

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

### 2015 4<sup>th</sup> Quarter Report (October - December)

#### 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 nineteen PCN-infested fields have been found. All 26 known infested fields lay within a 7.5 radius spanning parts of northern Bingham and southern Bonneville Counties, Idaho. 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 52,500 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, 45,000 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, 9,999 acres are regulated, 2,897 acres of which are infested.

Eradication treatments in PCN-infested fields have been ongoing since the spring of 2007 and 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, 17 infested fields (1,939 acres) have triggered the greenhouse bioassay stage of evaluating eradication progress when viable eggs were no longer detected in cysts collected from those fields. Eight of the 17 fields (1,054 acres) have also successfully completed greenhouse bioassay testing, enabling them to return to potato production with certain regulatory and survey requirements remaining in place. Greenhouse bioassays for the other fields are ongoing at the University of Idaho in Moscow.

General PCN Program information can be found at: <http://www.aphis.usda.gov/planthealth/pcn>.

– Click on 'Regulated Fields Maps' under the heading "Quarantine Information" for a list of current and past regulated area maps.

– Click on 'PCN Regulations: 7 CFR 301.86' for the current Federal PCN rule, revised as of January 1, 2010.

### Survey Information

Type of survey	Idaho soil samples collected		
	4 <sup>th</sup> Quarter of 2015	2015 Year to date	Since program inception
Detection	4,348	5,117	229,775
Delimiting	4,127	8,522	257,746
Eradication	225	22,984	146,331
<b>Total</b>	<b>8,700</b>	<b>36,623</b>	<b>633,852</b>

### Identification and Diagnostics

Type of survey	Samples processed by the Idaho PCN Laboratory		
	4 <sup>th</sup> Quarter of 2015	2015 Year to date	Since program inception
Detection	4,741	10,154	235,159
Delimiting	5,286	8,141	249,263
Eradication	7,170	58,085	145,121
<b>Total</b>	<b>17,197</b>	<b>76,380</b>	<b>629,543</b>

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	69
Delimiting	10,227	896
<b>Total</b>	<b>62,897</b>	<b>965</b>

### 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. Additional information about U of Idaho PCN research can be found at: <http://www.uidaho.edu/cals/idahopcن>.

Work continues at ARS-Prosser to develop favorable LT traits to increase its appeal to growers for use as trap crop, produce LT seed for future field trials, and to identify and characterize PCN hatching factors in potatoes, LT, and other non-solanaceous plants.

**Eradication Activities**

Researchers at the University of Idaho and affected field growers planted Litchi tomato (LT), a trap crop for PCN, on three PCN-infested fields (132 acres) in May-June 2015. Overall, the litchi tomato project was a success. Growers and researchers at both the University of Idaho (UI) and the USDA’s Agricultural Research Service, learned a great deal about planting, growing, and controlling litchi tomato in southeast Idaho. Throughout the growing season UI researchers and Pale Cyst Nematode (PCN) program staff collected soil samples from the litchi tomato-treated fields. According to testing done at the APHIS PCN program, the LT treatment was responsible for reducing PCN viability in one field from 1% before LT to no detectable viability after the crop. Additional data from UI about LT effectiveness in the field trial is expected in 2016.

DOW Agrosiences sponsored a trial on a portion of an infested field to evaluate different application methods of the nematicide Telone II in October and November 2015. The PCN program applied Telone II to infested fields in 2007-8 and 2010-11, but its effectiveness against PCN was difficult to discern, as the treatments always followed a methyl bromide treatment. Dow Agrosiences suggested that infested field operators and owner sevaluate Telone II on a previously untreated field, using two different application methods under ideal field conditions. Dow Agrosiences donated chemical and cost of application to treat a total of 40 acres, and the field’s operator donated his time and equipment to prepare the treatment area prior to application. Both application methods reduced PCN viability by approximately 50%. With this encouraging news, the PCN program will consider adding this chemical back into its suite of eradication tools.

Methyl bromide has been applied to PCN-infested fields annually in the spring (2007-2014) and was applied to one field in fall 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), 2008 (clover), and 2009 (arugula).

**Regulatory Actions**

On December 22<sup>nd</sup>, approximately 317 acres of associated fields in Bonneville County were deregulated after completing a series of soil surveys with negative results for PCN.

**Regulatory Treatments**

Treatment type	Regulatory Treatments (# of pieces of equipment)		
	4 <sup>th</sup> Quarter of 2015	2015 Year to date	Since program inception
Pressure Washed	411	3,157	20,360
Steam Sanitized	37	264	2,693
<b>Total</b>	<b>448</b>	<b>3,421</b>	<b>23,053</b>

### Self-Certification Program

Treatment type	Regulatory Treatments (# of pieces of equipment treated by stakeholders participating in the self-certification program)		
	3 <sup>rd</sup> Quarter of 2015*	2015 Year to date*	Since program inception*
Pressure Washed	302	506	3,836

\*Self-certification data lags one quarter behind all other Program data in order to provide a stakeholder reporting period.

### Regulatory Documentation

Documentation type	Regulatory Documentation		
	4th Quarter of 2015	2015 Year to date	Since program inception
Certificate (PPQ 540)	128	953	9,823
Limited Permit (PPQ 530)	38	286	2,745
New compliance agreements	1	5	167

### 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 Mexico and Canada 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 Korea market was reopened in June 2010 with the exception of potatoes originating from Bingham and Bonneville Counties, Idaho. The Japan 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 twenty-six 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

General PCN Program information can be found at: <http://www.aphis.usda.gov/planthealth/pcn>.

– Click on [Program Updates](#) for the latest stakeholder update, due in spring 2016.

- No outreach activities to report.