

Operational Guidelines
U.S. – Korea Table Stock and Chipping Potato Protocols
March 2018

This document provides guidance on the operational aspects of the Table Stock and Chipping protocols for the export of potatoes to Korea from the states of Idaho, Oregon and Washington. It is to be used in conjunction with the current versions of the protocols (dated December 11, 2017) as found in PExD.

Facility Registration and responsibilities

- **Registration**

Packing/shipping facilities intending to participate in the protocols must be registered with USDA/APHIS. Facility letters of interest and compliance (Attachment 2) must be filled out and submitted to Potatoes USA (Ms. Amy Burdett) no later than April 1st of the year that the potatoes will be grown*.

*Facility letters of interest may be submitted until May 1st for the 2018 harvest.

Contact information: Amy Burdett amy@potatoesusa.com

- **Responsibilities**

- a. Maintain and verify a grower list and all associated paperwork for the program (grower letter of compliance, trapping records, lab tests, etc.)
- b. Apply sprout inhibitor to potatoes for export to Korea according to the schedule found in the protocol.
- c. Issue a treatment certificate (Packer Affidavit) using the form in attachment 1 of the protocol.
- d. For tablestock potatoes facilities must have and maintain fry test capabilities (personnel and equipment).

Grower Registration and responsibilities

- **Registration**

Growers intending to participate in the protocols must complete a grower letter of compliance (Attachment 3) and submit it to their packing facility within two weeks of planting each year.

- **Responsibilities**

- Implement "Integrated Pest Management Guidelines for Insects and Mites in Pacific Northwest Potatoes" during the growing season.
- Monitor insect vectors based on trapping/survey protocol, and apply controls for registered fields.
- Lab test vectors collected in sticky traps for infection of Zebra Chip pathogen.
- If a potato psyllid is confirmed positive for the Zebra chip pathogen:
 - Exclude the **Table Stock** field(s) from which the psyllid was collected from exports to Korea.
 - Immediately notify APHIS of any **Chipping Potato** field(s) from which the psyllid was collected.
- Use only certified seed potatoes produced in the Pacific Northwest or a currently approved state that meets the seed potato certification standard as required by Korea.

Approved Seed

- Table stock potatoes exported to Korea must be grown using certified seed from an approved state. These include the Pacific Northwest states, along with several other states, most of which do not produce seed potatoes. The **approved seed states** are:

Alabama	Georgia	Iowa	New Jersey	Vermont
Alaska	Hawaii	Kentucky	Oregon	Virginia
Arkansas	Idaho	Louisiana	Rhode Island	Washington
Connecticut	Illinois	Massachusetts	South Carolina	
Florida	Indiana	Missouri	Tennessee	

- For PNW seed to be used for growing table-stock potatoes for export to Korea the seed must not exceed the new LSO/Zebra Chip tolerance now in the seed certification regulations for these three states.

Implementation of Integrated Pest Management (IPM) Guidelines

- Table-stock potatoes to be exported to Korea must be grown according to IPM guidelines for Insects and Mites in Pacific Northwest Potatoes (Attachment 6).

Trapping / Survey requirements for potato psyllid

- Growers must trap for potato psyllid – four traps per 50-hectare (123.5 acres) production field (at least 10 traps per field if zebra chip was detected in the year prior). For field sizes greater than 50 hectares, growers must place one additional trap for every 10 hectares (1 Hectare = 2.47 acres).
- Trap placement and weekly replacement may be done by the grower, pest control consultant, or research personnel.
- Traps used will be yellow sticky traps as outlined in the “Insect Trapping Guide” produced by the Northwest Potato Research Consortium (Attachment 4). Traps will be replaced at intervals of once a week.
- Initial Trap placement date shall be no later than two weeks after sprouting (emergence) or as outlined in the Insect Trapping Guide.
- The traps must be examined for psyllids and replaced on a weekly basis. Records of trap monitoring shall be kept and provided to APHIS (a copy shall be kept at the packing facility and available to APHIS and State Officials) in accordance with the Northwest Potato Research Consortium’s ‘Insect Trapping Guide.’ Please contact Dr. Andrew Jensen (potato commission) for details: ajensen@potatoes.com.
- In the case that vectors are found, growers shall apply insecticide in accordance with the IPM guidelines.
- Insecticide applications shall also be initiated when psyllids are first detected as part of the PNW survey in that production area.
- All vectors must be sent to a laboratory to test for the presence of zebra chip (Attachment 7).
- If zebra chip is confirmed in a field, there are also significant additional requirements for contiguous fields that are destined for Korea. A contiguous field is a field that is touching another field. (Fields on other sides of roads are not considered contiguous.)
- For fields contiguous to a ZC positive field, 17 traps per 50 hectares must be placed in four directions within the field until the end of the export season. If the field exceeds 50 hectares, four additional traps (one for each direction) per 20 hectares (49.4 acres) must be placed. Surveillance shall be implemented through leaf sampling and vacuum sampling per the IPM guidelines in 10 points at the edge of the contiguous fields where ZC pathogen was detected in vectors (See Attachment 5).

Sprout Inhibition

- Export facilities shall, before shipping, apply sprout inhibitor to potatoes (both chipping and table stock) according to the following schedule and issue a treatment certificate (packer affidavit) (Attachment 1).

Chemical	Type	Active ingredient	Dosage
Chlorpropham (CIPC)	Oil emulsion	1%	1 quart per 2,000LBS of potato

Inspection and Certification of Potatoes Prior to Export

- Authorized Certification Officials (ACO's) will **sample** consignments of potatoes during export inspection. The samples will be cut according to the sampling standards found below and visually inspected for symptoms of zebra chip disease.
- **Table stock** potato shipments (**not required for chipping potato shipments**) will also be subject to a fry test. Five percent of the inspection sample will be cut crosswise into 1-2 mm thick chips and deep fried at 191 degrees Celsius (375° F) for three minutes. Facilities must provide and maintain fry test capabilities (personnel and equipment).

Sampling Standards:

Composition of consignment	Amount of sample collection	Amount of sample collection for conducting frying test (5%) for table stock
Composed of 1 container	300 potato tubers	15 potato tubers
Composed of more than 1 container	200 potato tubers per container	10 potato tubers per container

- Growers must allow 21 days between vine kill and visual inspection/fry test.
- If zebra chip is found within the sample, exports of potatoes from the entire field will be suspended for the remainder of the export season.

- **The Phytosanitary Certificate (PC) for the export of table stock potatoes** must include the following Additional Declarations (AD's):

"The potatoes in this consignment were grown from certified seed potatoes meeting the seed potato certification standard in the State of _____"

AND

"This consignment has been inspected and found to be free from zebra chip disease through visual inspection and the frying test of cut tubers."

AND

The ACO will write the Phytosanitary Certificate number on the treatment certificate (Packer Affidavit) after checking the sprout inhibitor application record or include the AD, *"This shipment of potatoes for processing from the State of _____ has been treated with an approved sprout inhibiting chemical before shipping."*

- **The Phytosanitary Certificate (PC) for the export of chipping potatoes** shall include the code number of the production field(s) and the following Additional Declarations (AD's):

"This consignment has been found to be free from zebra chip diseases through the inspection of cut tubers."

AND

The ACO will write the Phytosanitary Certificate number on the treatment certificate (Packer Affidavit) after checking the sprout inhibitor application record or include the AD, *"This shipment of potatoes for processing from the State of _____ has been treated with an approved sprout inhibiting chemical before shipping."*

Import Inspection

- **Shipments of table stock potatoes** will be subject to an import inspection at the port of entry in Korea.
 - If the causal agent of zebra chip (*Candidatus Liberobacter Solanacearum*) is detected during import inspection, the shipment will be rejected or destroyed and the import of potatoes from the entire state will be suspended, pending further investigation and appropriate action to address the issue. If the detection of ZC disease continues, the import requirements for PNW potatoes may be suspended and reviewed.
 - If other quarantine pests are detected, they shall be subject to Korea's Plant Protection Act.
- **Shipments of chipping potatoes** will be subject to an import inspection at the port of entry in Korea.
 - If the causal agent of zebra chip (*Candidatus Liberobacter Solanacearum*) is detected during import inspection, the shipment will be rejected or destroyed and the import of chipping potatoes from the fields where the consignment was produced will be suspended until the cause is identified and the problem is addressed. If the detection of ZC disease continues, the import requirements for PNW potatoes may be suspended and reviewed.
 - If other quarantine pests are detected, they shall be subject to Korea's Plant Protection Act.

On-site survey

- During the initial 2018 export season, Korea will send inspectors to conduct an on-site survey to assess the potato export program. Subsequent visits may be conducted every five years.

Attachment 1

(Shipper Letterhead)

EXPORT TO KOREA

This shipment of potatoes from the State of _____ has been treated with sprout inhibitor at the recommended rate

Packer Affidavit

I certify that the potatoes submitted for inspection for export to Korea have been treated with *(one quart of 1% active ingredient emulsion of chlorpropham per 2000lbs of potatoes)* before shipping.

Packer: _____

Signature: _____

Date: _____

Phytosanitary No.: _____

Inspector

Date

Commodity Inspection Division

Attachment 2

U.S. Table Stock and Chipping Potatoes to Korea Export Programs

Facility Letter of Interest and Compliance

_____ **Growing Season**

Facility Name: _____
Street Address: _____ City: _____ State: _____
Mailing Address: _____ City: _____ State: _____
(1) Contact Person: _____ Phone: _____ Mobile: _____
(2) Contact Person: _____ Phone: _____ Mobile: _____

This facility is interested in shipping (Table Stock___) (Chipping___) potatoes to Korea.

As an export facility interested in exporting to Korea I will follow the protocol and attest to implementing the following requirements of the U.S. Table Stock/Chipping Potatoes to Korea Export Programs;

- (a) Maintain and verify a grower list and all associated paperwork for the program (grower letter of compliance, trapping records, lab tests, etc.).
- (b) Apply sprout inhibitor to potatoes for export to Korea according to the schedule found in the protocol.
- (c) Issue a treatment certificate (Packer Affidavit) of the form in attachment 1 of the protocol.
- (d) For table stock potatoes facilities must have and maintain fry test capabilities (personnel and equipment).

Signed BY: _____ Date: _____
Owner/Manager

Printed Name and Title: _____

Attachment 3

U.S. Table Stock and Chipping Potatoes to Korea Export Programs

Grower Letter of Compliance

_____ **Growing Season**

Grower Name: _____
Street Address: _____ City: _____ State: _____
Mailing Address: _____ City: _____ State: _____
(1) Contact Person: _____ Phone: _____ Mobile: _____
(2) Contact Person: _____ Phone: _____ Mobile: _____
Packing Facility: _____

As a potato grower interested in exporting to Korea I attest to implementing the following requirements of the U.S. Table Stock/Chipping Potatoes to Korea Export Programs;

- (a) Implemented "Integrated Pest Management Guidelines for Insects and Mites in Pacific Northwest Potatoes" during the growing season for the registered fields referenced below.
- (b) Monitored for insect vectors and applied controls for the registered fields referenced below, using yellow sticky traps installed at least 4 traps per 50 hectares (for fields larger than 50 hectares 1 additional trap was placed for every additional 10 hectares) per production field and at least 10 traps per field in the case Zebra Chip occurred the previous year.
- (c) Replaced the yellow sticky traps at intervals of once a week (Trapping must begin no later than two weeks after sprouting/emergence or as outlined in the Insect Trapping Guide).
- (d) Lab tested vectors collected in sticky traps for infection of Zebra Chip pathogen.
- (e) Excluded table stock field(s) that has(have) tested positive for Zebra Chip pathogen from export to Korea.
- (f) Immediately notify APHS of any Chipping Potato field(s) from which the psyllid was collected.
- (g) Used only seed potatoes produced in the Pacific Northwest or currently approved state that meets the seed potato certification standard as required by Korea.
- (h) Trapping and testing records as well as seed potato source documentation **MUST** be on file with the packing/shipping facility. Pesticide application records must be made available upon request.

Signed BY: _____ Date: _____
Owner/Manager

Printed Name and Title: _____

Physical Location(s) Of Registered Potato Fields and Associated Grower/Field Identification Numbers

	Location of Registered Field	Grower/Field ID	Hectares	Number of traps per field	State seed potatoes sourced from
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
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27.					
28.					
29.					
30.					
31.					
32.					
33.					
34.					
35.					
36.					
37.					
38.					
39.					
40.					
41.					
42.					
43.					
44.					

Attachment 4

Potato Psyllid Labeling and Sampling Protocol

University of Idaho (prepared for Consultants)

Materials:

- Sticky Traps & Wax Paper to cover the traps (4"x6")
- Wood Stakes (4"x2")
- Large Binder Clips (1" capacity)
- Permanent Markers (Ultra-Fine Point)
- Zipper Closure Bags (Gallon size)

Labeling: (All traps will be labeled when you receive them)

This is how sticky traps labels will look:

Left Side

Site#, Consultant Name, Field Name, & Trap (N,S,E,W)

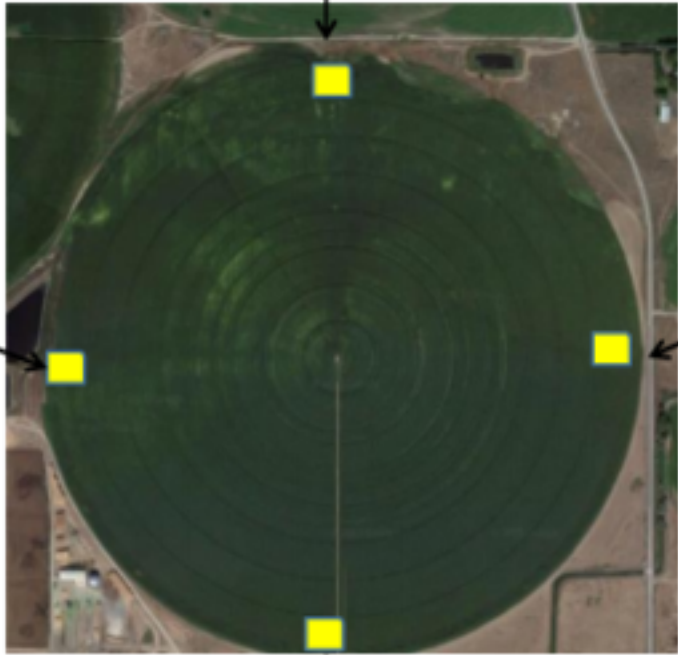
Right Side

Retrieve Week# & Date

Sampling Procedure:

- Each designated site/field will be given a name which will be its identity for the remainder of the sampling season. This name will be used to label sticky traps and for our data files.
- Each site/field should have four spots evenly placed around the entire field where the stakes will be placed in the ground for the entire sampling season. There needs to be one stake with sticky trap labeled "N" placed at the north side of the field, one labeled "E" at the east side, one labeled "W" at the west side, and one labeled "S" at the south side.
- All sticky traps are labeled either N, S, E, or W and will remain the same for the entire season.
- Each stake will have a sticky trap attached to them with a large binder clip.
- These stakes should be about ten feet in from the edge of the field.
- Sticky traps need to be oriented perpendicular to the stake with the labeled side facing out from the field.
- Both sides of the trap will have their wax paper removed and kept for retrieval.
- Sticky traps need to be placed on the stake just above the potato foliage and needs to be moved vertically along the stake as the foliage grows taller or falls lower.
- Sticky traps are changed the same day, every week.
- Used sticky traps are to be covered with the previously saved wax paper (waxy side of paper goes on the sticky side of the sticky card). Sticky traps need to be placed in a zipper closure bag and stored in a freezer (when possible).
- The date that traps are set out and the date that traps are retrieved needs to be clearly written on each set of traps for each site/field.

N trap



W trap

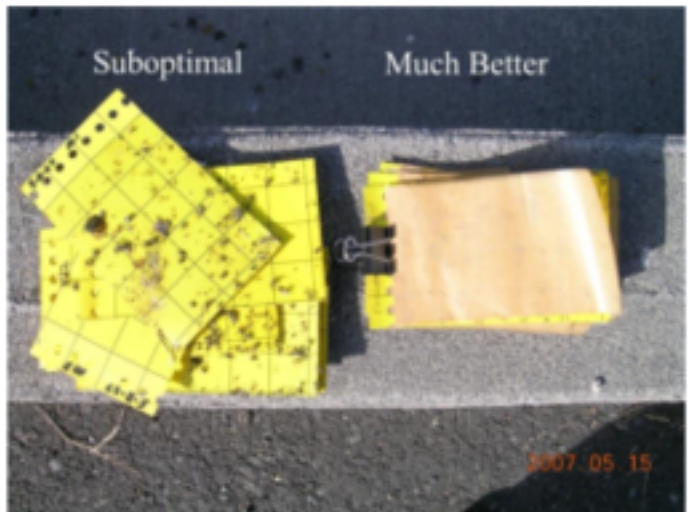
E trap

S trap

Proper trap placement



Proper trap retrieval



Checking the Traps

Ideally, traps should be checked at least every few days. Traps should be changed once a week, or whenever they become covered in insects, dirt, feathers, hair, dead lizards, etc.

Potato Psyllid Features and Size



Potato psyllid

White rim on top of head

White bands on otherwise dark abdomen



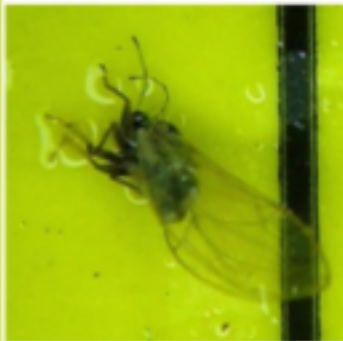
Psyllid adults and nymphs on a penny for size comparison



Psyllids don't always look their best on traps

Wings are clear, without markings

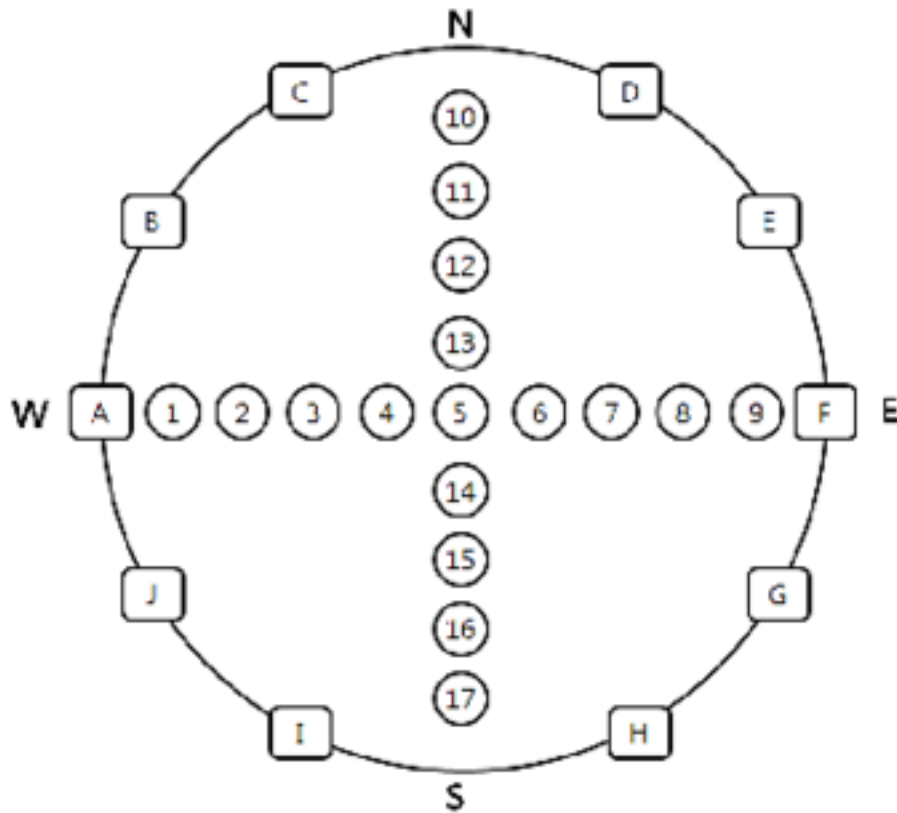
Three-way branch in wing vein



Attachment 5

Trapping and Sampling Locations for Contiguous Fields

The diagram below details the trapping and sampling locations for fields contiguous to a field that has tested positive for zebra chip. (Note: Fields on other sides of roads are not considered contiguous.)



- Circles 1-17(17points): Locations for yellow sticky traps
- Squares A-J(10points): Locations for leaf and vacuum sampling

Attachment 6

IPM Guidelines for Insects and Mites in Pacific Northwest Potatoes

<http://www.nwpotatoforresearch.com/pest-library/pest-management-options/>

www.nwpotatoforresearch.com/pest-library/pest-management-options/

A Consortium for the States of WA, OR and ID

Northwest Potato Research Consortium

Home - Research Library - Consortium Info - Insect Library - Disease Library - Nematodes - Beneficial Organisms - Resources - Contact

Home / Pest Library / Pest Management Options

Pest Management Options

Insects and Other Arthropods

We suggest that growers and others access management suggestions in two places. First is the [Integrated Pest Management Guidelines for Insects and Mites in Idaho, Oregon and Washington Potatoes](#).

Second is the [IPM Insect Management Handbook](#), published annually by Oregon State University, University of Idaho, and Washington State University. The entire book can be accessed online at: <http://ipm.wsu.edu/insects>.


Plant Pathogens and Nematodes

A starting point for many diseases is the [Pacific Northwest Plant Disease Management Handbook](#).

Another option is this [set of resources](#) presented by the Pacific Northwest Vegetable Extension Group.

Please check back here, or watch your regional potato newsletters, for news on our research results and new management options.

[Click the image below for a larger picture and description.](#)



PTM Trap

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- Potato Progress (NWIS) - 26-03-2016
- Potato Progress (NWIS) - 06-03-2016
- Potato Progress (NWIS) - 01-03-2016

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Attachment 7

Approved laboratories for analysis of psyllids

- University of Idaho
CONTACT: Dr. Alex Karasev
PHONE: 208-885-2350
EMAIL: akarasev@uidaho.edu
MAILING ADDRESS: Dept. of Plant, Soil and Entomological Sciences, University of Idaho,
Moscow, Idaho 82339.
- Hermiston:
<http://oregonstate.edu/dept/hermiston/plant-pathology-plant-lab-testing>
Plant or soil samples can be submitted to the lab by either bringing the sample
directly to the HAREC Plant Pathology Lab or the HAREC Main office or by
mailing samples to:
Robert Cating
OSU Extension Plant Pathology Lab
HAREC
2121 South 1st Street
Hermiston, OR 97838
- Parma Research and Extension Center: <https://www.uidaho.edu/cals/entomology-plant-pathology-and-nematology/our-people/james-woodhall>
PHONE: 208-722-6701
EMAIL: jwoodhall@uidaho.edu
MAILING ADDRESS
Parma Research and Extension Center
29603 U of I Lane
Parma, ID 83660-6699
- WSU Pullman: <https://plantpath.wsu.edu/diagnostics/>
Plant Diagnostician
 - Rachel Bomberger, M.S.
 - (509) 335-3292
 - rachel.bomberger@wsu.edu

Shipping Information

Clinic USPS mailing address:

Plant Pest Diagnostic Clinic

Department of Plant Pathology

P.O. Box 646430

Pullman, WA 99164-6430

Clinic UPS and FedEx address:

Plant Pest Diagnostic Clinic

345 Johnson Hall, 100 Dairy Road

Pullman, WA 99164