The Dickeya Situation Update
2015 Timeline

- 2014 – reports of Dickeya in Maine & Quebec
- June 2015 – die off of plants in PA, DE & NJ
- July 2015 – report written from ME Extension outlining findings and recommendations
- August 2015 – discussions with PPQ at the NPB meeting
- August 2015 – call with seed certification officials
Current Dickeya finds

- Dickeya has been found in: US (FL, ID, IN, OH, ME, MI, MN, MD, NJ, NM, NY, NC, ND, PA, TX & WI) Canada (Ontario & New Brunswick)
- This summer Dickeya has been reported in potato fields in 11 states (DE, FL, ME, MD, MA, NJ, NC, PA, RI, VA, WV)
Dickeya is a type of bacteria that causes blackleg.

Symptoms are blackening and decay of lower stem or the “leg” of the plant.

There are 7 species of Dickeya and 3 are found in the US: *D. dianthicola, D. dadantii, D. chrysanthemi*.

*Dickeya dianthicola* seems to be the most damaging.
Other related bacteria

- *Pectobacterium* is another bacteria that causes similar blackleg symptoms
- Several *Pectobacterium* species are endemic in US potatoes including:
  - *P. atrospeticum*
  - *P. carotovorum subsp. carotovorum*
  - *P. carotovorum subsp. brasiliense*
  - *P. carotovorum subsp. ordoriferum*
  - *P. wasabiae*
Area that was flooded
Challenges Dealing with Dickeya

- No chemical controls
- No resistant potato varieties
- Disease expression doesn’t occur unless conditions are right – favors hot humid conditions
- No visual symptoms on seed
National Efforts

- Several conference calls with seed certification officials
- National Potato Council will:
  - Facilitate pulling together the best science based information available for dealing with this disease
  - Sponsor a symposium in the fall to share the latest science and management strategies to date
ARS funded research on detecting, diagnosing and controlling blackleg in ME, MN, MI, NY & ND

A Specialty Crop Research Initiative (SCRI) 5 year $3 million grant proposal entitled: *Integrating next generation technologies for management of bacterial soft rot pathogens of potatoes*, was not funded, but will be resubmitted.
Research Needs

- Real-time PCR assay for *Dickeya* species for seed lot testing
- Thresholds in seed lots?
- How to test water for *Dickeya*?
- Management during seed cutting and harvest?
- In-field management (irrigation, nitrogen and ??)
PPQ formed a cross functional working group
Initiated a New Pest Advisory Group
Developed a website which includes:
  - the NPC testing protocols
  - Best Management Practices
Tested 80+ samples from 17 states – 9 different states were positive for *Dickeya dianthicola* from all regions of the US
Monitoring for potential trade implications
On May 17, 2016 APHIS/PPQ classified *Dickeya dianthicola* as a non-reportable/non-actionable pathogen because it appears to be widespread across the US. No detections of *Dickeya solani*, which is not known to occur in North America.
Maine’s Approach

Multi-Pronged
Inspectors were asked to note blackleg percentage

Of 1,103 seed lots
- 82% - no blackleg
- 11% - .01-.25%
- 5.9% - > .25%

These results were noted on the NA Health Certificate
Scottish delegation

- Scottish scientists visited Maine in 10/15
- Met with growers, Dept. & MPB staff to share their experiences and provided advice
- Spent time in the lab helping with testing protocols and lab set up
- Presented a national webinar and answered questions
- Continue to provide assistance
Rule changes as of May 2016

- Added a separate field inspection for blackleg
- Established tolerances for blackleg
  - FY 1 – 0.1%
  - FY 2 – 0.2%
  - FY 3 – 1.0%
  - FY 4 – 2.0%
  - FY 5 – 2.0%
- Eliminated one FY eligible for certification
- Allow for lab testing of more post harvest samples
## Blackleg tolerances

<table>
<thead>
<tr>
<th>State</th>
<th>FY1</th>
<th>FY2</th>
<th>FY3</th>
<th>FY4</th>
<th>FY5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wisconsin</td>
<td>Reported but no set tolerance</td>
<td>Reported but no set tolerance</td>
<td>Reported but no set tolerance</td>
<td>Reported but no set tolerance</td>
<td>Reported but no set tolerance</td>
</tr>
<tr>
<td>Michigan</td>
<td>Reported but no set tolerance</td>
<td>Reported but no set tolerance</td>
<td>Reported but no set tolerance</td>
<td>Reported but no set tolerance</td>
<td>Reported but no set tolerance</td>
</tr>
<tr>
<td>Colorado</td>
<td>0%</td>
<td>0.1%</td>
<td>0.5 – 4.0%*</td>
<td>0.5 – 4.0%*</td>
<td>0.5 – 4.0%*</td>
</tr>
<tr>
<td>North Dakota</td>
<td>Reported but no set tolerance</td>
<td>Reported but no set tolerance</td>
<td>Reported but no set tolerance</td>
<td>Reported but no set tolerance</td>
<td>Reported but no set tolerance</td>
</tr>
<tr>
<td>Utah</td>
<td>0 – 0.1%</td>
<td>0 – 0.1%</td>
<td>0 – 0.1%</td>
<td>0.5%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Minnesota</td>
<td>No regulation</td>
<td>No regulation</td>
<td>No regulation</td>
<td>No regulation</td>
<td>No regulation</td>
</tr>
<tr>
<td>Oregon</td>
<td>0%</td>
<td>0.1%</td>
<td>0.3%</td>
<td>1.0% – 3.0%**</td>
<td>1.0% – 3.0%**</td>
</tr>
<tr>
<td>Idaho</td>
<td>0%</td>
<td>0.1%</td>
<td>0.5%</td>
<td>1.0%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Canada</td>
<td>0%</td>
<td>0.1%</td>
<td>0.2%</td>
<td>0.3%</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

Note: This is a sample of states and may not include all states with blackleg tolerances.
Plans for 2016

- Implement rule changes
- Dormant tuber testing
- Screening survey of 2 specific field years (FY) to determine blackleg levels
- Additional staff for field inspections
Lab Testing

- Samples are submitted voluntarily
- Results from dormant tuber testing for the 2015 crop indicated about 16% incidence of Dickeya based on 347 samples
- Testing of 350 plant samples of the 2016 crop indicated 25% were positive for Dickeya
Field Inspections

- Observing blackleg symptoms in the field
- Some fields are not meeting tolerances
- Growers are submitting suspect samples for testing
- Added 1 seasonal inspector
Future Suggestions

- Support research – there are lots of unanswered questions regarding this disease
- Management options – for prevention and getting the disease out of the production system
- Common testing protocol
- Better communication between the scientific and the regulatory community
- Others???
Thanks to Amy Charkowski, Professor Department of Plant Pathology, University of Wisconsin for the use of some of her slides.