



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

November 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, 29,653 acres have been released from federal regulation. Currently, 1,100 acres (only the PCN-infested fields) remain regulated.

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. In 2010, three infested fields triggered bioassay when no viability was detected in cysts collected those fields. Bioassays are currently underway at the University of Idaho in Moscow.

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	
	November 2010	Since program inception
Detection	6,096	118,096
Delimiting	113	130,052
Eradication	0	52,586
Total	6,209	300,734

Identification and Diagnostics

Type of survey	Samples processed by the Idaho PCN Laboratory			Results		
	November 2010	2010 Year to date	Since program inception	November 2010 results	2010 Year to date	Results since program inception
Detection	218	40,717	71,547	Negative	Negative	Negative
Delimiting	1,517	4,398	119,500	Negative	Negative	Negative ¹
Eradication	191	4,658	50,972	N/A	N/A	N/A
Total	1,926	49,773	242,019			

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

Bioassays are currently underway to University of Idaho in Moscow for several of the fields. The first round of plant growth on the samples will soon be completed. Greenhouse experiments on potential bacterial biocontrol agents and the use of *Brassica juncea* seed meal as a biofumigant are underway. A laboratory study on PCN diapause requirements was begun in December.

In Washington, the ARS has two lab studies on hatching factors ongoing and molecular work starting on microorganisms isolated from field cysts (possible biocontrol agents) and molecular work on the nematodes relating to biotype

Eradication Activities

There were no eradication activities in November, 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 amended on November 23rd, when 326 acres were deregulated following a series of soil surveys with no PCN detections.

Regulatory Treatments

Treatment type	Regulatory Treatments (# of pieces of equipment)		
	November 2010	2010 Year to date	Since program inception ¹
Pressure Washed	18	385	>6,500
Steam Sanitized	12	197	>800
Total	30	582	>7,300

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

Regulatory Documentation

Documentation type	Regulatory Documentation		
	November 2010	2010 Year to date	Since program inception ¹
Certificate (PPQ 540)	13	219	5,509
Limited Permit (PPQ 530)	0	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 regain 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

Members of the Washington Potato Commission visited the PCN Program on November 4th. The infested field owners and operators met at the PCN Program office on November 17th.

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