United States Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine

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

2014 1st Quarter Report (January-March)

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, 42,600 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). The most recent update to the regulated area was published on January 10, 2014, when 2,297 acres of associated fields were deregulated. Currently, 8,478 acres 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.

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		
	1st Quarter of 2014	2014 Year to date	Since program inception
Detection	734	734	207,647
Delimiting	0	0	236,027*
Eradication	0	0	69,917
Total	***734***	***734***	***513,591****

*7 additional samples added to due to reconciliation of 2007-2009 data.

Identification and Diagnostics

Type of survey	Samples processed by the Idaho PCN Laboratory		
	1st Quarter of 2014	2014 Year to date	Since program inception
Detection	4,075	4,075	208,224
Delimiting	0	0	227,035
Eradication	1,369	1,369	68,820
Total	***5,444***	***5,444***	***504,079***

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
Total	***62,897***	***965***

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/idahopcn.

Work continues at ARS-Prosser to develop more-favorable LT traits to increase its appeal to growers for use as 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. 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).

Methyl bromide treatments are scheduled for April-May 2014 in 7 fields. This will be the first treatment for four fields and the second treatment for three fields.

Regulatory Actions

On January 10, 2014, the PCN program deregulated 2,297 acres of associated fields after they completed the requisite soil survey protocol. These changes bring the total regulated area to 8,478 acres, 2,300 acres of which are infested fields.

Regulatory Treatments

Treatment type	Regulatory Treatments (# of pieces of equipment)		
	1st Quarter of 2014	2014 Year to date	Since program inception
Pressure Washed	113	113	14,865
Steam Sanitized	26	26	2,108
Total	***139***	***139***	***16,973***

Self-Certification Program

Treatment type	Regulatory Treatments (# of pieces of equipment treated by qualified self-certifying program stakeholders)		
	4th Quarter of 2013*	2013 Year to date*	Since program inception*
Pressure Washed	158	903	2,157

*Self-certification data will lag one quarter behind all other Program data in order to accommodate stakeholder data reporting deadlines.

Regulatory Documentation

Documentation type	Regulatory Documentation		
	1st Quarter of 2014	2014 Year to date	Since program inception
Certificate (PPQ 540)	42	42	8,100
Limited Permit (PPQ 530)	36	36	2,120
New compliance agreements	1	1	160

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

- On January 23, in Pocatello, Idaho, PPQ participated in a meeting with various researchers involved with Pale Cyst Nematode (PCN) trials. Many of the trials involve developing non-chemical PCN eradication tools such as trap crops, hatching factors, bio-fumigants and bio-control. There was also an update provided on developing a PCN resistant variety of Russet Burbank potato. Much of the work is funded by Farm Bill Section 10201. Participants included Agricultural Research Service in Prosser, Washington and Corvallis, Oregon, and the University of Idaho in Parma, Aberdeen and Moscow, Idaho. Potato growers affected by the PCN regulations as well as their crop advisor also participated. The discussion involved covering results from all 2013 trials and determining priorities for 2014 trials.
- In February, the PCN Program held a series of meetings with an infested field grower group (~10 program stakeholders). The meetings focused on eradication treatment plans in 2014, viability and greenhouse bioassay results for their fields, and regulatory requirements for in-field bioassays.
- On March 19, the PCN Program provided a tour of the PCN laboratory to an Idaho Falls-based Cub Scout troop (ages 9-10 yrs.), which was followed by a question and answer session with PCN staff. The tour met the Scouts' requirement to visit a laboratory and speak with a scientist.

The next stakeholder update is due out in June 2014. Stakeholder updates are posted on the PCN Program webpage: http://www.aphis.usda.gov/planthealth/pcn by clicking the link to 'Stakeholder Updates'.