Potato Progress

Research & Extension for the Potato Industry of Idaho, Oregon, & Washington

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Project Summary: Columbia Root-Knot Nematode Variability

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Columbia root-knot nematode (CRKN; *Meloidogyne chitwoodi*) is widespread in the Pacific Northwest and is a significant threat to a sustainable potato production in the region. CRKN causes tuber defects, which can make entire shipments unmarketable even if only a relatively low percentage of tubers are affected. CRKN is a quarantine pest, which places restrictions on infested shipments to export markets. Control of CRKN heavily relies on costly chemical control tactics. Breeding efforts to develop resistant potato cultivars are underway but CRKN races that are able to break resistance genes in potato have recently been discovered.

The goal of this study is to survey the variability of CRKN and to develop better tools to identify resistance-breaking CRKN races. This project will benefit the potato industry because it will lead to a better understanding of the disease potential of CRKN and allow for more targeted resistance breeding.

IN ORDER TO CONDUCT THIS STUDY WE NEED YOUR HELP!

- **We need potato tubers that show symptoms of CRKN infection**. Typical symptoms include galls (bumps) on the surface of tubers (Fig. 1) and small brown spots in the flesh close to the skin (Fig. 2).
- **We need to know the location of where these tubers were grown** (at minimum county level, but more detailed information is welcome).
- **We need 10-15 tubers with symptoms per field.**

If you see tubers that show typical nematode symptoms as described above, please contact the project leader. We will cover shipping fees for tubers sent to our lab in Pullman or can arrange for pickup if you set the tubers aside for us. Your participation in this project is greatly appreciated!

Shipping address (please contact Axel Elling **prior** to shipping to arrange for free shipping):
Axel Elling
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100 Dairy Road
201 Johnson Hall
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Typical symptoms of CRKN infection:

Fig. 1. CRKN symptoms can range from severe growth distortions (left) in tubers from heavily infested fields to tubers with galls and bumps on the surface (right) from fields with low nematode numbers.

Fig. 2. When peeled, infected tubers show small brown spots (left). These spots are always close to the tuber skin (right).

Checklist for Managing Late Blight Infected Tubers in Storage

Dennis A. Johnson, Plant Pathologist, Washington State University

Late blight was present this growing season throughout the Columbia Basin. Infected tubers are inevitably being harvested and placed in some storages. Following is a checklist for managing potatoes in storage that may contain late blight infected tubers. These suggestions also apply for pink rot and Pythium leak. Additional information can be found at http://classes.plantpath.wsu.edu/dajohn.

1. Continue late blight fungicide applications until harvest or until all vines are dead.

2. Harvest only during dry weather.

3. Harvest when tuber pulp temperature is 45-65º F.

4. Store known infected tuber lots separate from non-infected lots.

5. Store known infected tuber lots where they can be easily obtained for processing.

6. Sort for rot going into storage –Provide sufficient light and people to do the job.

7. Provide adequate air flow throughout the storage (25 cfm/ton).

8. Cool and dry the tubers as quickly as possible.

9. Cure tubers at the lowest temperature possible (50º F) or eliminate the curing period, depending on the amount of rot.

10. Cool the pile to the final storage temperature as quickly as possible – about 42º F for table stock, 45º F for French fry processing and 50º F for potato chips. It may be necessary to cool and hold tubers for processing and chips below the typically recommended temperatures.

11. Do not humidify.

12. Run fans continuously. Recirculate air through the tubers at all times, even when outside air is not being introduced.

13. Keep piles shallow to promote air movement and removal of hot spots.

14. Monitor storages daily. Determine temperature of the piles at various depths and locations. Serious late blight problems usually show up with 6 weeks of storage.

15. Do not expose cold tubers to outside air and any tubers to air at or below freezing.

16. Tubers of Alturas and Umatilla are moderately resistant, and tubers of Defender are resistant. Storage problems with these cultivars should be less than with other cultivars. However, good air movement and temperature and humidity management will be needed when storing infected tubers of all cultivars.

Potato Late Blight

See also: http://www.nwpotatoresearch.com/

Tuber Late Blight

Tuber infection begins superficially, but can invade entire tuber. Sporulation can occur on cut or uncut tubers.

Management

1. Prevention is key
2. Harvest during dry weather
3. Tuber temperatures going into storage should be less than 68 F
4. Mancozeb and metiram fungicides on the soil surface late season may help prevent tuber infection
5. Foliar applications of phosphorous acid at harvest and in storage can reduce late blight tuber rot
6. Late blight infection often leads to other kinds of tuber rots in storage -- it is best to NOT STORE late blight infected potatoes, and there are no chemical treatments that will cure an infected pile of potatoes

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General Information

Causal Agent: *Phytophthora infestans*
Biology: Pathogen of potato and a few related plants; infection encouraged by humid and wet conditions
Dispersal: Sporangia move in the wind; zoospores in water
Fungicide resistance: *P. infestans* is well-known to become resistant to site-specific fungicides used against it. Fungicides should be rotated frequently to prevent resistance.