

Notes from 2017 Potato Conferences

Ryan Barrett, PEI Potato Board Research Coordinator and AIM Project Lead

NB Potato Conference – February 2017

I was over at the NB Potato Conference yesterday, and I thought it might be valuable to pass along a few highlights of some of the presentations. I thought it was a good agenda, with some very interesting results. If there is a particular presentation you'd like to see more of, I can ask about getting copies.

Athyna Cambouris, AAFC Quebec City: Soil Variability

- Doing work in QC, NB and PEI on electroconductivity and soil spatial conductivity
- Presented results from some preliminary work done in NB
- Matching up soil electroconductivity (EC) with yield maps, soil sampling
- Use of ground penetrating radar (GPR) was not very useful in making management zones.

Bernie Zebarth, AAFC Fredericton and Tom Dixon, McCains: Drone Imagery

- Tom went over some of the challenges they have had in using drone-mounted cameras to image fields and then use those images to try and predict yield or assess in-field variability.
- Lots of growing pains in getting cameras to function properly, getting images to line up, working with resulting data
- Did get some useable data in 2016
- Bernie talked about how drones are being used in other places in the world
- Gave example of iPot project in Belgium, where every potato field is supposed to be regularly imaged from the air, feeding data into a crop growth model
- Talked about using WDWI_green as a preferred alternative to NDVI for potatoes, and ongoing research to try and use this imaging to predict tuber yield

John Walsh, McCains: CIPC exposure on seed

- Very good short presentation on delayed emergence that they are seeing from seed that has been stored or handled/cut in storages where CIPC has been used in the past.
- Even very low rates like 0.025 ppm can affect emergence and yield
- Saw up to 16% yield decreases due to CIPC effects
- Recommendation to store seed in storages that have not had CIPC used. If it has, intensive steam cleaning has been shown to help, but may not get rid of 100% in the first couple of years.
- Even cutting and storing for a short amount of time in a building that has seen CIPC use can have an effect.

Gilles Moreau, McCains: NB Initiative projects

- In-Furrow Decompaction: tilling between the rows at a depth of 8 inches, 2 weeks after planting with a one-pass hiller with heavy duty S tines.
- Did not see a yield improvement in 2016
- One field did great in 2014, no improvement (sometimes negative) since
- Might be more beneficial in heavier soils

- Compost: application of 3 consecutive years of 25 T/ac of compost (chicken manure + wood waste)
- Showed an improvement in soil moisture levels without an increase in soil temperature
- Average improvement in marketable yield of 15 cwt/acre. Not much improvement in gross yields, but some improvement in payables (hollow heart)
- No ROI in short term, but might see residual effect for 8-10 years. No economics shared.

- Nurse Crops: seeding a grain crop on the day of potato planting to improve water holding capacity and reduce erosion before potato emergence.
- Third year of trials, mix of sites where incorporation was done green or where nurse crop was desiccated and then incorporated.
- When incorporated green, there was often a slight yield reduction. Where it was desiccated and incorporated (12 to 18 days after planting) there was a 20 to 30 cwt/acre yield improvement.
- Recommendation not to incorporate green, but some justification to desiccate and incorporate....possibly just to desiccate.
- Best results in lightest soils, barley preferred over rye or oats.
- Cost approx. \$50/acre

Mathuresh Singh, Potatoes NB: PVY

- Review of the results gained from several years of PVY research. Much of this has been shared before.
- Take home message: NB has reduced the amount of lots with over 4% PVY from 20.5% in 2012 to 1.1% in 2016, with over 70% of lots coming back clear.
- Use of oil + insecticide repeatedly proven to be most effective at combatting PVY spread.
- Work in last 2 years has shown that there is twice as much PVY spread in the tractor rows, likely due to mechanical transmission. It is thought that the next recombinant PVY strains are more likely to be spread by mechanical transmission. More work to be done on this, but it leads to the recommendation to ensure that tractor rows are rogued first and aggressively. For early gen seed, it might justify use of tramlines (Ryan's thought).

Matt Porter, Maine grower: Data Driven Ag

- Gave a grower perspective on use of precision ag tools on their farm. Very well spoken
- 1000 ac potatoes, 3000 ac grains
- Yield monitors on potato harvester and combine
- Emphasized use of smoothed maps from yield monitors and grid sampling for use in variable rate application

- Moving to zone sampling for soil sample instead of grid sampling
- Using variable rate fertilizer in spreader as well as now on planter through liquid application of P.
- Also first year of variable rate seed spacing...something to dig into more.

Jesse Chaisson, NB Dept of Ag: Mustard

- Jesse used to work with Cavendish Research Farm
- Gave overview presentation on using mustard as a biofumigant that was very good.
- Glucosinates produced by mustard have two atoms of Sulphur, so essential to have Sulphur in fertilizer mix
- His recommendation for fertilizing a single crop of mustard (Caliente) is 75 lbs N and 12.5 lbs S per acre.
- Don't need to use P and K, as there is enough in the soil and you are putting the mustard back in as a green crop.
- Mustard will have limited effectiveness at pH lower than 5.5. More effective closer to neutral
- Incorporate mustard at 60% bloom, when soil is somewhat moist. Flail chopping immediately before incorporation is best.

Loretta Mikitzel, NB Dept of Ag: Seed Trials

- Apical vs. basal end seed piece trial: looked at difference in emergence and yield on lots that were all apical end pieces vs. basal end pieces vs mix vs those cut lengthwise
- Basal end pieces did show some delay in emergence, had fewer tubers per plant, and had larger tuber size.
- While differences weren't statistically significant, there was a definite spread in crop value with apical seed pieces producing up to \$700 more per acre. However, it comes down to what do you do with this information. Possibly a rationale for whole seed (reduced cutting)
- 1,4 SEED trial: Using 1,4SEED treatment to allow seed warming before planting without sprouting.
- Compared treating and warming at 10 C for 60 days before planting compared to holding at 4 C ahead of planting.
- Use of 20 ppm was sufficient to stop sprouting during warming.
- Did not result in much increase in yield, but did increase tuber numbers with a smaller size profile. Might be quite useful for seed production (similar to ethylene that we've been discussing).
- Product currently available.
- Early vs. late planting: comparing seed planted on May 21st versus planted on June 15. However, seed was started warming at the same time (May 5) and the late planted seed was desprouted before planting.
- Both were killed Sept 5, harvested Sept 21
- Over 100 cwt difference in marketable yield, with the early planted being the best, also with higher tuber numbers

Khalil Al-Mughabi, NB Dept of Ag: Vert/Nematode Survey and Dickeya

- Surveyed 160 fields (all crops) in 2016
- 60% of samples had nematodes over 1000/g of soil (threshold for Superior)
- 30% of samples over 2000 (threshold for Russet Burbank)
- Highest nematode counts surprisingly in corn and soybean fields, then potato
- 61% of fields positive for *Verticillium dahliae*
- 18% of field over the threshold (10 cells/g soil)
- 30% of fields were over the threshold for Vert and Nematodes
- Limited study of fields with chloropicrin use showed high effectiveness on nematodes, possibly a bit less on Vert but still a reduction
- Planning a study of 50 potato fields in NB in 2017, as well as evaluating use of mustard and new products (Aprovia, Velum Prime). May be potential to do in PEI as well (Bernie Zebarth)
- Dickeya: No fields turned down for blackleg in NB last year.

Wisconsin Potato Growers Conference – February 2017

Here are a few highlights from the Wisconsin Potato Growers Conference I attended last week. There were some really strong presentations on a number of topics of mutual interest. If there is a specific topic that you have more questions on, I have proceedings of the conference on a jump-drive that I can forward (PDF).

Water access and regulation:

- Wisconsin is seeing increased regulation in the access to water for irrigation, with new permitting and assessments on high capacity wells.
- Approx. 35% of total water use in the state goes to irrigation, with the main potato growing region (Central Sands) dependent on irrigation.
- There are currently more than 13,000 high capacity wells in use in the state (compared to less than 100 in PEI)
- There is an increased emphasis on measuring groundwater use, measuring recharge rates, and strengthening regulations
- There is currently no plans to change nitrate concentration regulations (same as PEI), but about 10% of private well tests are at or above the limit
- Research has shown that planting fall cover crops can decrease nitrate leaching in the fall by up to 77%

Potato Breeding

- www.potatovirus.com – website with listing of virus susceptibility by variety
- Cornell is working on variety resistance to necrotic viruses (mop top, tobacco rattle)

- Have identified a single gene which has “super resistance” to PVY. Working on adding this gene in all future crosses
- A challenge is necrotic strains of PVY which don’t show traditional PVY mosaic symptoms
- David Douches from Michigan State talked about new focus on diploid breeding techniques in their program.
- Biggest breakthrough has been development of “self-compatibility” genes to self-pollinate and stack genes of interest
- Trying to stack up to 6 disease resistance genes in current crosses
- Jeff Endelman from UW-Madison talked about current developments in breeding
- There is a changing regulatory atmosphere in the USA on “gene editing” as opposed to “genetic modification” through traditional means
- Company Calyxt has developed new potato varieties with some similar benefits as Innate varieties but done through new gene editing techniques, and are not regulated by USDA
- Right now there is a dichotomy in US breeding. Private breeders are mostly modifying traditional varieties with GE techniques. Public breeders are mostly avoiding GE breeding techniques, raising questions on whether they are developing varieties needed by the industry
- In Jan 2017, USDA announced proposed changes to regulations for genetic modification. Currently in a 120 comment period, but could lead to making it easier to use new techniques without having to go through extended regulatory pathway
- There has also been changes in how food products have to be labelled in the future. Currently in a 2 year process to come up with final rule, but will supercede state laws (like current Vermont law)
- UW-Madison has developed a chipping variety called Hodag which has shown good common scab resistance as well as long term storage potential.

Remote Sensing Technology

- Increasing use of hyperspectral remote sensing which allows us to use non-visible wavelengths to identify variations in foliage (NDVI)
- Increasing use of orbital satellite imaging, with some satellites imaging the same area once a day
- One challenge with NDVI is making sure that maps can be compared across different dates and different fields by accounting for cloud coverage, white balance, etc.
- Orbital imaging research is starting to result in large scale (big data) crop yield prediction across multiple crops by region/country
- There is increasing potential to do NDVI measurement mounted on tractors, to allow for imaging when doing regular cropping activities.
- Dr. Phil Townsend from UW-Madison doing research on identifying PVY infection through remote sensing (drone/tractor)
- Also working on identifying late blight infection up to 4 days before symptoms are visible on leaves
- Next generation is measuring foliar florescence...the percentage of light being reflected by leaves at wavelengths unique only to plant life. However, this detection equipment currently comes at large costs and has not been well modelled. Mentioned as the “next frontier”
- As for applications right now, there is a role for regular camera technologies and drones/aircraft to do crop scouting/emergence tracking.
- Still images much more useful than video

- In a non-irrigated system, NDVI / Near Infrared imaging mostly useful for tracking crop progress, identifying problem areas due to disease/emergence issues
- In the USA, you now need a certificate and licence to operate a UAV/drone
- Drones can be rapidly deployed, but battery life, durability, and weight of sensors are issues. For some applications, sensors on traditional aircraft may be more useful.
- One of the biggest hurdles is getting timely access to software/expertise to pull together the hundreds of images created by drones to stitch together into one image. Requires high speed internet with no data caps as well as some turnaround time.

Soil Health/Soil Diseases

- Soil fumigation has been shown to dramatically decrease both disease-causing as well as beneficial microbial communities. Decreasing the latter has an effect of nutrient cycling in the soil.
- A researcher from the University of Minnesota shared research on the effect of different N rates in both fumigated and non-fumigated systems
- Higher N rates in non-fumigated fields decreased foliar symptoms of early dying, but did not show an improvement in yield (often a decrease)
- Chloropicrin did show up to a 100 cwt/acre increase in yield when used for the first time in a field, but repressed microbial activity for up to 18-24 months
- May be a need for increased N rates under fumigation, as less N may be available from microbial activity
- Also did research to see if the addition of bacterial soil additives and carbon soil amendments would have an effect on marketable yield, both in fumigated and non-fumigated yields. It did not show much improvement in fumigated soils, but it did have a significant effect on yield in non-fumigated plots, both on their own, and even more when used together. Highest marketable yield improvement seen in soils with higher OM.
- Dr. Ann MacGuidwin from UW-Madison discussed effect of nematodes
- There are up to 5 million nematodes per square meter of soil, with the majority beneficial
- Did a survey of 76 fields, half fumigated, half not. Of those that weren't fumigated last year, half were previously fumigated, while half were never fumigated.
- Root lesion nematode populations were much lower in soils that were fumigated. Chloropicrin appears to have a very strong suppression of RL nematodes. Suppression of Verticillium not as strong as for nematodes
- Fumigation also had a very high effect on other soil invertebrates, many of which take longer to re-establish than nematodes
- There was discussion that targeting nematode suppression to the seed might be a strong research option for the future, to reduce effect on beneficials. Velum Prime from Bayer was discussed as such a product.
- There was discussion that forage pearl millet has shown efficacy in WI/MN as a nematode-reducing crop in rotation. Can be grown just as a regular rotation crop, doesn't have to be incorporated as a green manure/bio-fumigant
- Nematode populations are not uniform through the field. Managing "hot spots" may be more useful than widespread application

- Soil testing for Verticillium may be somewhat unreliable. Often dealing with low levels of propagules. Testing of root material might be more useful
- Soil tillage is detrimental to nematodes, especially in the top 6 inches of soil profile
- Recent research in soybeans showed strong beneficial effect of same active ingredient as Velum Prime (fluopyram) on nematodes

Dickeya/Blackleg

- Gary Secor of North Dakota State did two presentations on Dickeya and seed disease. He was a very effective communicator and would be a great speaker to bring to PEI on seed health in the future.
- Maine is the only state that has blackleg as part of their state seed certification program
- There are now 7 labs certified to test for Dickeya
- Longer crop rotation will help in reducing blackleg incidence
- Most tuber infection of Dickeya is not visible in the tuber, and can only be detected by PCR
- There is definitely spread of symptoms within the growing season. This could be both Dickeya and Pectobacterium.
- Currently not sure of whether Dickeya effectively spreads in seed cutting and handling. 2017 research focusing on this
- Also looking at other plant hosts for Dickeya, as whether Dickeya dianthicola can spread through water (so far it appears that it doesn't effectively)
- Percent infection in a seed lot sample not necessarily a good indicator of level of infection in the field, but it is recommended not to plant any lot that tests positive
- Multi-lab survey for Dickeya testing showed 98% consistency rate
- There are differences in testing procedures between different labs in the USA and Canada.
- Methods with higher number of PCR cycles are preferred for testing sensitivity
- In Wisconsin state seed evaluation, less than 3% of acres tested positive for Dickeya
- 46% of lots were clear for blackleg on field evaluation, while 95% of lots were less than 2%
- In 90% of cases where Dickeya was found, the lot also tested positive for Pectobacteria
- Only 1.4% of seed lots tested positive for Dickeya, none were recertified for seed.

Late Blight

- Dr. Amanda Gevens, UW-Madison
- US-23 still predominant strain in WI and much of the US
- 2016 wasn't a bad blight year in their area
- New products registered for late blight control – Zampro and Zing
- Innate Gen2 showing strong levels of late blight resistance for all current strains

Fusarium/Set Rot

- Gary Secor, NDSU
- Fusarium can be a component in early dying

- Fusarium infects through wounds in the seed piece. Avoiding wounds/bruises dramatically decreases routes of infection
- Seed piece treatment for Fusarium largely unnecessary if using whole seed
- Fusarium infection creates route for soft rot bacteria to flourish
- Seed treatments can foster Fusarium or soft rot if used improperly. Liquid treatments that make the seed piece too wet, or dry treatments that create a “caked” layer can create anaerobic conditions that foster both infections
- Emesto (penflufen) does not work well against Fusarium, but is effective on Rhizoctonia.
- Cruiser Maxx might be showing better efficacy, but some resistance is being seen
- In recent trials, products with mancozeb showed strong levels of Fusarium control
- In most newer products, triazole products are doing most of the heavy lifting for control.
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N-Use Efficiency

- Work at UW-Madison
- Studied multiple rates of N on Goldrush to determine ideal N rates
- Highest yields at between 200-225 lbs N applied, but only had about 20-30 cwt more than plots where only 150 lbs N were applied
- Highest N rates decreased marketable yield and specific gravity
- Found out that as much as 60 lbs of N was being added to the crop through irrigation water, just through the nitrate in the water (not added)
- When adding soil nitrate, mineralizable N through the growing season, and N from irrigation water, totals over 120 lbs N/ac
- Highlights need to accurately assess N availability before N application, both for sustainability as well as optimum yield

Colorado Potato Beetle

- There is some evidence that CPB are having longer generation intervals as a coping mechanism against insecticides.
- Delayed emergence and/or delayed generation intervals can help escape effect of neonic treatments
- Use of foliar sprays at the 1st instar stage would be essential at limiting both resistance as well as development of late season destruction
- Radiant, Coragen, Verimark all options for foliar spray

Weed Management

- Both Diquat and Linuron have been undergoing re-evaluation in the USA. Linuron restricted on low OM soil or soils with limited soil depth
- WI has state-only labels for Linuron, but only til 2020
- 2 new herbicides are currently in the approval process for potatoes in the USA
- League is a new herbicide from Valent in the USA (imazosulfuron)

- Pre and post emergence
- Effective on wild buckwheat, lambsquarters, pigweed, ragweed, barnyard grass
- Not effective on wild nightshades
- Most effective for pre-emerg
- Lots of discussion of damage on non-target crops from dicamba

Early Blight/Brown Spot

- Lots of development of degree-day models in WI that are easy to use
- Essential to apply protectants before row-touch for early blight prevention
- Mixture of base protectants (Bravo/Dithane) and systemic products
- Mixing different classes of fungicides essential for resistance management and optimum control

Review from Northeast Potato Tech Forum (March 15-16, 2017)

A few notes from some of the most relevant presentations at this year's Northeast Potato Tech Forum in Fredericton. Some presentations were already given at previous meetings this winter, and some presentations were not that applicable to on-the-ground agronomy (ie. genomics, marker assisted selection, etc). But I've tried to provide a brief overview, and for those looking for additional information, we can follow up for sure.

Use of Polymer Coated Urea (ESN) – Athyna Cambouris, AAFC, Quebec City

- Comparing ammonium nitrate, ammonium sulfate, and polymer coated urea, like ESN.
- Study over a three year period in Quebec, with and without irrigation
- Did not see a significant yield effect due to irrigation, but rainfall was reasonably good all three years
- There was an inconsistent trend across the years related to use of ESN versus other mineral N sources.
- There did seem to be a trend toward higher marketable yields when using ESN at 150 kg/ha.
- Use of ESN does appear to have a beneficial effect on reducing nitrate leaching
- Study was done in heavier Quebec soils. It was theorized that ESN may work better in sandier soils.

Nurse Cropping – Gilles Moreau, McCain NB

- Gilles provided info from trials with McCains in NB as well as some work done by University of Maine.
- In NB over three years, they have definitely been able to show that nurse crops can provide a yield bump when seeded just before potato planting and desiccated 12-18 days after planting and then incorporated at hilling. When desiccated and hilled, this resulted in about a 30 cwt/acre yield bump.

- When the nurse crop was incorporated green instead of killed first, it generally led to a yield reduction.
- Recommended to use barley instead of oats or winter rye
- Seeding rate of 175-225 lbs/acre
- Estimated cost of \$40/acre to plant and manage nurse crops
- Annual ryegrass also didn't prove acceptable in this system
- Don't leave later than 22 days after planting to kill and incorporate
- A question to be asked in PEI...could you spray the nurse crop and not incorporate it, especially for those with one-pass hilling? Something to think about.

Compost Trial – Carolyn Wilson, M.Sc. student with Dalhousie, AAFC

- Looked at 5 different types of compost: Forestry residue (high C content), forestry residue + chicken manure, marine compost with shellfish waste (high ash content), poultry manure alone, and source separated organic (lowest C:N ratio)
- In most cases, all compost mixes increased nutrient level and increased pH. Some treatments led to N immobilization due to high C:N ratios
- Applied 45 T/ha (dry weight) of compost per year...super high levels to show impact of compost rather than economical value.
- Did not show a significant effect on marketable yield, but both years of the study featured above average rainfall levels. Might have been more difference in a dry year
- Impact on disease suppression was inconsistent
- Did lead to significant increases in organic matter percentage, but differed by sources
- Indicated a potential to consider adding compost in “problem spots” rather than blanket coverage.

Yield Variability in PEI – Steve Watts

- Steve Watts presented data from our Yield Variability study
- 3 years of data
- 15 fields per year. Yield maps were used to identify areas of high and low yield within the fields, and then soil samples were taken in each zone to try and look at what factors may be having an influence on yield
- Weren't able to show clear trends on specific variables related to yield reduction.
- However, almost all samples showed very high levels of *Verticillium dahliae*
- Majority of samples were above threshold values for root lesion nematodes
- Average compaction reading was 200 psi, indicating issues with compaction
- There were individual fields where differences were seen for some nutrient levels. Need to dig into this a little more, specifically Ca and Mg.
- Still waiting on some additional test data from AAFC on soil physical properties to accompany this data.
- Will be making this report available on our website before long.

Impact of Different Forage Crops on Soil N and Potato Yield – Judith Nyiraneza, AAFC Charlottetown

- Attempting to find the balance between legumes and grasses in forage mix
- Legumes produce and release more N, but possibly at the wrong time, with potential to be leached. Grasses are better at erosion control and soil cover, but can bind N in subsequent crop when breaking down.
- Looked at effect of red clover, timothy, and 50/50 mix of the two in two years ahead of potato crop
- Timothy had lower biomass and accumulated N than clover, which was expected. Also has less nitrate leaching than clover.
- Marketable yield was slightly higher following just timothy, which was slightly surprising.
- Total yield was higher when no supplementary N was added in the potato yield. This means that the use of legumes in forage mix is contributing a significant amount of N. Estimates were that red clover is worth at least 50 lbs/acre of N for the subsequent crop, so fertility should be adjusted accordingly.

Genetic Interactions in Resistance to Verticillium Wilt – Helen Tai, AAFC Fredericton

- Working to identify genes related to Verticillium wilt resistance
- They have been able to identify a cascade of plant processes that is affected by the presence of Verticillium in the vascular system.
- Nitrogen stress has also been shown to be triggering the same pathway
- It has been shown that Verticillium responds more to ammonium than urea, so changes in N source may have an effect on reducing impact
- Looking at the possibility of “vaccinating” commercial varieties with non-pathogenic Verticillium species that may counter-act Verticillium dahliae. Much more work to be done.

Pink Rot – Rick Peters and Bennett Crane, AAFC Charlottetown

- approx 30% of strains in PEI are metalaxyl (Ridomil) resistant. Resistance levels are higher in Eastern Canada than Western Canada
- investigated effect of different control products. Orondis and foliar-applied Phostrol had excellent levels of control. Presidio also performed well. Serenade Soil was not very effective at pink rot control. Phostrol applied in-furrow was not effective.
- When looking at effect on tubers in storage, Orondis and Phostrol were also still the most effective products, with Presidio also still having good levels of control.
- Hope to develop a tool to enable in-field testing of soil to detect pink rot pathogen levels, in order to assess level of necessary treatment.

Common Scab – Gefu Wang-Pruski, Dalhousie AC

- Microflora Pro (Bacillus product) decreased scab severity by about half in Prospects, and also reduced level of deep pitting. Variable results on other varieties.

- Double Nickel and Phostrol showed no significant effect in reducing scab
- Microflora Pro also seems to enhance the skin appearance in some varieties
- Will be repeated again in 2017
- Was able to show that there is a variety difference in the number of cell layers in the skin of different varieties, as well as the cell structure. Prospect only has 7 cell layers in its skin, compared to 11-12 layers in Goldrush...this may be highly related to scab resistance.
- Use of products like Microflora Pro appeared to thicken the cell layers in certain varieties. More research needed.

Whole versus Cut Seed – Josee Owen, AAFC Fredericton

- Similar to what we have done, NB has done two years of assessing cut seed versus whole seed, but more from a seed production standpoint than a commercial standpoint.
- Looked at different spacings (6, 8, 10, 12 inches) and different plant densities.
- Russet Burbank, Elite 1. Small whole seed not grouped into multiple size categories in first trial
- Did not see much sig. difference in yield between the treatments. Tighter spacing generally gave more tubers, but of smaller size distribution.
- In second trial, managed whole seed in three different sizes at two different spacings (12, 15 inches)
- Didn't see much difference in yield across this trial. Largest number of tubers in medium sized whole tubers at 15 inches.
- Smallest size of whole seed yielded significantly less, but whole seed generally yielded slightly more than cut seed. More study needed.
- Potentially to pool results from PEI and NB for larger analysis.

CIPC effect on cut seed – John Walsh, McCain

- Similar presentation to what was shared from NB potato conference
- Definitely seeing a trend for CIPC residues causing delayed emergence
- Residues of 0.10 to 0.20 ppm showed noticeable delays in emergence and reductions in yield
- Some varieties affected more than others
- Tubers with residues of 0.20 ppm had 90 cwt/ac less yield than control (0 ppm)
- When sampling grower storages, a majority of samples showed some level of detection, with some up to 0.25 ppm
- Amounts over 0.025 ppm can affect performance
- Steam cleaning of storages can help, but may take multiple years to get rid of CIPC
- CIPC found penetrating layers of concrete and wood...can stick around for a while
- Advising cutting seed in a building that hasn't had any use of CIPC where possible
- If this isn't possible, steam clean each year and look at measuring residue levels. Also ensure proper cleaning of cleaning equipment and trucks that handle seed.

Mechanical Transmission of PVY – Mathuresh Singh, Potatoes NB

- Mathuresh has seen that with the new necrotic strains of PVY that are prevalent that mechanical transmission of PVY is much more significant than in older PVY strains
- Showed that PVY spread in sprayer rows was always much higher than in other rows
- Tried to account for other variables for PVY spread, but presence of mechanical damage on leaves by tractor tires was highest factor in in-row PVY spread.
- Would indicate that it would be important to rogue wheel tracks first, and not to sample for PVY from tracks. For early generation seed, it might be worth looking at tramlines if trying for clear reading.
- PVY^{NTN} is more competitive than other strains and seems to spread more rapidly within season.

1,4 SEED as a Dormancy Enhancer for Seed – Loretta Mikitzel, NBDAAF

- Looking at how to warm seed before planting without sprouting
- 1,4 SEED – “Dormancy Enhancer”, liquid aerosol, applied 60d before planting
- Treated seed 60 days before planting with 5, 10 or 20 ppm
- Treated in sealed drums, closed for 72 hrs at 8C
- Held for 60 day, eventually raised to 10C
- Did not have a significant effect of emergence
- 20 ppm increased stem numbers a little in Burbank, a lot in Innovator
- 20 ppm increased number of smalls and reduced % 10 oz in both varieties
- Higher rates did see a decrease in total yield in Burbank
- Could have a role in making a more consistent size profile in seed production for some varieties

Common Scab – Claudia Goyer, AAFC Fredericton

- Looked at multiple sites in NB, PEI and QC to see what are the main factors influencing scab
- Soil conditions that had high correlations with scab: pH, K, Ca, Mg, C, C:N ratio
- Condition with negative correlation to scab: P, Al, Fe
- Not sure if these are direct or indirect correlations
- Looked at soil microbiological communities in areas with high and low scab. First analysis doesn't show much difference at a phylum level, but more study is needed, down to a Genus level
- Soil diversity highly correlated with pH, water content of soil, and soil OM

If anyone wants more information on any of these topics, I would be happy to discuss, or I can try and access additional information.

Cheers

Ryan