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SeedBytes

A quarterly newsletter produced for the New Brunswick Seed Potato Industry

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2010 NBSPGA Annual Meeting

By Shaun Pelkey–Bon Accord Elite Seed Potato Centre

The Annual Meeting of the New Brunswick Seed Potato Growers Association (NBSPGA) was held Tuesday March 23, 2010 in Perth-Andover. The industry was well represented with 47 New Brunswick seed growers in attendance.

Presentations during the Annual Meeting included:

- **Product Presentation by Syngenta**– Fern Rioux provided background information on Syngenta and product updates for Revus® and Allegro® fungicides. Look for a drop in price for Allegro® this coming year. (We also thank Syngenta for co-sponsoring supper).
- **PEI Virus Management Program**– Mary Kay Sonier, Seed Coordinator with the PEI Potato Board, provided an overview on the current PEI Virus Management Program. Important points about the program are: mandatory Post Harvest Test (PHT) for all seed planted in PEI, the producers pay for all testing, tuber samples are collected by producers under the supervision of a provincial inspector, and PEI currently has a set cap of 6% for PVY and 2% for PLRV. To ensure producers comply with the planting protocols, documentation on acreage planted, seed source and virus readings is verified on 20 randomly-selected producer operations.
- **Potato Virus Y (PVY) Science and Management**– Dr. Robert Coffin, Privar Farm, Inc., PEI, gave an excellent presentation on PVY & PLRV. Dr. Coffin touched on results from this year's PHT done at accredited laboratories. These laboratories maintain a very stringent testing protocols which leave very little chance for error. The two main PHT techniques currently used are ELISA and RT-PCR. Management practices which help reduce PVY levels include: removing inoculums early in the season, surrounding seed fields with border crops, applying oil sprays, and aphicides. Dr. Coffin continues to research PVY in PEI.
- **Proposed Mandatory PVY Monitoring & Management in NB in 2010**– Robert Gareau and Joe Brennan of Potatoes NB indicated PNB plans to implement a registration program this spring to document seed lots planted, acreages and PHT readings, if available.
- **PVY Strain Differentiation**– Dr. X. Nie, Agriculture and Agri-Food Canada, Fredericton, gave a brief presentation on the many different strains of PVY; namely, PVY^{O}, PVY^{N}, PVY^{NTN}, $PVY^{N:O}$, and PVY^{C} . Dr. Nie emphasized the complexity of the PVY organism.
- **NBDAA involvement in PVY Management in NB**– Brian DuPlessis, NBDAA, informed growers the department will work closely with industry to help find solutions to the PVY situation. Mr. DuPlessis thanked NBDAA staff as well as PNB, for organizing the PVY Workshops held in Wicklow and Grand Falls in late February. Dr. Khalil Al-Mughrabi, NBDAA, also presented growers with a PVY factsheet. Mr. DuPlessis hopes to have the revisions of Regulation 82-70 under the Potato Disease Eradication Act in place by July, 2010.
- **NB Seed in Cuba, new varieties**– Jacques Lavioe, NBDAA, provided an overview of the different potato varieties being evaluated in Cuba this year. NBDAA has trialed numerous varieties over the past few years to determine their suitability under Cuban growing conditions. For further information on the varieties and results, contact Jacques at Jacques.Lavoie@gnb.ca or at (506) 392-5199.

Inside this issue

Upcoming Events

NBIA Annual General Meeting April 16th, 2010 Quality Inn Prés du Lac, Grand Falls

Potato Roguing School will be held in late June/early July. For more information, please contact Janet McLaughlin or Jacques Lavoie at 1-866-778-3762.

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 Shaun Pelkey at shaun.pelkey@gnb.ca or 1-866-778-3762.

Border crop and mineral oil sprays combine to reduce PVY incidence in the seed potato crop

Dr. Gilles Boiteau—Entomologist—AAFC Fredericton

A New Brunswick research project conducted between 2004 and 2006 demonstrated that the combination of mineral oil sprays and border crops provides higher reduction of PVY infection year after year than the use of either method alone.

The ineffectiveness of insecticides at preventing the spread of aphid vectored potato virus Y (PVY) leaves potato growers with a limited number of control strategies that include mineral oil films and border crops.

The effectiveness of mineral oil sprays at reducing PVY incidence in seed potatoes was discovered in 1962 by Dr. R.H. Bradley at the Potato Research Centre of Agriculture and Agri-Food Canada (AAFC) in Fredericton. The control method is now part of seed potato (and many other crops) protection practices in Europe and is used by many Canadian producers.

Planting a few rows of a different crop as a border crop around seed potato fields helps protect the seed potato crop from PVY spread. This concept was introduced by researchers from the University of Minnesota in the mid 1990's. The aphid carriers landing on the border crop lose their virus charge while probing, thus reducing their potential to transmit the disease to the adjacent seed potato crop The acquisition and inoculation of non-persistent viruses occur in seconds and infectivity of the vectors can be lost after one to several exploratory probes as aphids search for suitable feeding sites after landing on the border crop.

The effectiveness of each method on their own can be very high but varies between years and between locations for reasons that are poorly understood. A project was developed between the Potato Research Centre, Agricultural Certification Services (Potatoes New Brunswick), and the New Brunswick Department of Agriculture and Aquaculture with the support of Canada\New Brunswick Science and Innovation Program to determine if the level of PVY reduction provided by border crops or oil films alone could be improved by combining their use. The objective was to compare PVY spread in various combinations of field plots: plots receiving oil sprays with fallow borders, plots with crop borders and no oil sprays, plots with a combination of oil spray and crop borders, and a check plot with fallow border and no oil sprays. Check plots left unprotected reached mean PVY incidence levels of 21.4, 7.8 and 3.3% in 2004, 2005 and 2006, respectively.

Results confirmed the substantial year to year variation in the effectiveness of crop borders or oil sprays used separately. However, plots protected with the combination of border crops and oil sprays exhibited better or equal PVY reduction than either alone each year of the trial. The contribution of the oil spray to the overall level of PVY reduction in the seed potato plot was the same whether it was applied to the border, the center plot or both. Based on this, the application of the oil can be limited to the border crop, reducing its cost and helping to compensate for the additional costs of integrating two control methods

Management of aphid vectored diseases is complex. Many crops can be used as borders. In this project, a 4 row wide border of potatoes cv Kennebec was planted around the main crop (cv Shepody). It is critical that the border crop be as virus free as possible at planting so that it does not become a source of infection for the main crop. Potato borders are more likely to have virus infection and will probably have to be harvested separately.

Winged aphids from outside the fields are largely responsible for PVY transmission. Aphids are attracted to green potato plant/dark cultivated soil edges of the seed potato fields. Insecticides cannot kill immigrating winged aphids quickly enough to prevent PVY acquisition and inoculation. However, aphids carrying PVY that land on the oil sprayed crop border of a seed potato field may lose the virus as they test feed on the border or as the stylets penetrate through the oil film. In the project, the combination border and oil provided the best reduction in the incidence of PVY every year, providing growers with one more tool in the IPM tool box!

Agricultural Insurance Update

Mark Carpenter - Crop Insurance

Agricultural Insurance (commonly referred to as Crop Insurance) is a valuable Risk Management tool available to potato producers throughout New Brunswick. It helps to protect them against losses beyond their control, such as excessive moisture, drought, frost, snow, wind, hail and unavoidable damage from insects and plant disease.

The 2010 Crop Insurance Policy for Potatoes remains relatively unchanged from 2009. Seed potato producers can choose between two options, Production by Group or Production by Seed Potato Variety (SVI). Coverage levels of 60%, 70%, 80% or 90% are available for the Production by Group, option while producers are limited to 70% or 80% coverage if they choose SVI. The unit price for seed potatoes remains the same with a maximum of $9.50 /cwt.

Crop insurance expanded its potato policy in 2009 to include spot loss coverage for potatoes infected with late blight. The intent was to encourage producers to kill infected areas early to prevent the spread of late blight to surrounding fields. Spot loss coverage was successful with a number of producers participating and will be included in the policy again for 2010.

One change for the upcoming year is the removal of yield trend adjustment factors from the probable yield calculations. The Commission recalculated the trend adjustment factors and determined they were no longer relevant as actual yields, without adjustment, now accurately reflect a producer's current production potentials. Therefore, probable yields for 2010 will simply be a 10-year average of individual yields adjusted for quality. Provincial benchmark yields for seed potatoes will see a slight decrease; however, the affect on individual producers' probable yields will vary depending upon their production history.

The past few growing seasons were challenging for many potato producers in New Brunswick resulting in higher than normal crop insurance payouts which have had a direct affect on premium rates.

(continued on page 3)

PVY FACTSHEET

By- Dr. Khalil I. Al-Mughrabi, Potato Pathologist, NBDAA

MANAGEMENT OF POTATO VIRUS Y (PVY)

Potato virus Y (PVY) is one of the most damaging potato viruses. It can cause mosaic on potato leaves and affect yield and quality. Yield losses range from 10% to 80%. Affected tubers are unusable for propagation. Late season virus transmission by aphids is difficult to detect in field inspections as they seldom produce recognizable symptoms. There are several different types of PVY, including PVY^{O}, PVY^{N}, PVY^{C} and PVY^{NTN}. PVY^{O} is the common strain of PVY. Symptoms in potato vary widely with the virus strain and the cultivar, ranging from extremely mild mosaic to severe foliar necrosis to death of infected plants. The main sources of infection from the virus are infected seed and infected volunteer plants. Green Peach Aphids and other aphid species can also transmit the virus. Spread of PVY by aphids is in a non-persistent manner (stylet-borne). If aphids' populations are large, PVY spread can be very extensive. Younger plants are more easily infected than older ones. Time required for virus translocation to the tuber is shorter in younger plants. Time required for aphids to acquire and transmit PVY is very short (seconds or minutes), so insecticides cannot act rapidly enough to kill the aphid before the virus is transmitted. Since acquisition and inoculation occur very quickly, aphids do not need to colonize potatoes to transmit PVY. They can come from other crops, shrubs, weeds, etc.

DISEASE MANAGEMENT

- Use disease-free seed. Field reading and post-harvest test results may be used as guides to select seed lots with low virus levels.
- Plant resistant cultivars if possible.
- Properly destroy cull piles according to established guidelines.
- Rogue early in the season to remove infected plants from the field.
- Use mineral oils.
- Use insecticides to prevent the population of aphids from increasing within a field.
- All cutting and planting equipment should be disinfected before coming in contact with seed.
- Minimize mechanical damage of plants during cultivation and spraying.
- Minimize visitor entry into potato fields.
- Avoid planting seed potatoes downwind from commercial fields.
- Control volunteer potato plants and weeds (wild rose, wild mustard, wild radish are hosts for aphids on which large populations can develop).
- Top-kill seed fields early to prevent late-season virus infection.
- Avoid planting susceptible varieties in close proximity to fields with varieties which have poor symptom expression.
- Crop Barriers consist of a non-PVY host crop planted around small early-generation seed lots to provide a buffer between the seed lot and the in-flight of aphids (*e.g.* cereals). Aphids usually land at the interface between fallow ground and green crop.

Agricultural Insurance Update (continued from page 2)

While individual premiums will vary from producer to producer depending upon their individual production and financial history, the base premium rates for seed potatoes will see only a marginal increase for 2010.

The Agricultural Insurance application deadline for potatoes is May 1, 2010. Agricultural Insurance is also available for small grains, grain corn, soybeans, canola, apples, blueberries, strawberries, processing carrots, sweet corn and fresh market vegetables.

Knobby Tubers – where they come from and how to prevent them

By Dr. Loretta Mikitzel Potato Development Specialist–Physiology

Knobby tubers (also called rough tubers) are the result of a physiological disorder, not disease or insects. There are no foliage symptoms and internally the potato is normal. Knobs form due to lateral growth from one or more eyes on the potato. The degree of knobbiness varies from protruding eyes to knobs large enough to be small tubers. Knobby potatoes are considered culls and are unmarketable.

Knobs are caused by uneven growth of the potato. During a period of stress, tuber growth slows or may even stop. When favorable growing conditions return, tuber growth resumes. When growth resumes, it is not uniform throughout the potato and one or more knobs are formed. Knob size and shape vary depending upon stage of tuber growth when the stress occurs. Stress or unfavourable conditions can be high soil temperature, high air temperature, moisture stress or lack of rain, fertilizer imbalance or sudden damage to the canopy, such as from hail or defoliation due to insects or disease. Knobs may form, for example, if there is a sudden hot spell followed by moderate temperatures. Moisture stress is not necessary for knobs to form.

Some varieties are more susceptible to knob formation than others. Long tubers such as Russet Burbank are more likely to get knobs than round varieties. However, no variety is completely free of knobs.

Although weather is the primary reason knobs form, other factors may increase the likelihood of knobs. Situations that result in reduced tuber numbers per plant contribute to knobby potato formation. These include poor plant stand, single-stem plants, Rhizoctonia infection, small seed size or the wrong seed size for the seed's physiological age. When there are few tubers in a hill for any of the above reasons, each tuber has ample room to grow and will size up quickly, getting large and knobby.

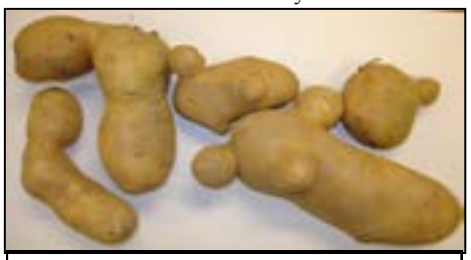

Figure 1: Knobby Shepody Tubers

Improper fertility level, such as excess nitrogen or improper fertilizer placement, can also lead to knobs. Finally, excessive vine growth can also promote knob formation. Large photosynthetic capacity means lots of carbohydrates can be produced and fed to tubers making them grow large.

Knobbiness and hollow heart often occur together because the conditions that cause knobs are the same that promote hollow heart formation.

Consistent favourable growing conditions are the key to reducing knob formation. We cannot control the weather or produce rain on demand, but we can reduce the likelihood of knobs with good cultural practices.

1. **Strive for a uniform plant stand**

- Use the correct spacing (calibrate the planter and monitor planting accuracy).
- Avoid skips and doubles, operate the planter at the correct speed.
- Practice good seed handling to reduce seed piece decay—warm seed before cutting to avoid bruising, disinfect cutting knives often, if storing cut seed make the pile no more than 6 feet tall with adequate ventilation, use an appropriate seed piece treatment, make sure soil and seed piece temperatures are compatible at planting.

2. **Use the correct seed size**

- Cut the seed to the size that will produce the desired stem and tuber numbers for the end use of the crop.
- Cut the seed to a uniform size and shape to improve planter efficiency.
- Undersized seed pieces less than $1^{1/2}$ to 2 ounces (42grams) perform poorly. Target seed piece size is $1^{1/2}$ to 2 ounces (42 to 56 grams).
- Consider the physiological age of seed.

3. **Use balanced fertility**

- Avoid excessive nitrogen that promotes lush top growth.

It is thought that some Russet Burbank clones are more prone to knobbiness than others. Research conducted in New Brunswick over several years with ten different Russet Burbank clones from across Canada and the United States determined that growing season (weather and cultural practices) influenced knobbiness more that which clone was grown. The production of a consistently large number of knobby potatoes over many growing seasons indicates the variety is not suited to that environment.

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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.