr. Gray, and many others in the industry, attribute the rise in PVY incidence to potato varieties that do not exhibit symptoms once infected with PVY. These symptomless varieties, such as Russet Norkotah, Cal-White, and Shepody to a certain extent, cause increased amounts of inoculum to be present in seed and commercial fields across Canada and the United States. The introduction and detection of the necrotic strains of PVY is also a concern for seed potato producers.



Dr. Christina DiFonzo, Entomologist at Michigan State University, provided an interesting presentation on the effects that heightened aphid populations can have on a potato crop. For example, in two out of the past five years, soybean aphid levels have been high in the Midwestern United States and central Canada. Although these aphids are not a primary pest of potatoes, if present in high numbers, they can cause significant spread of non persistent viruses, such as PVY.

For further information on the National Potato Council Seed Seminar, or on any of these presentations, feel free to contact Andrew anytime at 1-866-778-3762 or *andrew.sullivan@gnb.ca.*

Transforming Tubers

(*Article written by Stephanie Fehr for Spring 2006 issue of SpudSmart)*

Potato producers have been feeling a squeeze on potato prices recently. While work has been done to curb oversupply and stimulate demand, there have also been people looking into the viability of using potatoes for other uses besides process or tablestock, thus increasing their value.

Kevin Shiell works at the Centre of Excellence in Agricultural and Biotechnological Sciences in Grand Falls, New Brunswick, and is trying to find economically viable new uses for potatoes. He's done some work in co-operation with Washington State University to make lactic acid out of spuds.

The starch in potatoes can be transformed into glucose with the use of bacteria, fungi, or microorganisms. One of the byproducts of this process is lactic acid, says Shiell. Lactic acid has uses in food as a flavour additive and food preservative. While Shiell says these are important uses, "the real potential may be in biodegradable plastics." One major company, Cargill Dow's NatureWorks, is already turning lactic acid into polylactic plastic, which is biodegradable.

Shiell says this creates some interesting marketing possibilities. If a fry manufacturer were to package their french fries in a bag made out of polylactic plastic, you would essentially have a product that is completely made out of potatoes.

Shiell has also looked into the viability of producing ethanol from potatoes. While this is a possibility, you would need about six times the amount of potatoes as you need corn to make ethanol. However, by using the grain grown in between the potato rotation, you could create a more economical ethanol blend. Shiell says an ethanol plant may be an option in the future, but would be a challenge to maintain right now. "If the price of oil breaks $100 a barrel, producing ethanol out of potatoes may be another option for cull potatoes."

One of the areas of research that Shiell is interested in is finding out the nutritional composition of the tubers. "We don't know a lot about the chemistry of potatoes – nobody's actually taken the potato and analyzed it chemically," says Shiell. "We know there is starch in them and protein in the skin, but we don't know all the possible products we could make chemically out of potatoes," says Shiell. "So that's definitely something we're eager to learn."

The future is wide open when it comes to new uses for potatoes.

This Issues Potato Websites

www.potatonews.com www.potatoreporteronline.com www.spudsmart.com