Wisconsin Department of Agriculture, Trade and Consumer Protection

Wisconsin Pest Survey Reports 2010

http://pestsurvey.wi.gov/

Corky Ringspot Survey
Tobacco Rattle Virus (TRV)

Funding provided by USDA Specialty Crop Block Grant

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Corky Ringspot Disease in the US

- California,
- Florida,
- Idaho,
- Washington
- Oregon
- Michigan
- Minnesota
- Wisconsin


Internal tuber necrosis caused by TRV.
Tobacco rattle virus particles seen under transmission electron microscope.
Perennials Infected with Tobacco Rattle Virus

- Astilbe
- Peony
- Hosta
- Coral bells
- Bleeding heart
- Barrenwort
Laboratory testing is performed at Plant Industry Laboratory.
We use nucleic acid assays, RT-PCR (reverse transcription polymerase chain reaction).
We use a beta-tubulin reference gene as an internal control to validate RT-PCR.

References:
Tobacco Rattle Virus (TRV) and Nematodes

- TRV is transmitted by Stubby root nematodes *Trichodorus* spp. and *Paratrichodorus* spp.
- These nematodes are present in Wisconsin.
- Hosts range is huge: potatoes, tomatoes, peppers, including many weeds, annuals and perennials (white & red clover, oats).
- **Non-hosts are alfalfa, corn, barley, rye, wheat, carrots and pumpkin.**
- **Control Management: Rotation with alfalfa plus weed control.**
Results

- A total of 392 samples in 24 counties were tested.
- Minimum 8 tubers per sample.
- 69 producers were sampled including variety of farming operations.
- All major potato growing areas in the state were tested.
Results

- **Number of potato samples tested by source**
  - seed growers: 80
  - processing companies: 153
  - fresh market producers: 60
  - Certified Organic: 72
  - Conventional: 320

- **Total**: 392
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2009 & 2010 Survey for Corky Ringspot Disease

• Five Farms tested positive.
• 6 fields out of 392 total (1.5%)
• Buffalo Co. (2 samples) interior tuber blemishes present.
• Dunn Co. (1 sample), symptomatic
• Adams, Portage and Langlade (1 sample each), very faint symptoms, no significant disease problems.

• Conclusion: Corky ringspot disease is still incidental in Wisconsin.
Powdery Scab Survey
Spongospora subterranea f.sp. subterranea

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Symptoms of Powdery Scab on Potato Tubers,
*Spongospora subterranea* (Wallr.) Lagerh f.sp. *subterranea* Tomlinson
The Problem

• Affects quality of potatoes (tuber skin blemishes and tumors)

• Affects crop productivity

• Affects storability

• Vectors Potato Mop Top Virus (PMTV)

• Creates infection opportunities for other diseases: Late blight (*Phytophthora infestans*)

  Pink rot (*Phytophthora erthroseptica*)

  Dry rot (*Fusarium spp.*)

  Black dot (*Colletotrichum coccodes*)
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Powdery Scab Disease of Potatoes

Conditions Favoring Disease

• Cool temperate summers
  (Soil temperatures of 52°F to 64°F)

• Alternate periods of wet and dry soil,
  (Simulated by irrigation)

• Excess moisture during tuber set.

• Environmental conditions may be more important than amount of inoculum.

Pustules of Powdery scab on Red Norland Potato.

A. Phibbs
• Laboratory testing is performed at Plant Industry Laboratory.
• We use nucleic acid assays, PCR (polymerase chain reaction).
• Sequencing
• Examine tuber skin with microscopes.

References:
Qu et.al. (Plant Pathology (2001) 50: 420-426).
<table>
<thead>
<tr>
<th>Harvest year</th>
<th>2009</th>
<th>2010</th>
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</thead>
<tbody>
<tr>
<td>Total number of samples tested for powdery scab</td>
<td>223</td>
<td>115</td>
</tr>
<tr>
<td>Percent of samples testing positive</td>
<td>19%</td>
<td>3%</td>
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<tr>
<td>Number of growers participating</td>
<td>32</td>
<td>37</td>
</tr>
<tr>
<td>Number of counties surveyed</td>
<td>14</td>
<td>24*</td>
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Distribution of Powdery Scab in Wisconsin since 2002*

- Adams
- Dane
- Dunn
- Oconto
- Juneau
- Langlade
- Pepin
- Portage
- Waushara

* at least one field testing positive in each County.
Varieties testing positive for Powdery Scab since 2002:

- Atlantic (no tuber symptoms)
- Bannock
- Burbank (no tuber symptoms)
- Gold Rush
- (Dark) Red Norland
- Norkotah
- MegaChip
- Molly
- Ranger Russet
- Russian Banana
- Shepody
- Silverton (no tuber symptoms)
Potential Trapping Crops

• Red Clover  (*Trifolium pratense*)
• Buckwheat  (*Fagopyrum esculentum*)
• Rye  (*Secale cereale*)
• Rapeseed  (*Brassica napus*)
• Oilseed radish  (*Raphanus sativus*)

Avoid Host Plants of Powdery Scab

Weeds:
- Weeds in the Nightshade family
- Yellow Mustard

Crops:
- Oats
- Tomato
- Potato

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