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

2011 2nd 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 spread 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 three PCN-infested fields were found in Bingham and Bonneville Counties, Idaho. The ten PCN-infested fields lay within a roughly three mile radius and the fields associated with them through shared tenancy, farming practices, equipment, and/or shared borders have been extensively surveyed and regulated. Since program inception, a total of 30,917 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, 29,653 acres have been released from federal regulation. Currently, 7,405 acres of farmland are regulated, of which 1,264 acres are infested fields.

Eradication treatments of PCN-infested fields have been ongoing since the spring of 2007. Eradication treatments have included methyl bromide fumigation, Telone II fumigation, and biofumigant plantings. 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. In 2010, three infested fields triggered bioassay when no viability was detected in cysts collected from those fields. Bioassays for the three fields 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		
	2nd Quarter of 2011	2011 Year to date	Since program inception
Detection	11,297	11,741	129,857
Delimiting	15,037	15,037	145,091
Eradication	3,394	3,394	56,879
Total	*29,728*	*30,172*	*333,827*

Identification and Diagnostics

Type of survey	Samples processed by the Idaho PCN Laboratory			Results		
	2nd Quarter of 2011	2011 Year to date	Since program inception	2nd Quarter of 2011	2011 Year to date	Since program inception
Detection	9,001	27,684	100,464	Negative[1]	Negative[1]	Negative[2]
Delimiting	0	0	119,617	N/A	N/A	Negative[2]
Eradication	1,706	1,706	54,358	N/A	N/A	N/A
Total	*10,707*	*29,390*	*274,439*			

[1]Except for samples confirmed for tenth infested field
[2]Except for samples confirmed for the eighth, ninth, and tenth infested fields

Type of survey	Samples processed by the Idaho Food Quality Assurance Laboratory	
	Since program inception	Results
Detection	49,984	Negative
Delimiting	10,224	Negative[1]
Total	*60,208*	

[1]Except for samples confirmed for the first seven infested fields

Program Research

Numerous hatching assays are underway in Moscow, Idaho, that are measuring hatching activity in fractions from two different HPLC columns, different plant tissues and potential trap crops. There is a single potential candidate plant that had activity from among over 100 non-solanaceous plants evaluated thus far for hatching activity. There is a need to confirm that this is legitimate and reproducible by using new exudate from new plants. Also working on a sterile hairy root suspension cultures that we can then scale up to evaluate whether these are a rich source of hatching factors. Bioassay tests are beginning again in Moscow. ARS-Ithaca is testing additional transgenic potato lines against *G. pallida* and *G. rostochiensis*.

Eradication Activities

Methyl bromide was applied to six of the ten infested fields in May 2011. The three fields that triggered bioassay in 2010 did not receive methyl bromide treatments in 2011. The 10th infested field (detected March 2011) will receive its first methyl bromide treatment in September 2011.

Historically, methyl bromide was applied to the infested fields in the spring of 2007, 2008, 2009, and 2010. Telone II was applied in the late summer of 2007, 2008, and 2010. Telone II was not applied in 2009 due to a world-wide shortage of this chemical. Biofumigants with nematicidal activity were planted in the infested fields in the summers of 2007 (oil radish) and 2009 (arugula).

Regulatory Actions

In the second quarter of 2011, 6,141 acres of farmland became regulated due to their primary association with the 10th infested field.

Regulatory Treatments

Treatment type	Regulatory Treatments (# of pieces of equipment)		
	2nd Quarter of 2011	2011 Year to date	Since program inception[1]
Pressure Washed	136	144	7,453
Steam Sanitized	563	576	1,761
Total	*21*	*21*	*8,515*

[1]A review of sanitation data is underway while new data collection and management tools are developed.

Regulatory Documentation

Documentation type	Regulatory Documentation		
	2nd Quarter of 2011	2011 Year to date	Since program inception[1]
Certificate (PPQ 540)	102	119	5,665
Limited Permit (PPQ 530)	91	92	1,277
New compliance agreements	4	4	140

[1]The review of PPQ 540 issuance data has been completed. A review of PPQ 530 issuance data is underway.

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 nine 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

A meeting between the PCN Program, ISDA, the Idaho Potato Commission, and the infested fields' owners and operators was held at the PCN Program office in July. The purpose of the meeting was to discuss the plowing under of the summer biosecurity cover and fumigation plans for later this year.

The program expects to conduct Telone II treatments in the 10 infested fields later this summer. A methyl bromide application is planned for the 10th infested field this fall.

The map of the regulated area was updated in May and June 2011 to show the locations of current regulated and infested fields.

The next stakeholder update is due out in September 2011. Stakeholder updates are available at:
http://www.aphis.usda.gov/plant_health/plant_pest_info/potato/pcn_stakeholder.shtml