Diagnostic Updates

Diagnosis of Powdery Scab (*Spongospora subterranea* **f.sp.** *subterranea*)

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Powdery scab is a disease of potatoes in most potato growing areas. This slime fungus also vectors potato mop top virus (PMTV). Potato tubers heavily infested with powdery scab produce large amounts of spore balls or cystosori and
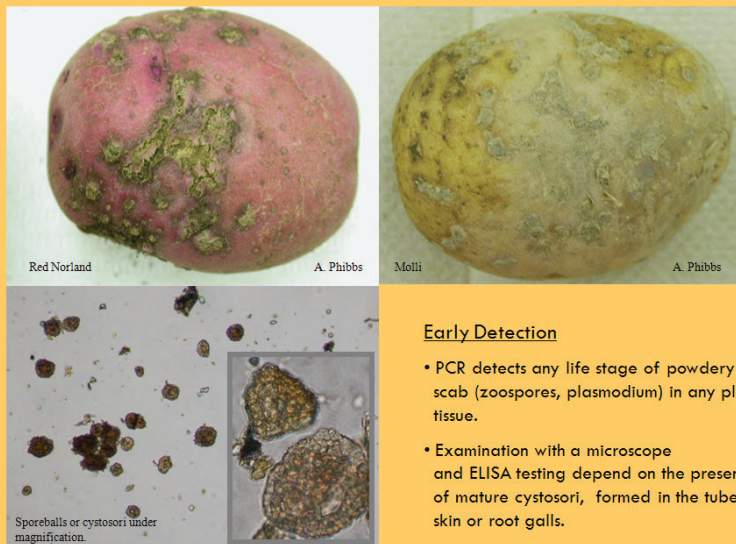

Symptoms of Powdery Scab on Potato Tubers
Spongospora subterranea (Wallr.) Lagerh *f.sp. subterranea* Tomlinson

Red Norland   A. Phibbs   Molli   A. Phibbs

Sporeballs or cystosori under magnification.

Early Detection

• PCR detects any life stage of powdery scab (zoospores, plasmodium) in any plant tissue.

• Examination with a microscope and ELISA testing depend on the presence of mature cystosori, formed in the tuber skin or root galls.

can be easily diagnosed by microscopy. For less infected tubers the diagnosis becomes more tenuous and a Bioreba Agri strip test will be helpful in verifying the presence of sporeballs. This ELISA based test does rely on the presence of cystosori.

Many Russet varieties do not show tuber symptoms and therefore do not form sporeballs on potato skins. To detect powdery scab in both symptomatic and asymptomatic tubers and soil, we have been using a PCR with selective primers developed by Dr. Qu at Dr. Barb Christ's lab at Penn State (Plant Pathology (2001) 50, 420-426 X.-S. Qu, J.A. Kavanagh, D.

Egan and H. Lahert). For extraction of DNA from tuber and soil we prefer MoBiolabs Powersoil Extraction kit.

We adapted Dr. Qu's protocol for use on our real time PCR instrument (Biorad Opticon 2, formerly MJ Research) with SYBR green. Primers SsF 5' GTCGGTTCTACCGGCAGACC 3' and SsR 5' GCACGCCAATGGTTAGAGACG 3' are used at a final concentration of $0.2\mu M$. The cycling program consists of $95°C$ for 15 sec, $57°C$ for 35 sec, $72°C$ for 30 sec, final $72°C$ for 5 min. Follow the protocol of your SYBR green mix and include activation temperature and time for hot start mixes. The melting temperature of the amplification product will be $85°C$ or 434 bp for endpoint PCR. 🍃

NPDN-USDA APHIS 2010 Now Offering Advanced Diagnostic Training on Bioinformatics

Karen L. Snover-Clift, Cornell University and Laurene Levy, USDA-APHIS-PPQ-CHPST-NPGBL

The NPDN Diagnostics Program Area Committee and members of USDA-APHIS-PPQ-CHPST-National Plant Germplasm and Biotechnology Laboratory (NPGBL) are offering training sessions on Bioinformatics this summer. The sessions are offered the weeks of July 12, 2010 (July 12,