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

2012 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 ten PCN-infested fields have been found in Bingham and Bonneville Counties, Idaho. All 17 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, 34,800 acres have been released from federal regulation; however, some of that acreage has been re-regulated due to a new association with an infested field(s) since its deregulation. Currently, 15,501 acres of farmland are regulated, 1,915 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. 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

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 2012	2012 Year to date	Since program inception
Detection	40	16,824	180,615
Delimiting	11,536	37,562	201,305
Eradication	392	3,550	64,690
Total	***11,968***	***57,936***	***446,610***

Identification and Diagnostics

Type of survey	Samples processed by the Idaho PCN Laboratory		
	3rd Quarter of 2012	2012 Year to date	Since program inception
Detection	1,674	51,258	171,645
Delimiting	16,046	24,527	169,678
Eradication	1,519	6,668	63201
Total	***19,239***	***82,453***	***404,524***

Type of survey	Samples processed by the Idaho Food Quality Assurance Laboratory
	Since program inception
Detection	49,984
Delimiting	10,224
Total	***60,208***

Program Research

There are a number of research initiatives occurring at the University of Idaho in Moscow. Dr. Dandurand's group is moving forward with hatching experiments with PCN on sticky nightshade. They also have some biocontrol experiments in progress and continue with bioassay work. The University of Idaho group in Parma is looking at seeding rates for sticky nightshade and the potential for planting sticky nightshade after spring/winter wheat. The Aberdeen University of Idaho station is also examining physical characteristics of sticky nightshade and the effects of potato herbicides on sticky nightshade.

The ARS in Prosser has been examining resistance of sticky nightshade to other potato pests, including root knot nematodes (4 different *Meloidogyne chitwoodi* pathotypes and races and *M. hapla*), viruses, and Colorado Potato Beetle. They are also working with the populations of *Globodera ellingtonae* as a model

for *G. pallida*. Hatching results with G. ellingtonae and G. pallida are very similar. ARS Prosser has also identified a new potential trap crop that will be going into pot tests for evaluation.

Eradication Activities

In May 2012, methyl bromide was applied to 6 of the 15 infested fields known at that time; a total of 653 acres were treated. The 5 infested fields currently in bioassay, and the 4 infested fields with viability <1% were not fumigated. Non-PCN host crops were planted in all 15 infested fields. No Telone II or methyl bromide treatments are scheduled for summer or fall 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

Since the last update to the PCN Regulated Area on July 9, 2012, approximately 1,064 acres were released from regulation under the Federal PCN Final Rule (effective April 29, 2009). Approximately 271 acres were released after completing a deregulation protocol (comprised of a sequence of surveys with negative laboratory results for PCN); approximately 793 acres were released after additional field data indicated that these fields did not meet the definition of 'associated field.'

Regulatory Treatments

Treatment type	Regulatory Treatments (# of pieces of equipment)		
	3rd Quarter of 2012	2012 Year to date	Since program inception
Pressure Washed	1,356	2,431	11,560
Steam Sanitized	76	215	1,650
Total	***1,432***	***2,646***	***13,210***

Regulatory Documentation

Documentation type	Regulatory Documentation		
	3rd Quarter of 2012	2012 Year to date	Since program inception
Certificate (PPQ 540)	283	773	6,911
Limited Permit (PPQ 530)	120	278	1,672
New compliance agreements	0	5	154

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 seventeen 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 July 6, PPQ met with the infested field owners and operators to discuss research options for non-chemical PCN control methods, the bioassays underway at the University of Idaho, PCN Program budget and funding outlook for FY13, and coordinating harvest plans for the infested fields this year.
- In July, the PCN Program held additional self-certification training courses for two local farming operations. This training allows the grower to self-certify sanitation of his farming equipment leaving regulated fields. For more information about the self-certification program, please contact the program office at (208) 522-2431.

The next stakeholder update is due out in January 2013. Stakeholder updates are available at:
http://www.aphis.usda.gov/plant_health/plant_pest_info/potato/pcn_stakeholder.shtml