



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

2011 3rd 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 spreads 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, an additional five PCN-infested fields have been found in Bingham and Bonneville Counties, Idaho. All 12 known infested fields lay within a 2.5-mile radius. The fields associated with them through shared tenancy, farming practices, equipment, and/or shared borders have been extensively surveyed and regulated. Since program inception, approximately 36,100 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; however, approximately 2,500 acres have been re-regulated due to a new association with an the infested field since its deregulation. Currently, 15,533 acres of farmland are regulated, 1,467 acres of which are infested fields.

Eradication treatments in 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 has declined by more than 99% since eradication treatments began. In 2010, three infested fields triggered bioassay when no viability was detected in cysts collected from 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		
	3 rd Quarter of 2011	2011 Year to date	Since program inception
Detection	2,985	14,726	132,842
Delimiting	6,400	21,437	151,491
Eradication	2,358	5,752	59,237
Total	11,743	41,915	343,570

Identification and Diagnostics

Type of survey	Samples processed by the Idaho PCN Laboratory			Results		
	3 rd Quarter of 2011	2011 Year to date	Since program inception	3 rd Quarter of 2011	2011 Year to date	Since program inception
Detection	12,271	39,955	112,735	Negative	Negative ¹	Negative ¹
Delimiting	16,425	16,425	136,042	Negative ²	Negative ²	Negative ³
Eradication	8	1,714	54,366	N/A	N/A	N/A
Total	28,704	58,094	303,143			

¹Except for samples confirmed for 10th infested field

²Except for samples confirmed for the 11th and 12th infested fields

³Except for samples confirmed for the 8th, 9th, 11th, and 12th 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

In ARS in Prosser, WA, the permit for the field use of a *Solanum sisymbriifolium* trap crop was filed and now waiting for approval, black nightshade (*S. nigrum*) also has shown hatching ability without nematode reproduction and two tests indicate that potato leaf extract may induce hatch. Also, hatching consistency has been observed in the purified diffusate. At the University of Idaho, the focus is on rearing cysts from the original field cysts instead of

the greenhouse reared cysts and obtaining consistency in cyst production and rearing and obtaining additional funding while they work on experiments for the ARS. ARS in Ithaca, NY, is continuing to test the transgenic lines of potato plants for resistance to golden nematode.

Eradication Activities

Methyl bromide was applied to six of the twelve infested fields in May 2011. The three fields that triggered bioassay in 2010 and the two fields detected in August and September 2011 did not receive methyl bromide treatments in 2011. The 10th infested field (detected March 2011) received its first methyl bromide treatment in October 2011.

Telone II was applied to six of the twelve infested fields in August 2011. Treatments are scheduled for October and November for the three fields currently in bioassay and the 10th infested field.

Historically, 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 third quarter of 2011, 8,118 acres of farmland became regulated due to their primary association with the 11th infested field. The fields associated with the 12th infested field are being identified and will be published in November 2011.

Regulatory Treatments

Treatment type	Regulatory Treatments (# of pieces of equipment)		
	3 rd Quarter of 2011	2011 Year to date	Since program inception
Pressure Washed	709	852	8,616
Steam Sanitized	56	215	1,400
Total	765	1,067	10,016

Regulatory Documentation

Documentation type	Regulatory Documentation		
	3 rd Quarter of 2011	2011 Year to date	Since program inception
Certificate (PPQ 540)	102	119	5,665
Limited Permit (PPQ 530)	91	92	1,277
New compliance agreements	0	4	140

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

July 18-29: The National Program Manager for Potato Cyst Nematodes, Jonathan Jones, was on site at the PCN Program. This detail provided an opportunity to participate in various local meetings with stakeholders, establish a better understanding of the day to day operations of the program, and review National PCN Survey protocols.

July 25: APHIS met with owners and farm operators of infested fields. Participants also included the Idaho State Department of Agriculture, Idaho Potato Commission, and a representative from U.S. Senator Mike Crapo's office. The purpose of the meeting was to discuss fall eradication treatment plans of infested fields and also to provide a general update on all program activities.

August 12: APHIS hosted two representatives from Senator Mike Crapo's office as they visited the PCN program in Idaho Falls. The purpose of the visit was to provide a program activity update to the Senator's office during the congressional recess.

Aug 31: PCN Program staff and Idaho SPHD participated in a joint Idaho potato commission/industry meeting in Sun Valley, Idaho. The purpose of the meeting was to discuss the ISDA's post-release monitoring survey.

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