



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

### 2012 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 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 eight PCN-infested fields have been found in Bingham and Bonneville Counties, Idaho. All 15 known infested fields lay within a 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 46,000 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, 31,600 acres have been released from federal regulation; however, approximately 2,500 acres have been re-regulated due to a new association with an infested field since its deregulation. Currently, 14,455 acres of farmland are regulated of which 1,756 acres 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 planting of biofumigants. 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. Since 2010, five infested fields have 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](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](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 <sup>st</sup> Quarter of 2012	2012 Year to date	Since program inception
Detection	3,937	3,937	167,728
Delimiting	1,679	1,679	165,422
Eradication	0	0	61,140
Total	5,616	5,616	394,290

## Identification and Diagnostics

Type of survey	Samples processed by the Idaho PCN Laboratory			Results		
	1 <sup>st</sup> Quarter of 2012	2012 Year to date	Since program inception	1 <sup>st</sup> Quarter of 2012	2012 Year to date	Since program inception
Detection	32,763	32,763	153,150	Negative <sup>1</sup>	Negative <sup>1</sup>	Negative <sup>2</sup>
Delimiting	8,159	8,159	153,306	Negative <sup>3</sup>	Negative <sup>3</sup>	Negative <sup>4</sup>
Eradication	3,510	3,510	60,043	N/A	N/A	N/A
Total	44,432	44,432	366,499			

Except for samples confirmed for the <sup>1</sup>15<sup>th</sup> infested field, <sup>2</sup>10<sup>th</sup> infested field, <sup>3</sup>13<sup>th</sup> and 14<sup>th</sup> infested fields, and <sup>4</sup>the 8<sup>th</sup>, 9<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> 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 <sup>1</sup>
Total	60,208	

<sup>1</sup>Except for samples confirmed for the first seven infested fields

## Program Research

Diapause experiment at U of I Moscow has been completed and found that 4 months was the optimal time for hatching of *G. pallida*. ARS in Prosser is bulking up *the Solanum sisymbriifolium* plants in tissue culture so that we have enough ready for Mike Thornton's field trial in Parma, Idaho, at the end of May. This trial will include both the wild type *S. sisymbriifolium* and the hairy root variant which had much greater root growth in multiple greenhouse trials. ARS in Ithaca has generated new forms of transgenic potato lines that may confer broad spectrum resistance to different PCN species/populations. These transgenic lines

were confirmed to have some degree of resistance to *G. rostochiensis* (GN). Testing for these lines for resistance to *G. pallida* will begin in the near future.

**Eradication Activities**

In May 2012, methyl bromide will be applied to six of the fifteen infested fields. The 5 infested fields currently in bioassay and the 4 infested fields with viability <1% will not be fumigated. Non-PCN host crops will be planted in all 15 infested fields. No Telone II treatments are scheduled for 2012.

Since 2007, methyl bromide has been applied to the infested fields annually in the spring and to one field in the fall of 2011. Telone II was applied in the late summer of 2007- 2008 and 2010-2011. Telone II was not used in 2009 due to a world-wide shortage of the 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 1<sup>st</sup> quarter of 2012, three fields were confirmed PCN-infested. Two of the fields were already regulated due to their association with the 10<sup>th</sup> infested field detected in 2011. The third, a 114-acre field, was added to the regulated area after it was confirmed PCN-infested. 1,179 acres of non-infested farmland were released from regulation after completing a series of surveys with no PCN detections. Another 123 acres were released when information was presented to the program demonstrating that these fields did not have a primary association with an infested field in the past 10 years.

**Regulatory Treatments**

Treatment type	Regulatory Treatments (# of pieces of equipment)		
	1 <sup>st</sup> Quarter of 2012	2012 Year to date	Since program inception
Pressure Washed	221	221	9,293
Steam Sanitized	20	20	1,453
Total	241	241	10,746

**Regulatory Documentation**

Documentation type	Regulatory Documentation		
	1 <sup>st</sup> Quarter of 2012	2012 Year to date	Since program inception
Certificate (PPQ 540)	216	216	6,043
Limited Permit (PPQ 530)	41	41	1,347
New compliance agreements	2	2	151

**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 fifteen 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**

On January 18, in Pocatello, ID, PCN Program staff presented PCN program information to participants at the annual Potato Conference and Ag Expo sponsored by the University of Idaho. Participants were from various aspects of the potato industry, including growers, packers, chemical representatives and researchers. A general update of the PCN program and good farming practices for PCN was also presented. Cooperators provided information on PCN research and the post-regulation monitoring survey conducted by the ISDA.

On January 19, in Boise, ID, PCN Program staff presented PCN Program information to participants of the annual Idaho Nursery and Landscape Association Horticulture Expo. A PCN Program update and a review of sanitation practices that help to prevent the spread of plant pests and diseases through the movement of soil were also given.

On January 20, in Idaho Falls, ID, PCN Program staff met with the infested field owners and operators to discuss the cooperative Federal/State PCN program. Representatives from the Idaho State Department of Agriculture (ISDA) and the Idaho Potato Commission (IPC) also attended the meeting. Participants discussed expected budget cuts to the program, additional detections of infested fields in 2011, and the potential effect on eradication efforts in 2012.

On February 24, in Idaho Falls, ID, PCN Program staff met with the infested field owners and operators to discuss the cooperative Federal/State PCN program. Representatives from the ISDA and the IPC also attended the meeting. Participants discussed plans for the 2012 eradication treatments and the three newest PCN-infested fields detected in February 2012.

On March 13 and 15, in Idaho Falls, ID, the PCN Program held the first in a series of training workshops designed for PCN Program stakeholders. Stakeholders and their employees were trained in best practices for PCN, proper equipment sanitation techniques and record keeping. Completion of the workshop enables stakeholders to self-certify their own sanitation jobs of equipment from non-infested, regulated fields under compliance agreement. More workshops are planned for 2012, in both English and Spanish, as needed.

March 20-22 in Idaho Falls, ID, representatives of APHIS from state, regional, and headquarters offices, the IPC, and the ISDA participated in a 5-year review of the PCN Program. The review team heard feedback from industry representatives and state/federal agencies, noting improved communication and analyzed the latest program data and input from technical experts. The goals established in 2006-07 are being met and will remain the program's focus in 2012 and beyond. The program will maintain successful strategies and modify certain processes to meet the industry's needs. Although federal funding for the program is limited, APHIS is committed to continuing the PCN Program to support the future of Idaho potatoes.

The next stakeholder update is due out in July 2012. Stakeholder updates are available at:

[http://www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/potato/pcn\\_stakeholder.shtml](http://www.aphis.usda.gov/plant_health/plant_pest_info/potato/pcn_stakeholder.shtml)