

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

2013 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 fourteen PCN-infested fields have been found in Bingham and Bonneville Counties, Idaho. All 21 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 51,100 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, 38,100 acres have been released from federal regulation; however, some of that acreage was re-regulated due to a new association(s) with an infested field(s). Currently, 13,053 acres of farmland are regulated, 2,300 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 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. To date, nine infested fields have triggered the bioassay stage of evaluating eradication progress when viable eggs were no longer detected in cysts collected from those fields. One of these fields has also successfully completed the bioassay process, enabling it to return to potato production with certain regulatory and survey requirements remaining in place. Bioassays for other fields are ongoing 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		
	3rd Quarter of 2013	2013 Year to date	Since program inception
Detection	5,907	10,008	205,972
Delimiting	5,798	9,461	222,051
Eradication	736	2,748	69,284
Total	12,441	22,217	497,307

Identification and Diagnostics

Type of survey	Samples processed by the Idaho PCN Laboratory		
	3rd Quarter of 2013	2013 Year to date	Since program inception
Detection	5,008	23,395	201,301
Delimiting	302	19,128	206,127
Eradication	0	2,012	67,451
Total	5,310	44,535	474,879*

*Additional samples added to previous years due to ongoing data reconciliation.

Type of survey	Samples processed at other Idaho laboratories	
	Idaho Food Quality Assurance Laboratory (2006-2009, now closed)	Idaho State Parma Research and Extension Center (2006-2009)
Detection	52,670	23
Delimiting	10,227	-
Total	62,897[†]	23[‡]

[†]2,689 samples were added due to ongoing data reconciliation.

[‡]This represents 2009 data only; data from previous years is undergoing reconciliation.

Program Research

Research is ongoing at the University of Idaho (Moscow, Parma, and Aberdeen campuses) to develop biological control agents and biofumigants against PCN, to elucidate genetic PCN immunity pathways, evaluate the effectiveness of Litchi Tomato (LT) as a trap crop for PCN, and determine agronomics for growing LT in southeast Idaho. Work continues at ARS-Prosser to develop favorable traits in LT for use as a trap crop, and to identify and characterize PCN hatching factors in potatoes, LT, and other non-solanaceous plants.

Eradication Activities

Since 2007, methyl bromide has been applied to the infested fields annually in the spring and was applied to one field in fall 2011. May 3-11, 2013, PPQ and the Idaho State Department of Agriculture (ISDA) collaborated to fumigate eight PCN-infested fields with methyl bromide (601 acres, total). This was the first methyl bromide treatment for two of the fields and the second treatment for the other six fields. 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

No changes have been made to the regulated area since May 2013. Total regulated area is 13,053 acres, 2,300 acres of which are infested fields.

Regulatory Treatments

Treatment type	Regulatory Treatments (# of pieces of equipment)		
	3rd Quarter of 2013	2013 Year to date	Since program inception
Pressure Washed	1,068	2,003	14,253
Steam Sanitized	68	201	2,024
Total	<i>1,136</i>	<i>2,204</i>	<i>16,277</i>

Self-Certification Program

Treatment type	Regulatory Treatments (# of pieces of equipment treated by qualified self-certifying program stakeholders)		
	3rd Quarter of 2013	2013 Year to date	Since program inception
Pressure Washed	323	729	1,982

Regulatory Documentation

Documentation type	Regulatory Documentation		
	3rd Quarter of 2013	2013 Year to date	Since program inception
Certificate (PPQ 540)	358	745	7,906
Limited Permit (PPQ 530)	123	268	2,039
New compliance agreements	1	4	159

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 nineteen 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 PCN Program collaborated with the Idaho Potato Commission (IPC) to build seven pressure-washing trailers that are available to stakeholders, free of charge, for performing their own sanitation treatments on equipment moving from non-infested regulated fields. Funding for the trailers was provided by a Farm Bill grant awarded to the IPC. The PCN Program designed and built the trailers and will provide upkeep and maintenance to them into future years. The trailers, put into use at the end of September, were an enormous benefit to stakeholders who were without PCN Program support during the 16-day government shutdown in October.

The next stakeholder update is due out in January 2014. Stakeholder updates are available at:
http://www.aphis.usda.gov/plant_health/plant_pest_info/potato/pcn_stakeholder.shtml