



Pale Cyst Nematode (*Globodera pallida*) Eradication Program- Idaho Falls, Idaho

October 2010 Report

Background

Pale cyst nematodes (PCN), *Globodera pallida*, are soil-borne organisms that do not infest potato tubers. The pests infest feeder roots, where the females attach, feed, and become sedentary. Nematodes reproduce sexually. Females form cysts containing 200 to 600 eggs, which can stay dormant for up to 30 years while the eggs inside remain viable. On host plants, large numbers of PCN can cause wilting, stunted growth, poor root development, and early plant death. If left uncontrolled, PCN can reduce yields up to 80 percent in potato fields. Even with only minor symptoms showing on the foliage, PCN can significantly reduce tuber size. PCN spread primarily by the transport of cysts in soil. This may occur with the movement of soil on farming, construction, and other equipment; infested soil adhering to seed potatoes and other regulated crops; and any other items or means of transport such as water.

On April 19, 2006, officials of USDA's Animal and Plant Health Inspection Service (APHIS) and the Idaho State Department of Agriculture (ISDA) announced the detection of PCN, a major pest of potato crops. This was the first detection of the pest in the United States. The nematode cysts were detected during a routine survey of tare soil at an ISDA grading facility in eastern Idaho. Subsequent 2006 surveying to determine the possible origin and distribution of the pest in Idaho confirmed seven PCN-infested fields totaling 911 acres, all within a one mile radius in Bingham and Bonneville Counties, Idaho. The PCN-infested fields and an area surrounding the fields were placed under a Federal Domestic Quarantine Order and parallel State Rule in August 2006, establishing restrictions on movement of certain regulated articles from Idaho in order to prevent the spread of PCN.

As a result of continued intensive soil sampling in 2007 and 2008, an additional two PCN-infested fields were found in Bingham County, Idaho. The nine PCN-infested fields all continue to be within a one mile radius and the fields associated with them through shared tenancy, farming practices, equipment, and/or shared borders have been extensively surveyed and regulated. Since program inception, a total of 30,753 acres have been regulated due to their infestation or association with an infested field. Non-infested, associated fields have been eligible for federal deregulation following a sequence of soil surveys with no PCN detections. To date, 29,327 acres have been released from federal regulation. Currently, 1,426 acres remain regulated, of which 1,100 are PCN-infested.

Eradication treatments of PCN-infested fields have been ongoing since the spring of 2007. Eradication treatments have included methyl bromide fumigation, Telone II fumigation, and biofumigant plantings. Testing of the soil in infested fields indicates the average viability of eggs within the PCN cysts have declined by more than 95% since eradication treatments began.

A description of the current PCN regulated area can be found at:

http://www.aphis.usda.gov/plant_health/plant_pest_info/potato/pcn-maps.shtml

The current Federal PCN rule revised as of January 1, 2010:

http://www.aphis.usda.gov/plant_health/plant_pest_info/potato/downloads/pcndocs/7cfr-10.txt

Survey Information

| Type of survey | Idaho soil samples collected | |
|----------------|------------------------------|-------------------------|
| | October 2010 | Since program inception |
| Detection | 8,615 | 112,000 |
| Delimiting | 1,717 | 129,939 |
| Eradication | 0 | 52,586 |
| Total | 10,332 | 294,525 |

Identification and Diagnostics

| Type of survey | Samples processed by the Idaho PCN Laboratory | | | Results | | |
|----------------|---|-------------------|-------------------------|----------------------|-------------------|---------------------------------|
| | October 2010 | 2010 Year to date | Since program inception | October 2010 results | 2010 Year to date | Results since program inception |
| Detection | 0 | 40,499 | 71,329 | Negative | Negative | Negative |
| Delimiting | 368 | 2,881 | 117,983 | Negative | Negative | Negative ¹ |
| Eradication | 45 | 4,467 | 50,781 | N/A | N/A | N/A |
| Total | 413 | 47,847 | 240,093 | | | |

¹Except for samples confirmed for the eighth and ninth infested fields

| Type of survey | Samples processed by the Idaho Food Quality Assurance Laboratory | |
|----------------|--|-----------------------|
| | Since program inception | Results |
| Detection | 49,984 | Negative |
| Delimiting | 10,224 | Negative ¹ |
| Total | 60,208 | |

¹Except for samples confirmed for the first seven infested fields

Program Research

There is currently a great deal of research underway at the University of Idaho. The whole cyst bioassay protocols are being finalized and several bioassay samples are currently in containment. An alternative host study is currently being completed, with cyst counts being made. An evaluation of potato breeding lines for PCN resistance is also underway. A biocontrol study using microorganisms collected from PCN cysts from a field in Southern Idaho began on the 14th. A biofumigation study on the effects of *Brassica juncea* seed meal on PCN cysts commenced. A diapauses study has also begun which will look at PCN population on a monthly basis to determine the best diapauses interval for this PCN population. The trap crop study using sticky nightshade is almost complete, with no PCN reproduction on any of the 52 accessions of *S. sisymbriofolium* which included a transgenic line

with increased root mass. Also trying to determine the best time frame to deploy mustards as green manure (i.e. Spring or Fall)

Eradication Activities

There were no eradication activities in October, 2010.

Telone II was applied in the late summer of 2007, 2008, and 2010. Telone II was not applied in 2009 due to a world-wide shortage of this chemical.

Biofumigants with nematicidal activity were planted in the infested fields in the summers of 2007 (oil radish) and 2009 (arugula).

Regulatory Actions

The PCN-regulated area was not amended in October.

Regulatory Treatments

| Treatment type | Regulatory Treatments (# of pieces of equipment) | | |
|-----------------|---|-------------------|--------------------------------------|
| | October 2010 | 2010 Year to date | Since program inception ¹ |
| Pressure Washed | 25 | 367 | >6,500 |
| Steam Sanitized | 5 | 185 | >800 |
| Total | 30 | 552 | >7,300 |

¹A review of regulatory data is underway while new data collection and management tools are developed.

Regulatory Documentation

| Documentation type | Regulatory Documentation | | |
|---------------------------|--------------------------|-------------------|--------------------------------------|
| | October 2010 | 2010 Year to date | Since program inception ¹ |
| Certificate (PPQ 540) | 13 | 206 | 5,496 |
| Limited Permit (PPQ 530) | 1 | 204 | 1,180 |
| New compliance agreements | 0 | 6 | 136 |

¹A review of regulatory data is underway while new data collection and management tools are developed.

Impacts on Commerce

In response to the initial PCN detection in 2006, Canada, Mexico and Korea shut off importation of potatoes from Idaho, while Japan cut off importation of potatoes from the entire U.S. The Mexican and Canadian export markets have both been re-opened with the exception of potatoes from PCN-regulated areas. Both require PCN soil surveys from origin fields. The Korean market was reopened in June, 2010 with the exception of potatoes originating from Bingham and Bonneville Counties, ID. The Japanese market remains closed to Idaho potatoes but negotiations are actively underway to re-

gain market access. Because of extensive field surveys conducted throughout production areas in Idaho, all of which have been negative beyond the nine infested fields, the general opinion by our trading partners is that potatoes produced outside regulated areas do not pose the biological risk for introduction of PCN.

Communication and Outreach

The next stakeholder update is due out in December, 2010. Stakeholder updates are available at:

http://www.aphis.usda.gov/plant_health/plant_pest_info/potato/pcn_stakeholder.shtml