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 4th 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, 44,700 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, 7,734 acres are regulated, of which 2,897 acres 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, ten infested fields 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 ten fields 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		
	4th Quarter of 2014	2014 Year to date	Since program inception
Detection	6,568	17,745	224,658
Delimiting	7,234	13,197	249,224
Eradication	21,294	53,430	123,347
Total	***35,096***	***84,372***	***597,229***

Identification and Diagnostics

Type of survey	Samples processed by the Idaho PCN Laboratory		
	4th Quarter of 2014	2014 Year to date	Since program inception
Detection	7,167	20,856	225,005
Delimiting	12,037	14,087	241,122
Eradication	3,024	19,585	87,036
Total	***22,228***	***54,528***	***553,163***

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, 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

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). Seven fields were treated with methyl bromide in May 2014. This was the first treatment for four fields and the second treatment for three fields.

Regulatory Actions

On November 5, 2014, the PCN program announced the detection of a 140-acre field in Bingham County. The field was detected by ongoing cooperative monitoring by APHIS and the Idaho State Department of Agriculture (ISDA). Trace-work is underway to identify and sample other fields that have been exposed to soil from this infested field.

On December 29, 2014, the PCN program announced the deregulation of 2,094 acres of farmland that successfully completed the deregulation protocol for associated fields. The detection of three additional infested fields in Bingham County was also announced. A 77-acre and a 140-acre field were detected as part of ongoing cooperative monitoring efforts by APHIS and the ISDA. Both fields were farmed in association with other infested fields in the past. A 150-acre field, already under regulation since 2012, was detected by a routine delimiting survey. As a result of these infested field detections, an additional 994 acres of farmland in Bingham and Bonneville County were added to the regulated area due to their association with one of these infested fields.

Regulatory Treatments

Treatment type	Regulatory Treatments (# of pieces of equipment)		
	4th Quarter of 2014	2014 Year to date	Since program inception
Pressure Washed	764	2,413	17,177
Steam Sanitized	74	346	2,429
Total	***838***	***2,759***	***19,606***

Self-Certification Program

Treatment type	Regulatory Treatments (# of pieces of equipment treated by stakeholders participating in the self-certification program)		
	3rd Quarter of 2014*	2014 Year to date*	Since program inception*
Pressure Washed	348	562	3,123

*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 2014	2014 Year to date	Since program inception
Certificate (PPQ 540)	248	804	8,866
Limited Permit (PPQ 530)	53	372	2,458
New compliance agreements	0	0	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 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-two 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 January 2015.

- On October 28th, PPQ Idaho provided a pale cyst nematode update at the Idaho Potato Commission (IPC) meeting in Boise, Idaho. The update was delivered to the IPC commissioners that represent all aspects of the Idaho potato industry. This was the first meeting with three new commissioners and a number of new support staff. PPQ provided PCN program history, the current program status, and an update on the various non-fumigant eradication strategies being developed by university and federal researchers.
- On December 9th, the PCN Program held a meeting at the Idaho Falls IPC office with infested field owners and operators, and representatives of the ISDA and the IPC. PPQ staff provided a program update and discussed budget outlook and eradication treatment plans for 2015.
- On December 16th, PPQ Idaho held an annual PCN research review in Boise, Idaho. The review was attended by research staff from the University of Idaho and Agricultural Research Service, staff from the PPQ Center for Plant Health Science and Technology, ISDA and IPC, County Weed Superintendents, and operators of PCN-infested fields. Researchers provided progress reports on the non-fumigant eradication strategies being developed. A trap crop that is not a PCN host plant, but mimics a potato plant, commonly called 'Litchi tomato,' is tentatively planned to move from research trials to production on approximately 55 acres of PCN infested fields in 2015. Other strategies include developing hatching factors, biofumigants and a PCN-resistant variety of Russet potatoes.