



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

2011 1st Quarter 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 since 2007, three additional PCN-infested fields have been found in Bingham and Bonneville Counties, Idaho. The ten PCN-infested fields lie within a roughly three 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 30,917 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, 1,264 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 can be found at:

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	
	1 st Quarter of 2011	Since program inception
Detection	444	118,540
Delimiting	0	130,052
Eradication	0	52,586
Total	0	301,178

Identification and Diagnostics

Type of survey	Samples processed by the Idaho PCN Laboratory			Results		
	1 st Quarter of 2011	2011 Year to date	Since program inception	1 st Quarter of 2011	2011 Year to date	Since program inception
Detection	18,683	18,683	91,463	Negative ¹	Negative ¹	Negative ²
Delimiting	0	0	119,617	N/A	N/A	Negative ²
Eradication	0	0	52,652	N/A	N/A	N/A
Total	18,683	18,683	263,732			

¹Except for samples confirmed for tenth infested field

²Except for samples confirmed for the eighth, ninth, and tenth 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

A number of PCN research initiatives have continued during this time at the University of Idaho, in Prosser and at WSU. The bacterial and fungal biocontrol of PCN study is ongoing at U of I. Studies of the nematicidal effect of *Brassica* seed meal are ongoing at U of I. An alternate trap crop/diffusate study will be starting soon with Chuck Brown. Another round of studying alternate PCN hosts with Rick Boydston will also be starting soon. Prosser is looking at different accessions of sticky nightshade to find less thorny varieties. Bioassays and hatching tests from both core samples and surface samples is ongoing. U of I has developed a potato diffusate production system based on tissue culture plants that produces high quality root diffusate that is consistent and reproducible.

The ARS GN program at Cornell is also working on a number of initiatives, including transgenic potato lines that may silence nematode genes. They have published molecular diagnostics for *Globodera* species. Funding for the FY12 potato breeding program has been cut from the US budget.

Eradication Activities

There were no eradication activities in the first quarter of 2011.

Methyl bromide was applied to the infested fields in the spring of 2007, 2008, 2009, and 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

In the first quarter of 2011, a 10th infested field was detected. Trace-forward and trace-back investigations of farm equipment and regulated articles from the 10th infested field are in progress. Acreage associated with this 10th field is being investigated. Any consequent increase in the size of the regulated area is expected to be determined and published in the second quarter of 2011.

Regulatory Treatments

Treatment type	Regulatory Treatments (# of pieces of equipment)		
	January-March 2011	2011 Year to date	Since program inception ¹
Pressure Washed	8	8	7,317
Steam Sanitized	13	13	1,198
Total	21	21	8,515

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

Regulatory Documentation

Documentation type	Regulatory Documentation		
	January-March 2011	2011 Year to date	Since program inception ¹
Certificate (PPQ 540)	17	17	5,563
Limited Permit (PPQ 530)	1	1	1,181
New compliance agreements	0	0	136

¹The review of PPQ 540 issuance data has been completed. A review of PPQ 530 issuance data is underway.

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

The map of the regulated area was updated on March 21, 2011 to reflect the detection of the 10th infested field. A new map update will be published if and when additional acres are regulated for their association with the 10th infested field.

Budgetary uncertainty caused several contingency plans to be drafted for program operations during the first quarter of 2011. At present, the program expects to conduct eradication treatments this spring, although possibly on a reduced scale.

The next stakeholder update is due out in May, 2011. Stakeholder updates are available at:
http://www.aphis.usda.gov/plant_health/plant_pest_info/potato/pcn_stakeholder.shtml