IDAHO STATE DEPARTMENT OF AGRICULTURE (ISDA)
DIVISION OF PLANT INDUSTRIES

2017 END OF YEAR SURVEY RESULTS FOR PLANT PESTS, INVASIVE SPECIES, NOXIOUS WEEDS, PLANT LAB, NURSERY, AND FIELD INSPECTION PROGRAMS

INTRODUCTION

ISDA's Division of Plant Industries derives its statutory authority from multiple sections of Idaho Code, Title 22, including the Plant Pest Act, the Noxious Weed Law, the Nursery and Florist Law, and the Invasive Species Act. These laws give the Division of Plant Industries clear directives to conduct pest surveys and manage invasive species and plant pests for the purpose of protecting Idaho's agricultural industries valued at over $4 billion; which include crops, nursery, and ranching. The Division of Plant Industries also cooperates with other agencies including the Idaho Department of Lands (IDL), the University of Idaho (UI), the United States Forest Service (USFS), the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Services (APHIS), Plant Protection and Quarantine (PPQ), county governments, Cooperative Weed Management Areas (CWMA), industry groups, and other stakeholders to protect Idaho's landscapes and environments from invasive species. Finally, the Division of Plant Industries helps accomplish the ISDA's broader mission to "serve consumers and agriculture by safeguarding the public, plants, animals, and the environment through education and regulation." This report summarizes the comprehensive and cooperative programs conducted during 2017 to enforce Idaho statutes and fulfill the mission of ISDA.

PEST SURVEYS

APPLE MAGGOT (AM) (*Rhagoletis pomonella* (Walsh)

In 1990, ISDA established by administrative rule an AM-free regulated area (the "Apple Maggot Free Zone" or AMFZ), encompassing the major apple production areas of the state. Every year, ISDA conducts an area-wide survey for AM using sticky yellow panel traps with ammonium carbonate bait.

Photo by Phil Huntley-Frank, ***bugguide.net***

County	Total number of AM traps placed	Positive AM traps	Negative AM traps
Boundary	20	0	20
Canyon	120	0	120
Gem	64	1	63
Owyhee	33	0	33
Payette	41	0	41
Washington	34	2	32
TOTAL	**312**	**3**	**309**

In 2017, 312 traps were placed in commercial apple orchards and home landscape trees in Boundary, Canyon, Gem, Owyhee, Payette, and Washington Counties. Specimens suspected of being AM were confirmed by the ISDA entomologist. This year we had 3 positive sites for AM, two of the positive sites were in Washington County and were located within the established AMFZ. There was also one positive trap in Gem County that was located within the AMFZ. All AM specimens collected within the AMFZ were found on traps that were placed in apple trees in non-commercial settings.

Gem and Washington counties are both considered partially infested and regulated under a state interior quarantine (http://adminrules.idaho.gov/rules/current/02/0608.pdf).

During 2018, ISDA will continue to conduct detection surveys in the six-county area. In Gem and Washington counties, ISDA will set out supplementary detection traps around the positive locations. See page 43 of this report for a map of 2017 AM survey activity in Idaho.

BROWN MARMORATED STINK BUG (BMSB) (*Halyomorpha halys* Stal)

Photo by Susan Ellis, Bugwood.org

Brown Marmorated Stink Bug (BMSB) is an invasive insect pest native to Asia. In the U.S., it was first detected in Allentown, PA in 1998 and has since spread to over 40 states. BMSB is an agricultural pest that feeds on a wide range of tree fruits, seed pods and vegetables including apples, peaches, green beans, peppers and corn. For homeowners, it is mainly a nuisance pest as it can invade houses in vast numbers during the fall looking for a place to overwinter.

In 2012, ISDA was notified of an accidental introduction of BMSB into the state when new residents in Nampa (recently moved from Maryland), noticed several stink bugs emerging from containers of belongings while unpacking. A few were captured and the identification verified, however, it was believed that some did escape. Follow up visual inspections of the area during 2012 and 2014, as well as pheromone trapping in 2014, failed to turn up any BMSB so it was concluded, at that time, that a population did not successfully establish there. In October 2014, a single BMSB specimen was captured and confirmed from a garage in a Boise neighborhood – the first ever reported in Ada County.

Since then, several collections of BMSB in the state have been confirmed every year. The majority have been found in Ada County and a lesser number in Canyon County. In most cases single individuals have been discovered, usually in or on residential structures. In three instances two bugs were collected at a single location, and during 2015, at one Boise home multiple individuals were found inside a dwelling, but the majority were dead. Follow-up inspections outside of the house on the building and foliage in the yard failed to turn up any other living or dead BMSB.

During the summer/fall of 2017 four BMSB were found in Japanese Beetle pheromone traps in downtown Boise, the first BMSB (single individuals) were confirmed from Nez Perce County (Lewiston on July 19) and Payette Co. (Sand Hollow on November 28), five more were collected at residences in Ada County (Boise and Meridian); as well as four in Canyon County (Nampa and Middleton). See map on page 44.

WESTERN CHERRY FRUIT FLY (WCFF) (*Rhagoletis indifferens* Curran)

ISDA routinely conducts an annual trapping program to detect first emergence of Western Cherry Fruit Fly. In 2017, WCFF adults were first observed in ISDA sentinel traps on May 24 near Caldwell, in Canyon County, and shortly thereafter on June 7 near Emmett, in Gem County. The agency also tracks degree-day accumulation calculations as required by the California Department of Food and Agriculture (CDFA) to comply with their WCFF quarantine, which is aimed at states wishing to export fresh sweet cherries into or through California (see table below).

2013-2017 Degree-day accumulations relevant to the start of pesticide treatment for WCFF

Site	*2017*	*2016*	*2015*	*2014*	*2013*
		Historical 1060 degree day accumulation forecast dates			
Boise	May 28	May 17	June 4	June 1	June 2
Caldwell	May 27	May 19	May 29	June 1	May 26
Nampa	May 26	June 21	June 5	June 1	May 31
Ontario	May 25	May 17	May 25	June 1	May 30
Parma	May 25	June 2	June 4	May 30	June 4
Emmett	May 27	May 24	June 9	June 2	May 28

EUROPEAN PINE SHOOT MOTH (EPSM) (*Rhyacionia bouliana* Denis & Schiffermuller)

The Idaho European Pine Shoot Moth survey is conducted annually and complies with California and Montana quarantines. In 2017, ISDA staff placed 72 EPSM traps in nurseries and pine tree plantations throughout the 12 Idaho counties in which EPSM have never been detected to date. In addition, at the request of nurseries seeking phytosanitary data to allow export of nursery stock, traps were set out and monitored in two counties where EPSM had been captured in the past. No newly confirmed infested counties were reported in 2017. Finding effective control regimes and complying with Montana and California EPSM quarantines continue to challenge this segment of the Idaho nursery industry. A map of Idaho counties historically positive for EPSM is located on page 45 of this report.

GYPSY MOTH (GM) (*Lymantria dispar* (Linnaeus))

During 2017, 3,754 Gypsy Moth survey traps were deployed throughout Idaho. The number of traps placed by each agency is as follows:

- Idaho Department of Lands (IDL): 2,480 detection/36 delimit traps
- Idaho Department of Agriculture (ISDA): 657 detection traps
- United States Forest Service R-1(USFS): 78 detection traps
- United States Forest Service R-4 (USFS): 467 detection/36 delimit traps

Photo by: Phil Nixon, Entomologist, University of Illinois

Between May 1, 2017 and November 1, 2017, staff members from each participating agency completed the placement and subsequent removal of gypsy moth traps throughout the state. In 2016, one gypsy moth was captured in southern Idaho. This moth was determined by the OTIS Methods Development Lab to be of the European/North American strain (EGM) and was caught in Pocatello, Bannock County in one detection trap. In response to this capture, during 2017 delimitation trapping was conducted, with 36 traps set up in a square mile grid centered around the positive Pocatello site. Delimit traps were checked once in Mid-August. In North Idaho a second year of delimitation trapping was conducted in Wardner. This delimit was surrounding the 2015 capture site of three male EGM in Wardner, Shoshone County. No moths were captured in the Wardner and Pocatello delimiting traps during 2017. Delimit trapping will occur for a second season in Pocatello during 2018.

The complete report on the 2017 Gypsy Moth Survey in Idaho may be viewed at the following IDL website:https://www.idl.idaho.gov/forestry/forestry-health/gm-report-2017.pdf
(Report provided by Stephani Penske of the IDL, Coeur d'Alene, Idaho)

Photo by: Whitney Cranshaw, Colorado State University

JAPANESE BEETLE (JB) (*Popillia japonica* (Newman))

The Japanese Beetle is a highly destructive invasive plant pest that, if established, can be very difficult and expensive to control. Feeding on grass roots, JB grubs damage lawns, golf courses, parks and pastures. JB adults attack the foliage, flowers or fruits of more than 300 different ornamental and agricultural plants. Originally from Japan, JB was first noticed in the U.S. in New Jersey in 1916. It is now known to occur in most states east of the Mississippi River while its presence in the West remains spotty. Quarantines for JB are maintained and vigorously enforced by the state governments of AZ, CA, CO, ID, MT, NV, OR, UT and WA, as well as the Canadian Provinces of British Columbia and Alberta.

JB that show up in the west have usually arrived by "hitchhiking" on airplanes, other vehicles or nursery stock moving from an infested area. When suitable conditions are encountered, JB populations have

been known to increase at a phenomenal rate. If JB were to become established in Idaho there could be large negative impacts, both economic and environmental, for the state.

Beginning in 1990, ISDA began setting out approximately 340 JB detection traps each year in high risk locations throughout Idaho. These routine surveys resulted in the capture of single specimens of JB in Ada County (1992), Gooding County (1997) and Twin Falls County (2011).

In late summer 2012, ISDA traps collected a total of 61 JB in Idaho: four near a nursery in Kootenai County, one near a nursery in Bannock County, and 56 in Boise in Ada County. Extensive delimitation trapping was conducted in 2013, with trap numbers increased to 1,553. The only catches were in Boise, however, 3,058 beetles were caught there, and most of those were in a neighborhood on the city's east side. Concurrently with the 2013 survey, 95 residential properties and 13 city parks were treated with insecticides in an attempt to eradicate JB grubs and adults where they were found in the greatest numbers. During 2014, the number of survey traps was increased again, to 2,947. So that we could more accurately determine where the JB populations were located to aid in effective control efforts. Trap data from 2014 indicated that the 2013 insecticide treatments appeared to have had a positive effect, with beetle numbers down overall by about 60% (1,283 JB were captured in the traps) – and a 95% reduction in beetles in the area where the 95 residences had been treated. Pesticide applications, under the direction of ISDA, were continued from 2014 through 2017 with a continual decline in number of JB captured each year – in 2017 only 19 beetles were trapped.

Areas chosen for treatment were based on the location of beetle captures during the previous year, and at the height of treatment (2015) the turf on 1,900 residential/commercial properties and 16 city-owned parks (approximately 550 acres) received pesticide. As JB populations decreased and areas infested began to shrink, treatment areas also were reduced, with only 400 residential/commercial properties and 3 parks requiring treatment in 2017 (totaling 27 acres). See map on page 46.

2012-2017 Summary of JB catches in Idaho

Year	*County*	*No. of Negative Traps*	*No. Positive Traps*	*No. of JB caught in county*
2012	**Ada**	**187**	**21**	**56**
	Bannock	1	1	1
	Kootenai	111	1	4
	Other Idaho Counties	228	0	0
2013	**Ada**	**74**	**688**	**3,058**
	Bannock	34	0	0
	Kootenai	167	0	0
	Other Idaho Counties	590	0	0
2014	**Ada**	**2,306**	**248**	**1,283**
	Kootenai	139	0	0
	Other Idaho Counties	254	0	0
2015	**Ada**	**2,098**	**115**	**365**
	Other Idaho Counties	342	0	00
2016	**Ada**	**1,868**	**28**	**128**
	Other Idaho Counties	340	0	0
2017	**Ada**	**1,321**	**15**	**19**
	Other Idaho Counties	257	0	0

EMERALD ASH BORER (EAB) (*Agrilus planipennis* Fairmaire)

The emerald ash borer was first identified in North America in southeastern Michigan and the Windsor, Ontario areas in 2002. Since then, it has been found in a total of 30 states, primarily in the eastern half of the U.S. and parts of Canada. Interceptions have been made as far west as Denver, Colorado. Larvae of this extremely destructive tree pest feed on tissues beneath the bark of ash trees (*Fraxinus* spp.), effectively girdling and consequently killing the trees. Adult EAB are generally active from mid-May to September.

As part of USDA's 2017 National EAB Survey, a total of 6 purple sticky traps at 6 locations in 5 counties throughout Idaho were installed and monitored. Sites included ports of entry, parks, and urban ash plantings. In 2017, the traps were baited with the Z3 hexanol lure only. As in previous years, no EAB were captured in Idaho in 2017. (*Report provided by Brian Marschman, Idaho State Plant Health Director, USDA APHIS PPQ*)

EXOTIC WOOD BORING BARK BEETLE (EWBB) (numerous species)

As part of USDA's 2017 National EWBB Survey, a total of 33 Lingren Funnel traps at 18 locations in 10 counties throughout Idaho were installed and monitored. Sites included Forest Service campgrounds, National Forests, tree farms, wood recyclers and urban landscape plantings. In 2017, a variety of 7 different lure combinations were used in the traps. Current year's specimen samples are in the process of being identified.
(*Report provided by Brian Marschman, Idaho State Plant Health Director, USDA APHIS PPQ*)

CORN COMMODITY SURVEY

Corn is a major agronomic crop in Idaho. The USDA National Agricultural Statistical Service reported 340,000 acres planted in the state in 2016. In addition to grain, Idaho corn is used for silage, processed sweet corn and sweet corn seed (Idaho ranks as the top production state for hybrid sweet corn seed varieties). Idaho sweet corn seed companies export to U.S. and international markets, making phytosanitary issues and data on freedom from exotic insects and pathogens of vital concern to the state's corn industry.

In 2017, ISDA, in cooperation with the USDA APHIS PPQ's Cooperative Agricultural Pest Survey program (CAPS), conducted surveys for four exotic organisms that could threaten Idaho corn crops. The 2017 Corn Commodity Survey is summarized in the following table:

Organism	***No. of Inspections Performed in 2017 Photo/Results***
European Corn Borer (ECB) *(Ostrinia nubilalis)* **ECB** is a major pest of corn. Originally native to Europe, it was first reported in Massachussetts in 1917. It is now well established in the eastern half of the US. Quarantines are in place to keep it from moving into the west. Larvae damage the ears of corn, as well as the stalks, by tunneling into the plant. When severe enough, ear drop may occur and/or plants may fall over. Secondary diseases may also establish after boring damage. Idaho is one of a few states not currently under quarantine restrictions on movement of commodities associated with ECB presence or	 *Adam Sisson, Iowa state University, Bugwood.org* **ALL NEGATIVE** ➢ 260 traps were placed in corn fields in the following Idaho counties: Ada, Canyon, Cassia, Elmore, Gem, Gooding, Jerome, Owyhee and Twin Falls. ➢ Traps were set out by June 15, 2017 and removed by the end of September.

damage. Surveys for this pest must be done periodically to maintain that pest-free status or to put into place a suitable control plan if the pest is detected.

Silver Y Moth (SYM)
(Autographa gamma)

SYM is another potential threat to Idaho's corn industry which, if it were to become established in the state or in other parts of the U.S., could cause significant economic losses.

SYM feeds on more than 200 different plant species, including several plants of economic importance to Idaho such as alfalfa, corn, grapes, dry beans, potato, sugar beets and wheat.

- Traps were serviced every two weeks and lures were replaced every 28 days.

Photo by: Ab H. Baas, www.ecnc.org

VISUAL SURVEYS:

Cucurbit Beetle (CB)
(Diabrotica speciosa)

CB is an insect pest of small grain, corn, potato, grape, bean and soybean crops. Native to South America, the larvae feed on roots of corn and various other crops and non-crop hosts, while the adults will feed on the leaves, stems, etc. of the host plants and move to other plants when necessary.

Photo by: Russ Ottens, University of Georgia, Bugwood.org

- 2 visual surveys were conducted in 130 corn fields throughout the following counties: Ada, Canyon, Cassia, Elmore, Gem, Gooding, Jerome, Owyhee and Twin Falls.
- First visual survey in July and then four weeks later in August.

Brown Stripe Downy Mildew (BSDM)
(Sclerophthora rayssiae var zeae)

BSDM is a fungal-like disease of corn native to India, Myanmar, Nepal, Pakistan and Thailand which, if introduced into the U.S. (it is soilborne or seedborne), could probably survive in any corn-producing areas. Downy mildews of sorghum, maize and sugarcane are among the world's most destructive diseases typically causing 20-90% grain yield reduction in affected fields.

ALL NEGATIVE

CAPS, USDA APHIS PPQ

SMALL GRAINS COMMODITY SURVEY

Wheat, which is grown in 42 of 44 Idaho counties, is a prominent crop in Idaho with its largest production areas in the eastern part of the state and the north central Palouse region. Wheat production plays an important role in Idaho's economy. After falling significantly for the past two years, wheat production in Idaho returned to normal levels in 2016, largely due to record yields. Idaho wheat yields averaged a record 91.3 bushels per acre that year, beating the previous record of 85.5 bushels set in 2004. That

resulted in Idaho farmers producing 101.9 million bushels of wheat in 2016, up from 89.4 million bushels in 2015 and 93.7 million bushels in 2014.

The success of the Idaho wheat industry depends greatly on its ability to export crops to external markets, including the Asian market where a significant amount of the soft white wheat grown in the state is exported for use in pastry and noodle making. In 2017, ISDA, in cooperation with the USDA's Cooperative Agricultural Pest Survey Program (CAPS), conducted surveys for four exotic organisms that could threaten Idaho's small grains crops. The 2017 Small Grains Commodity Survey is summarized in the following table:

Organism	***No. of inspections performed in 2017 Photo/Results***
Egyptian Cotton Leafworm (ECL) *(Spodoptera littoralis)* **ECL**, also known as the African Cotton Leafworm and the Mediterranean Brocade, is native to Africa and Israel, and widely found in both Africa and Mediterranean Europe. It has been recorded several times in the U.K. and even though it has been intercepted at U.S. ports, it is not known to be established in North America. ECL is considered a pest of national concern and may result in quarantine and/or regulatory actions if detected. It is a pest of vegetables, fruits, flowers, and other crops. The establishment of ECL in the continental U.S. would negatively impact trade.	 *Photo by: Bernard Fransen Bugwood.org* **ALL NEGATIVE** ➢ 192 traps were placed in wheat fields in the following Idaho counties: Ada, Bingham, Bonneville, Canyon, Elmore, Fremont, Gooding, Jefferson, Latah, Madison, Minidoka, Owyhee, Power and Twin Falls. ➢ Traps were set out by May 15, 2017 and removed by the end of August. ➢ Traps were serviced every two weeks ➢ ECL lures were changed every 42 days and OWB lures changed every 28 days.
Old World Bollworm (OWB) *(Helicoverpa armigera)* **OWB**, a major pest of both field and horticultural crops in many parts of the world, has still not established in the U.S., but is considered to have the potential to survive in any state in the continental U.S. based on habitat and host suitability. OWB is known to attack more than 180 plant species and can cause serious crop losses, especially in wheat. Damage occurs when the larvae bore into the host's flowers and fruit and feed within the plant. The larvae may also feed on the leaves of host plants.	 *Photo by: Gyorgy Csoka, Hungary Forest Research Institute Bugwood.org*

VISUAL SURVEYS:

Cucurbit Beetle (CB)
(Diabrotica speciosa)

CB is an insect pest of small grain, corn, potato, grape, bean and soybean crops. Native to South America, the larvae feed on roots of wheat and various other crops and non-crop hosts, while the adults will feed on the leaves, stems, etc. of the host plants and move to other plants when necessary.

Photo by: Russ Ottens,
University of Georgia
Bugwood.org

- 2 visual surveys were conducted in 96 wheat fields throughout the following counties: Ada, Bingham, Bonneville, Canyon, Elmore, Fremont, Gooding, Jefferson, Latah, Madison, Minidoka, Owyhee, Power and Twin Falls.

Wheat Bug (WB)
(Nysius huttoni)

WB is a polyphagous species which feeds on a large number of weeds and crops. It has been mainly reported as a pest of wheat and Brassicaceae, but it can feed on many plant species.

Primarily a sap feeding insect which attacks many plant parts including seeds, both adults and nymphs can cause significant injury. On wheat, damage occurs primarily when the grains are at the milk-ripe stage.

The establishment of this pest in Idaho's domestic and export wheat industries would result in increased management costs and potential crop losses.

- First visual survey in June and then four weeks later in July.

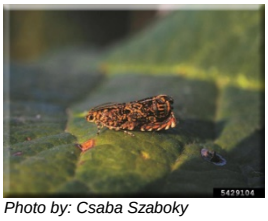
ALL NEGATIVE

Photo by: HortNET
Bugwood.org

Stone Fruit Commodity Survey

Idaho stone fruit industry is an important sector of the state's agricultural economy with approximately 2,000 acres dedicated to stone fruit production. During 2015 6,630 tons of peaches were harvested, along with 1,810 tons of cherries and 2,000 tons of plum/prunes, with a combined total value of more than $11 million. These commodities were exported to several western states, Mexico and some countries in the Pacific Rim. Each of the target organisms, if they were to be introduced and established in the area could have potential to significantly damage to the region's stone fruit industry from the crop loss and export restrictions.

In 2017, ISDA; in cooperation with the USDA APHIS, PPQ, and Farm Bill; conducted surveys for four exotic organisms that could threaten the Idaho stone fruit industry. The 2017 Stone Fruit Commodity Survey is summarized in the following table:

Organism	*No. of inspections performed in 2017 Photo/Results*
Cherry Bark Tortrix (CBT) *(Enarmonia formosana)* **CBT** is an exotic moth whose larvae primarily attack fruit and flowering trees. Native to Europe, CBT was first introduced into North America in 1989 in British Columbia, Canada. The first U.S. contact was in northwestern Washington in 1991. All woody shrubs or trees in the rose family are susceptible. CBT feeding can cause damage to trees but in many cases does not kill trees. Infestations leave the host vulnerable to secondary organisms and environmental stress.	 *Photo by: Csaba Szaboky Bugwood.org* **ALL NEGATIVE** ➢ 120 traps were placed by May 15, 2017 in 6 stone fruit production counties in Idaho: Canyon, Gem, Owyhee, Payette, Twin Falls and Washington. ➢ Traps were serviced every two weeks and lures changed every four weeks. Traps were removed by September 21, 2017.
European Cherry Fruit Fly (ECFF) *(Rhagoletis cerasi)* **ECFF** is the most serious pest of cherries in Europe. Damage associated with this pest is caused by larval feeding in the fruit pulp, which can result in losses of up to 100% if left uncontrolled. This pest may be introduced to new areas with fresh cherries or with soil or fruit from host plants grown in areas where this pest occurs. The presence of this pest in Canada was confirmed for the first time in June 2016 in an urban park located in Mississauga, Ontario. This is the first record of this fly in North America.	 *Photo by: Coutlin R. / OPIE www.inspection.gc.ca* **ALL NEGATIVE** ➢ 120 traps were placed by May 15, 2017 in 5 stone fruit production counties in Idaho: Canyon, Gem, Owyhee, Twin Falls and Washington. ➢ Traps were serviced every two weeks, at which time the ammonium acetate polycon containers were replaced. Traps were removed by August 9, 2017.

Plum Fruit Moth (PFM)
(Grapholita funebrana)

PFM is a native of Europe. This important pest of plum, peach, cherry and other stone fruit is considered to be a significant threat, because it can develop on many wild and cultivated stone fruits as well as other plants in the Rosaceae family.

If introduced into the United States, it has the potential to become established within 79 percent of the continental US. This pest currently thrives in Europe, the Middle East and northern Asia with reported crop and plant losses ranging from 25 to 100 percent.

Photo by: Donald Hobern
Global Biodiversity Information Facility (GBIF), Denmark

ALL NEGATIVE

- 120 traps were placed by May 15, 2017 in 6 stone fruit production counties in Idaho: Canyon, Gem, Owyhee, Payette, Twin Falls and Washington.
- Traps were serviced every two weeks and lures changed every four weeks. Traps were removed by September 21, 2017.

Summer Fruit Tortrix (SFT)
(Adoxophyes orana)

SFT is an insect pest native to Europe and Asia. It feeds on a wide variety of plants with preference for Rosaceous plants, especially apple and pear. This moth is reported to feed on more than 50 plant species including fruits, forest trees and ornamentals. The introduction and establishment of SFT poses serious risks in economic crop loss, costs of control measures and potential trade barriers for export of fruit.

Photo by: Jae-Cheon Sohn
Bugwood.org

Photo by: Jessica Louque, Smithers Viscient
bugwood.org

IDAHO APIARY REGISTRATION FOR 2017 AND THE NATIONAL HONEY BEE HEALTH SURVEY

ISDA registered 127 Beekeepers and 118,793 colonies in 2017.This year Idaho was one of 41 states and territories to participate in USDA APHIS's national honey bee health survey. This survey is an attempt to document which diseases, parasites, and pests of honey bees are and are not in the U.S. The survey is sponsored by APHIS in collaboration with ARS and the University of Maryland. The effort is primarily geared toward establishing the absence of exotic bee pests including, but not limited to, the parasitic mite *Tropilaelaps*, the Asian honey bee (*Apis cerana*), and Slow Bee Paralysis Virus in the U.S. To maximize the information gained from the survey effort, samples will be analyzed for other diseases and parasites known to be present in the U.S.

Honey bees contribute between $15 and $18 billion dollars annually to the value of the agricultural industry nationally due to their pollination efforts. It is imperative to have a healthy pollinator supply if we wish to continue to produce pollinator dependent fruits, nuts, and vegetables in this country. A decline in honey bee health has been documented over the past 60 years. Honey bee health is at risk from factors such as parasites, diseases, poor nutrition, stress, and environmental toxins. Over the last 8 years winter losses have been unsustainably high ranging from 22% to 36% nationally.

There is real concern that the introduction and establishment of another exotic parasite (the *Tropilaelaps* mite) would increase already high loss rates, jeopardizing pollinator dependent food production. A need exists for a continued national honey bee health survey to quickly detect exotic pest introduction in order to prevent spread. Baseline data on disease and toxin loads in honey bee populations also have utility in helping understand the causes of colony losses. Broad surveillance data over several years improves the quality of data needed to help tease apart complex drivers thought to contribute to colony collapse disorder (CCD) and poor colony health.

ISDA collected samples from 8 hives in each of the 24 apiaries surveyed throughout Idaho this summer. All 24 surveys were completed by August 16, 2017. ISDA is waiting for diagnostic reports, to be supplied by APHIS from this year's survey. A map of counties where apiary surveys were conducted can be found on page 50**.**

2017 National Honey Bee Health Survey in Idaho (Counties Sampled in Survey)

County	*Number of Samples*	*County*	*Number of Samples*
Ada	1	Idaho	1
Bannock	1	Kootenai	3
Bingham	1	Latah	1
Canyon	3	Lemhi	1
Caribou	1	Nez Perce	1
Custer	1	Payette	1
Elmore	1	Power	2
Fremont	1	Twin Falls	2
Gooding	2	**Total**	**24**

PALE CYST NEMATODE (PCN) (*Globodera pallida*)

Pale Cyst Nematode Eradication Program: Idaho

- Production Acres Surveyed: 6,049
- Seed Acres Surveyed: 2,008
- Number of Counties Surveyed: 9
- Fields Positive: 27 fields (3,043 acres total) are infested; no new fields detected in 2017.

All twenty-seven known infested fields are located within an 8.5-mile radius that spans a portion of northern Bingham County and southern Bonneville County. PPQ deregulated 1,071 acres in 2017 that successfully completed the deregulation protocol, which consists of two full-field surveys, each following a host crop. The current regulated area is 8,442 acres. Of those total acres, 3,043 acres are infested fields.

Viability staining analyses of cysts from 20 infested fields originally detected between 2006 and 2013 show no detectable viability. Of these 20, 9 fields have successfully completed the greenhouse bioassay phase of evaluating eradication progress (1 field in 2015, 6 fields in 2014, 1 field in 2012, and 1 field in 2017), making them eligible to return to potato production with certain regulatory controls in place. The remaining 11 fields have greenhouse bioassays in progress, with final results expected in 2018. There are 7 infested fields, detected between 2013-2016, working through the eradication process that still show a low level of PCN viability (average is < 3.6% viable eggs).

An infested field detected in 2006 returned to potato production in 2015 when red potatoes were planted to the west half the field (approximately 70 acres). The east half of the field was planted to red potatoes in 2016. No viable cysts were detected either year in post-harvest surveys of the potato-producing portions of the field. The grower planted red potatoes again on the west half of the field in 2017. Soil samples were collected following harvest and lab results are expected in early 2018.

The trap crop litchi tomato (LT) was planted on a 36-acre portion one infested field in 2017. Soil samples were collected at the end of the growing season to determine treatment efficacy and lab results are expected in early 2018.

The soil fumigant Telone II (1,3-dichloropropene) was applied to 665 acres (5 fields) in 2017. Soil samples were collected from four of the five fields at the end of the 2017 growing season to determine treatment efficacy and lab results are expected in early 2018. Samples will be collected from the fifth field in spring 2018 with efficacy results expected by August 2018.

In January 2018, PPQ plans to hold a 2017 PCN research review meeting in Pocatello, Idaho, which will be attended by PPQ, Idaho State Department of Agriculture, Idaho Potato Commission, representatives of the Idaho infested field owners/operators, and researchers involved with PCN research projects from the University of Idaho (Moscow, Aberdeen, and Parma), and Agricultural Research Service (Washington). Ongoing research projects include developing non-chemical PCN eradication tools such as trap crops, hatching factors, bio-fumigants, and developing a PCN-resistant russet-type potato.

Stakeholder updates (Quarterly Reports) were published to the USDA APHIS PCN website in January, April, July, and October 2017.

Sampling Information: To date, the PCN Program has collected 522,865 soil samples in Idaho to ensure Idaho's freedom from PCN outside of the 27 known infested fields. More than 151,350 samples have been collected from the eradication fields since 2006 in order to monitor eradication progress and to provide cysts to several institutions for PCN research.

To date, the PCN laboratory in Idaho Falls has screened 603,767 soil samples collected in Idaho and 68,261 samples from other potato-producing states. An additional 63,862 samples collected in Idaho were screened at the Idaho Food Quality Assurance Laboratory and the University of Idaho Parma laboratory between 2006 and 2009. There have been no pale cyst nematode detections in the U.S. outside of southeast Idaho. Since program inception, the PCN Program has analyzed the viability of 885 cyst samples collected from infested fields before and after fumigation treatments.

Since 2009, 86,141 soil samples have been collected and screened in support of the Idaho State Department of Agriculture's (ISDA) post-regulation survey of fields deregulated by the USDA.

KARNAL BUNT (KB) (*Tilletia indica*)

Karnal Bunt is a disease of wheat caused by the fungus *Tilletia indica*. *T. indica* was found in the United States in 1996. It has not been found in Idaho. The US Department of Agriculture has attempted to eradicate the fungus via continuing surveys, along with quarantines. ISDA has conducted surveys in Idaho for KB since 1996. During 2017, ISDA collected 44 wheat samples from 17 counties in Idaho and sent them to a USDA APHIS PPQ lab to be tested for the pathogen. Results from this year's survey were negative. To date, KB has never been detected in Idaho.

County	*Number of Samples*	*County*	*Number of Samples*
Ada	1	Gooding	1
Bannock	2	Idaho	5
Benewah	3	Jerome	2
Bonneville	4	Kootenai	1
Butte	1	Latah	7
Camas	1	Minidoka	4
Caribou	3	Oneida	1
Clark	1	Payette	1
Franklin	1	Twin Falls	4
Gem	1	**Total**	**44**

DISEASES AND PESTS FOUND DURING 2017 FIELD INSPECTIONS FOR EXPORT CERTIFICATION

In 2017, 60 seed companies submitted field inspection requests representing 34 crops. The total acres submitted for inspection were 32,485, with 68,040 acres actually inspected due to multiple inspections required for some crop diseases. This represents 2 less firms than participated in 2016, with a 4.48% increase in acreage from the 31,093 acres submitted in 2016.

Year	*# Participating Firms*	*# of Crops*	*Submitted Acres*	*Inspected Acres*
2004	**44**	27	**46,282**	79,671
2005	**43**	28	**42,961**	74,905
2006	**47**	30	**37,859**	70,692
2007	**48**	32	**30,938**	58,218
2008	**50**	32	**34,439**	66,114
2009	**43**	33	**36,541**	72,184
2010	**46**	35	**32,495**	62,608
2011	**41**	30	**25,193**	51,404
2012	**50**	30	**24,102**	50,045
2013	**57**	32	**23,785**	50,157
2014	**62**	36	**26,620**	55,846
2015	**62**	36	**28,678**	64,077
2016	**62**	38	**31,093**	67,930
2017	**60**	34	**32,485**	68,040

Alfalfa Seed: A total of 1,654.30 acres were submitted for inspection during the 2017 growing season. All fields inspected were found apparently free from Alfalfa mosaic alfamovirus (AMV), Bacterial leaf spot (*Xanthomonas alfalfae*), Bacterial wilt of alfalfa (*Clavibacter michiganensis subsp. insidiosus*), Dodder (*Cuscuta spp.*), Leafy spurge (*Euphorbia esula*), Stem and bulb nematode (*Ditylenchus dipsaci*), Summer blackspot (*Cercospora medicaginis*), and Verticillium wilt (*Verticillium albo-atrum and Verticillium dahliae*).

Allium (excluding Garlic): A total of 18 acres of chives, 770.33 acres of onions, 0.03 acres of ornamental allium and 216 acres of Welsh onions were submitted for inspection during the 2017 growing season. In total, there were 1,042.32 acres inspected due to multiple inspection requirements for certain diseases. All fields inspected were found apparently free from Asparagus rust (*Puccinia asparagi*), Botrytis rot of onion (*Botrytis allii*), Downy mildew of onion (*Peronospora destructor*), Onion smudge (*Colletotrichum circinans*), Onion yellow dwarf potyvirus, Purple blotch (*Alternaria porri*), Sclerotinia rot (*Sclerotinia spp.*), Smut (*Urocystis sp.*), Stem and bulb nematode (*Ditylenchus dipsaci*), and White rot of onion (*Sclerotium cepivorum*).

- Botrytis stalk rot (*Botrytis aclada*) was confirmed in 31.3 acres of onions; the remaining acres inspected were found apparently free from Botrytis stalk rot.

Beans, Azuki/Adzuki: A total of 543 acres were submitted for inspection during the 2017 growing season. In total, there were 1,048 acres inspected due to multiple inspection requirements for certain diseases. To meet requirements of IDAPA 02.06.25, Rules Governing the Planting of Beans Other Than Phaseolus Species in Idaho, all fields inspected were found apparently free from Asian soybean rust (*Phakopsora pachyrhizi*), Bean anthracnose (*Colletotrichum lindemuthianum*), Bean bacterial wilt (*Curtobacterium flaccumfaciens*), Brown spot (*Pseudomonas syringae pv. syringae*), Common blight

(*Xanthomonas axonopodis pv. phaseoli*), Fuscus blight (*Xanthomonas fuscans pv. fuscans*), and Halo blight (*Pseudomonas savastanoi pv. phaseolicola*).

Beans, Dry: A total of 836.45 acres were submitted for inspection during the 2017 growing season. In total, there were 1,949.9 acres inspected due to multiple inspection requirements for certain diseases. To meet requirements of IDAPA 02.06.06, Rules Governing the Planting of Bean Seed (Phaseolus) Species in Idaho, all fields inspected were found apparently free from Bean anthracnose (*Colletotrichum lindemuthianum*), Bean bacterial wilt (*Curtobacterium flaccumfaciens*), Common blight (*Xanthomonas axonopodis pv. phaseoli*), Fuscus blight (*Xanthomonas fuscans pv. fuscans*), and Halo blight (*Pseudomonas savastanoi pv. phaseolicola*).

- Brown spot (*Pseudomonas syringae pv. syringae*), was confirmed in 20 acres of beans, dry; the remaining acres inspected were found apparently free from Brown spot.
- Bean common mosaic potyvirus was confirmed in 4.2 acres of dry beans.

Beans, Garden: A total of 11,613.31 acres were submitted for inspection during the 2017 growing season. In total, there were 29,826.66 acres inspected due to multiple inspection requirements for certain diseases. To meet requirements of IDAPA 02.06.06, Rules Governing the Planting of Bean Seed (Phaseolus) Species in Idaho, all fields inspected were found apparently free from Bean anthracnose (*Colletotrichum lindemuthianum*), Bean bacterial wilt (*Curtobacterium flaccumfaciens*), Common blight (*Xanthomonas axonopodis pv. phaseoli*), Fuscus blight (*Xanthomonas fuscans pv. fuscans*), and Halo blight (*Pseudomonas savastanoi pv. phaseolicola*).

- Brown spot (*Pseudomonas syringae pv. syringae*), was confirmed in 140 acres of beans, garden; the remaining acres inspected were found apparently free from Brown spot.
- Bean common mosaic potyvirus was confirmed in 15 acres of beans, garden.
- Fusarium wilt (*Fusarium oxysporium*) was confirmed in 52 acres of beans, garden.

Beans, Trial Ground – *Non-Phaseolus* sp.: A total of 2.28 acres were submitted for inspection during the 2017 growing season. In total, there were 11.4 acres inspected due to multiple inspection requirements for certain diseases. To meet requirements of IDAPA 02.06.25, Rules Governing the Planting of Beans Other Than Phaseolus Species in Idaho, all fields inspected were found apparently free from Asian soybean rust (*Phakopsora pachyrhizi*), Bean anthracnose (*Colletotrichum lindemuthianum*), Bean bacterial wilt (*Curtobacterium flaccumfaciens*), Brown spot (*Pseudomonas syringae pv. syringae*), Common blight (*Xanthomonas axonopodis pv. phaseoli*), Fuscus blight (*Xanthomonas fuscans pv. fuscans*), and Halo blight (*Pseudomonas savastanoi pv. phaseolicola*).

Beans, Trial Ground – *Phaseolus sp.*: A total of 244 acres were submitted for inspection during the 2017 growing season. In total, there were 1,220 acres inspected due to multiple inspection requirements for certain diseases. To meet requirements of IDAPA 02.06.06, Rules Governing the Planting of Bean Seed (Phaseolus) Species in Idaho, all fields inspected were found apparently free from Bean anthracnose (*Colletotrichum lindemuthianum*), Bean bacterial wilt (*Curtobacterium flaccumfaciens*), Brown spot (*Pseudomonas syringae pv. syringae*), Common blight (*Xanthomonas axonopodis pv. phaseoli*), Fuscus blight (*Xanthomonas phaseoli pv. fuscans*), and Halo blight (*Pseudomonas savastanoi pv. phaseolicola*).

- Bean common mosaic potyvirus was confirmed in 1 acre of beans, trial ground – *Phaseolus sp*.

Brassicas: A total of 21.5 acres of arugula, 5 acres of choy sum, 5 acres of kale, 62 acres of mustard, 8 acres of pak choi, and 154 acres of turnip were submitted for inspection during the 2017 growing season.

All fields inspected were found apparently free from Black leg (*Leptosphaeria maculans*) and Black rot of crucifers (*Xanthomonas campestris pv. campestris*). Kale, mustard, pak choi and turnip acres were also inspected for Crucifer bacterial leaf spot (*Pseudomonas syringae pv. maculicola*). Arugula acres were also inspected for Bacterial blight crucifers (*Pseudomonas cannabina pv. alisalensis*).

Carrot: A total of 2,090.61 acres were submitted for inspection during the 2017 growing season (in total there were 2,065.61 acres inspected). All fields inspected were found apparently free from Alternaria leaf blight (*Alternaria dauci*), Bacterial blight of carrot (*Xanthomonas hortorum pv. carotae*), and Black rot of carrot (*Alternaria radicina*).

Catnip: A total of 16 acres were submitted for inspection during the 2017 growing season. All fields inspected were found apparently free from Mint root borer (*Fumibotys fumalis*), Mint stem borer (*Pseudobaris nigrina*), and Verticillium wilt of mint (*Verticillium dahliae*).

Corn: A total of 4,844.29 acres were submitted for inspection during the 2017 growing season. In total, there were 9,387.88 acres inspected due to multiple inspection requirements for certain diseases. All fields inspected were found apparently free from Brown spot (*Physoderma maydis*), Brown stripe downy mildew (*Sclerophthora rayssiae var. zeae*), Crazy top of corn (*Sclerophthora macrospora*), Eyespot (*Aureobasidium zeae*), Goss's bacterial wilt (*Clavibacter michiganensis spp. nebraskensis*), Green ear downy mildew (*Sclerospora graminicola*), Head smut (*Sporisorium reilianum),* Java downy mildew (*Peronosclerospora maydis*), Late wilt (*Harpophora maydis*), Northern corn leaf spot (*Cochliobolus carbonum*), Philippine downy mildew (*Peronosclerospora philippinensis*), Sorghum downy mildew (*Peronosclerospora sorghi*), Southern corn leaf blight (*Cochliobolus heterostrophus*), Spontaneum downy mildew (*Peronosclerospora spontanea*), Stewart's wilt (*Pantoea stewartii*), Sugarcane downy mildew (*Peronosclerospora sacchari*), and Yellow leaf blight (*Mycospharella zeae-maydis*).

- Common smut (*Ustilago maydis*) was confirmed in 287.36 acres.
- High plains virus was confirmed in 109.15 acres.

Garlic: A total of 20.8 acres were submitted for inspection during the 2017 growing season. All fields inspected were found apparently free from Asparagus rust (*Puccinia asparagi*), Botrytis rot of onion (*Botrytis allii*), Botrytis stalk rot (*Botrytis aclada*), Downy mildew of onion (*Peronospora destructor*), Onion smudge (*Colletotrichum circinans*), Onion yellow dwarf potyvirus, Purple blotch (*Alternaria porri*), Sclerotinia rot (*Sclerotinia spp.*), Smut (*Urocystis sp.*), Stem and bulb nematode (*Ditylenchus dipsaci*), and White rot of onion (*Sclerotium cepivorum*).

Grain: A total of 101.53 acres of barley, 20.75 acres of grain sorghum, 365.53 acres of oats and 607.96 acres of wheat were submitted for inspection during the 2017 growing season. In total, there were 1,583.58 acres inspected due to multiple inspection requirements for certain diseases. Barley, oat and wheat fields that were inspected were found apparently free from Bacterial leaf streak (*Xanthomonas translucens*). Grain sorghum fields were inspected and found apparently free from Sorghum downy mildew (*Peronosclerospora* sorghi).

- Ergot of cereals (*Claviceps purpurea)* was confirmed in 0.20 acres of barley.

Herbs: A total of 2 acres of oregano and 4.5 acres of thyme were submitted for inspection during the 2017 growing season. All thyme fields inspected were found apparently free from Crucifer black leaf spot (*Alternaria brassicicola*) and Pepper anthracnose (*Colletotrichum spp.*).

Lettuce/Endive: A total of 13 acres of endive and 285.74 acres of lettuce were submitted for inspection during the 2017 growing season. All fields inspected were found apparently free from Lettuce mosaic potyvirus (LMV).

Mint, Peppermint: A total of 118 acres were submitted for inspection during the 2017 growing season. In total, there were 236 acres inspected due to multiple inspection requirements for certain diseases. All fields inspected were found apparently free from Mint root borer (*Fumibotys fumalis*), Mint stem borer (*Pseudobaris nigrina*), and Verticillium wilt of mint (*Verticillium dahliae*).

Peas: A total of 5,427.6 acres were submitted for inspection during the 2017 growing season. In total, there were 13,991.10 acres inspected due to multiple inspection requirements for certain diseases.

- Bacterial blight of peas (*Pseudomonas syringae pv. pisi*) was confirmed in 21 acres; the remaining acres inspected were found apparently free from Bacterial blight of peas.
- Root and stem wilt (*Fusarium spp.*) was confirmed in 30.30 acres.

Pepper, Bell: A total of 0.01 acres were submitted for inspection during the 2017 growing season. In total, there were 0.02 acres inspected due to multiple inspection requirements for certain diseases. All fields inspected were found apparently free from Angular leaf spot (*Pseudomonas syringae pv. lachrymans*), Bacterial canker (*Clavibacter michiganensis pv. michiganensis*), Bacterial spot (*Xanthomonas* vesicatoria), Cucumber mosaic cucumovirus (CMV), Pepper anthracnose (*Colletotrichum spp*.), and Phytophthora blight (*Phytophthora capsici*).

Potato: A total of 419 acres were submitted for inspection during the 2017 growing season.

Radish: A total of 389.01 acres were submitted for inspection during the 2017 growing season. All fields were found apparently free from Bacterial blight of radish (*Xanthomonas. campestris pv. raphani*), Black rot of crucifers (*Xanthomonas campestris pv. campestris*), and Turnip/radish anthracnose (*Colletotrichum higginsianum*).

Sunflowers: A total of 1,605.2 acres were submitted for inspection during the 2017 growing season. In total, there were 2,618 acres inspected due to multiple inspection requirements for certain diseases. All fields inspected were found apparently free from Downy mildew of Asteraceae *(Plasmopara halstedii).*

ACREAGE SUBMITTED FOR INSPECTION UNDER THE IDAHO RULES FOR PHYTOSANITARY AND POST-ENTRY CERTIFICATION, RULES GOVERNING THE PLANTING OF BEANS, PHASEOLUS SPECIES, IN IDAHO AND RULES GOVERNING THE PLANTING OF BEANS, OTHER THAN PHASEOLUS SPECIES, IN IDAHO FOR THE 2017 FIELD SEASON

2017 Inspection Acres Report (compiled 01/09/2018)				
Crop	***Number of Applications***	***Acres Submitted for Inspection***	***Number of Inspections Based on Diseases Requested***	***Actual acres Inspected***
Alfalfa Total	**87**	**1,654.30**		**1,654.30**
Arugula Total	**3**	**21.50**	1.00	**21.50**
Barley Total	**77**	**101.53**	2.00	**203.06**
Beans, Azuki Total	**19**	**543.00**	2.00	**1,048.00**
Beans, Dry	51	546.45	2.00	1,092.90
	13	290.00	3.00	857.00

Beans, Dry total	**64**	**836.45**		**1,949.90**
Beans, Garden	450	4,992.27	2.00	9,963.54
	166	6,621.04	3.00	19,863.12
Beans, Garden Total	**616**	**11,613.31**		**29,826.66**
Beans Trial Ground – Non-Phaseolus Total	**2**	**2.28**	5.00	**11.40**
Beans Trial Ground – Phaseolus Total	**36**	**244.00**	5.00	**1,220.00**
Carrot Total	**390**	**2,090.61**	1.00	**2,065.61**
Catnip	**2**	**16.00**	1.00	**16.00**
Chives Total	**3**	**18.00**	1.00	**18.00**
Choy Sum Total	**1**	**5.00**	1.00	**5.00**
Corn	50	292.70	1.00	292.70
	561	4,551.59	2.00	9,095.18
Corn Total	**611**	**4,844.29**		**9,387.88**
Endive Total	**2**	**13.00**	1.00	**13.00**
Garlic Total	**41**	**20.80**	1.00	**20.80**
Grain Sorghum	**10**	**20.75**	2.00	**41.50**
Kale Total	**1**	**5.00**	1.00	**5.00**
Lettuce Total	**58**	**285.74**	1.00	**285.74**
Mustard Total	**6**	**62.00**	1.00	**62.00**
Oats Total	**16**	**365.53**	2.00	**731.06**
Onion	172	732.34	1.00	732.34
	7	37.99	2.00	75.98
Onion Total	**179**	**770.33**		**808.32**
Oregano (Herb) Total	**1**	**2.00**	1.00	**2.00**
Ornamental Allium	**1**	**0.03**	1.00	**0.00**
Pak Choi	**1**	**8.00**	1.00	**8.00**
Peas	93	1,126.60	1.00	1,126.60
	4	38.50	2.00	77.00
	242	4,262.50	3.00	12,787.50
Peas Total	**339**	**5,427.60**		**13,991.10**
Pepper, Bell Total	**1**	**0.01**	2.00	**0.02**
Peppermint Total	**8**	**118.00**	2.00	**236.00**
Potato Total	**7**	**419.00**	1.00	**419.00**
Radish Total	**25**	**389.01**	1.00	**389.01**
Sunflower	6	592.40	1.00	592.40
	17	1,012.80	2.00	2,025.60
Sunflower Total	**23**	**1,605.20**		**2,618.00**
Thyme (Herb) Total	**1**	**4.50**	1.00	**4.50**
Turnip Total	**8**	**154.00**	1.00	**154.00**
Welsh Onion Total	**14**	**216.00**	1.00	**216.00**
Wheat Total	**91**	**607.96**	1.00	**607.96**
TOTALS	**2,744**	**32,484.73**		**68,040.32**

EXPORT CERTIFICATION FOR THE 2017 CALENDAR YEAR

During 2017, the Division of Plant Industries issued 4309 Federal and 167 State Phytosanitary Certificates for 295 different types of commodities to 95 countries. The Division of Plant Industries certified over 284,513,773 pounds of seed, grain, hay, lumber, plants, and other commodities for export. The ISDA operates this program under a Memorandum of Understanding with the USDA.

PLANT PATHOLOGY SUMMARY REPORT

In 2017 the Idaho State Department of Agriculture Plant Pathology Lab (ISDAPPL) received a total of 1201 samples. Of those, 854 samples were processed with 1884 tests run on them.

From the total number of samples received, 113 samples were seed samples, representing 12 different species of plants. ISDAPPL ran 147 tests on these samples.

ISDAPPL ran tests on 574 field samples representing 16 different species. We tested 25 different fields for Wheat Streak Mosaic Virus this year with no positive finds. We also tested 188 fields for Sugarcane Mosaic Virus to meet New Zealand requirements. None of these fields were positive for this organism.

Below is a table of the samples that tested positive during the 2017 season. Of particular note were the bean seed samples and field samples, and nursery samples found positive for *Pseudomonas syringae pv syringae* (brown spot)

Type of Sample	***Crop***	***Positive Organism***	***Number samples positive***
Seed	Bean	*Pseudomonas syringae pv syringae*	1
Seed	Bean	*Bean Common Mosaic Virus*	1
Seed	Wheat	Urocystis agropyri	1
Tuber	Potato	*Clavibacter michiganesis f.sp. sepidonicus*	2
Tuber	Potato	*Potato Virus A*	2
Tuber	Potato	*Potato Virus Y*	11
Nursery	Deciduous plants	*Pseudomonas syringae pv syringae*	3
Nursery	Deciduous plants	*Diplodia sp.*	1
Nursery	Deciduous plants	*Taphrina deformans*	1
Nursery	Deciduous plants	*Botrytis cinerea*	1
Field Inspection	Barley	*Claviceps purpurea*	1
Field Inspection	Beans	*Pseudomonas syringae pv syringae*	7
Field Inspection	Beans	*Bean Common Mosaic Virus*	3
Field Inspection	Beans	*Fusarium oxysporum*	2
Field Inspection	Corn	*High Plains Virus*	10
Field Inspection	Onion	*Botrytis aclada*	2
Field Inspection	Pea	*Fusarium sp.*	3*
Field Inspection	Pea	*Pseudomonas syringae pv. pisi*	1
***Fields may have been tested multiple times for the same pathogen; but counted only once.**			

ISDAPPL also participated in a corn commodity survey for Brown Stripe Downy Mildew (*Sclerophthora rayssiae var zeae*). We received 24 survey samples. All were negative for the fungus. *S. rayssiae var zeae* is a nationally regulated pathogen which has not yet been found in the United States. This disease causes significant yield loss in the areas where it is found. For more information please see https://www.plantmanagementnetwork.org/pub/php/diagnosticguide/2007/stripe/.

SEED LAB SUMMARY

The Idaho State Seed laboratory (ISSL) received 4663 samples and completed 7087 service tests in fiscal year 2016/17. The most common crops submitted for service testing during this timeframe were alfalfa, grains, corn, onion, beans, peas, mixtures, turnip, lettuce, carrot, timothy, teff, sagebrush, and other native species. In all, 71 regulatory enforcements were checked for licensing and truth-in-labeling requirements; 8 of these checks resulted in inspector actions. A total of 667 seed dealer licenses were issued.

An influx of sagebrush testing was created again this year because of the recent devastating range fires across the intermountain west. Reseeding projects with native seed has increased these testing requests. The lab continues to be very busy with agricultural crops as well. As many as 250 distinct species were tested.

CULL ONION INSPECTIONS AND ACTIONS

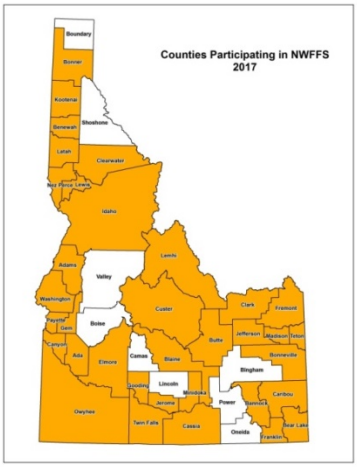
In 2017, Idaho experienced severe and prolonged winter weather conditions. Heavy snow loads collapsed a number of onion sheds in southwestern Idaho. The wet spring conditions and significant flooding resulted in the need to dispose of a significant amount of onions.

Due to the damage to onion sheds and the excessive amount of cull onions, Idaho State Department of Agriculture Communications Director Chanel Tewalt sent out notice that extended the deadline of March 15th to April 15th. "We are working in concert with industry to balance the need for disposal with their ability to dispose of culls due to weather conditions," Tewalt said.

These conditions had ISDA investigators monitoring and following up with approximately eleven locations of growers and processors to ensure they were properly disposing of their culls onions. Most of these locations were directly connected to the large amount of cull onions needing to be disposed of due to the collapse of onion storage sheds in Payette and Washington counties. These locations required direct communications with representatives from the department including cautionary letters sent to a few locations.

OTHER REGULATORY INSPECTIONS AND ACTIONS

ISDA, under the authority of Title 22, Chapters, 4, 5, 23 and 24 of the Idaho Code, and IDAPA defined pest quarantines, conducted 3,936 inspections and consequently took action against various pest threats and other violations. In 2017, there were 1,860 licensed nurseries in the state; of those, 525 were inspected for compliance under statutes of the Idaho Nursery and Florists Law and were examined for the presence of plant pests and noxious weeds. In addition, specific checks were made for compliance with other state laws, quarantines and pests of particular concern. The results of these inspections and regulatory actions are listed below.



Noxious Weed Free Forage and Straw (NWFFS)

In 1996, the United States Forest Service (USFS) began requiring all forage and straw possessed on their lands in Idaho to be certified as noxious weed free (NWF) to prevent the introduction and spread of noxious weeds. In March of 2011, the Bureau of Land Management (BLM) implemented the same rule in Idaho. ISDA administers this program to facilitate compliance for equine users and re-vegetation managers.

In 2017, ISDA trained seventy (70) people (the majority were NWFFS Inspectors) at seven (7) sites; Private landowners and agency partners were also invited to this event.

ISDA continues to partner with the Idaho Department of Fish and Game by supplying NWFFS information for their Big Game Hunting Regulations.

In 2017, 33,920 acres of forage and straw was inspected and certified NWF by trained County cooperators for a farm value of nearly $6.6 million. NWF products such as hay and straw bales, forage cubes, pellets, twice-compressed forage and straw bales make NWF products increasingly more accessible and available to equine recreationalists and land rehabilitators. Education continues to be a focus of the NWFFS program. ISDA distributes a NWFFS brochure geared to equine users to all interested groups. ISDA has an in-depth NWFFS website; please Google “ISDA Weed Free Hay”. The NWFFS program plays an important role in protecting Idaho’s wild places from noxious weed introduction. Above is a map of participating NWFFS counties.

ISDA continues to be a partner with the Idaho Hay and Forage Association (IHFA). ISDA has attended (and presented many times) their annual conference for the last thirteen (13) years. In addition, the ISDA NWFFS Program Manager has participated on its board, as an ex-officio member for thirteen (13) years.

ISDA continues to be a partner with the College of Western Idaho Horticulture Program. ISDA presented its Invasive Species message to students this fall and has presented many times over the last thirteen (13) years.

ISDA NOXIOUS WEEDS AND INVASIVE SPECIES PROGRAMS

Invasive species present a significant threat to the economy and environment of Idaho. The Idaho State Department of Agriculture (ISDA) administers the Invasive Species Program for the state, managing program activities that include watercraft inspection, invasive species surveys, invasive species education, and management of the state’s Noxious Weed program.

Program highlights

- Over 93,000 watercraft inspections were conducted in 2017.
- Over 493,000 watercraft inspections have been conducted in Idaho since the program began in 2009.
- 31 zebra/quagga mussel fouled vessels were intercepted in 2017.
- 195 zebra/quagga mussel fouled vessels have been intercepted in Idaho since the program began in 2009.
- Increased level of watercraft inspection station operations on numerous levels including:
    - Operation of two new inspection stations located at Hwy 3 “Rose Lake” and I-15 South at Dubois,
    - Extend the hours of operation to “all daylight hours” at all inspection stations throughout the state,
    - 24-hour operation at the I-84 West Cotterell Watercraft Inspection Station,
    - New cooperative agreement with the Bear Lake Regional Commission to support two Utah Watercraft Inspection Stations,
    - Addition of new law enforcement agreements for assistance statewide,
    - The operation of three roving inspection crews throughout the state, an increase from two inspection crews in 2016.
- 905 veliger samples for zebra/quagga mussel early detection monitoring were collected from over 80 waterbodies throughout the state in 2017.
- To date, no evidence of zebra or quagga mussels has been found in the waters of Idaho.
- To date, zebra/quagga mussels have not been observed anywhere in the waters of the Columbia River Basin, including Oregon, Washington, Wyoming, British Columbia and Alberta.
- Over 180 acres of Eurasian watermilfoil were treated in 2016.
- The hydrilla eradication project has seen over a 95% reduction in plants in the last 4 years.
- The Noxious Weeds Cost Share program distributed $1,266,237 to CWMA programs statewide.
- ISDA’s Noxious Weeds Cost Share Program had participation from 29 CWMAs, who treated over 167,000 acres of weed infestations throughout Idaho.
- Over 28,339 acres were certified under the Noxious Weed-Free Forage and Straw program.
- Iberian thistle and purple starthistle were added to the Noxious Weed list during the 2016 legislative session.

Watercraft Inspection

Prevention of aquatic invasive species (AIS) is a significant component of the program. The 2017 season was the ninth year of the watercraft inspection program, with 18 inspection stations operated statewide (Figure 1). In 2017, stations inspected 93,083 watercraft, a record number of watercraft originating from all across North America (Figure 2). The increase in inspection numbers was due, in part, to several factors including, extending station operation to cover daylight hours, 24-hour operation at I-84 West Cotterell, operating two additional inspection stations and contracting with law enforcement to assist with station compliance (Figure 3).

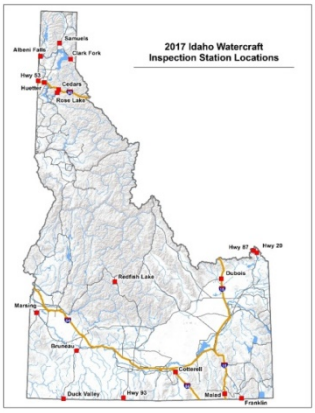


Figure 1: 2017 Watercraft Inspection Station Locations

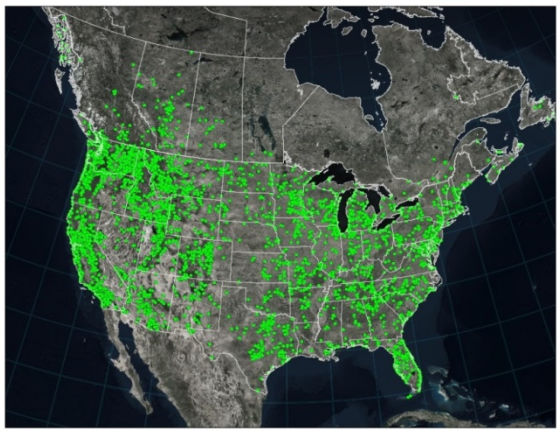


Figure 2: 2017 Watercraft Inspection Zip Codes

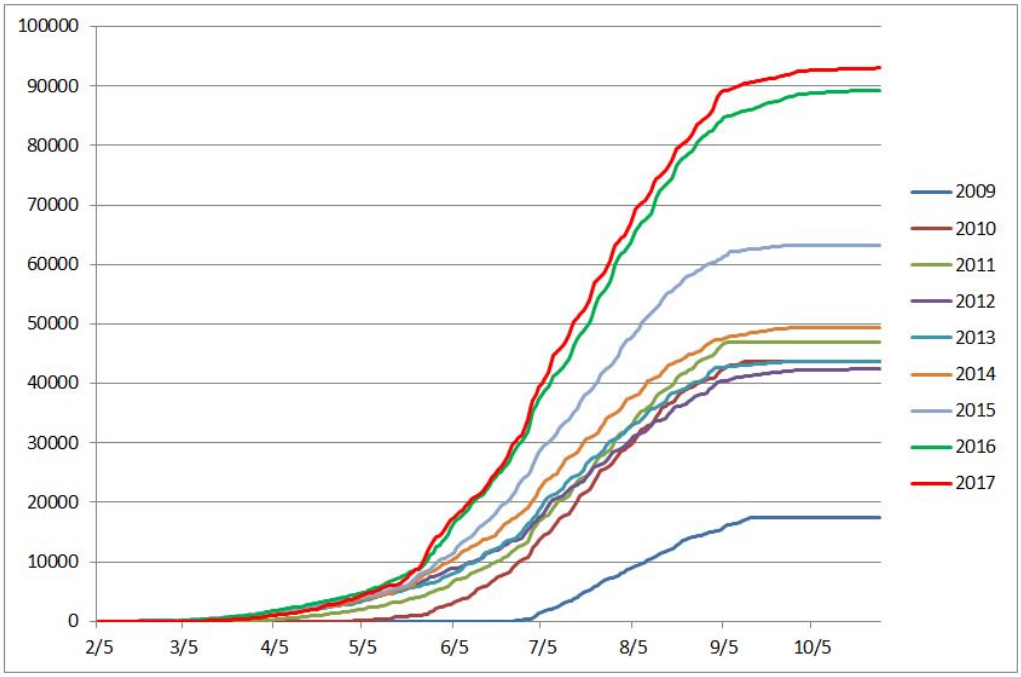


Figure 3: Total Watercraft Inspection Performed over Time

High Risk Inspections: 1,577 high-risk watercraft visited waters with zebra/quagga mussel infestations within the previous 30 days. Watercraft traveling from these areas represent the highest risk for transporting live zebra/quagga mussels into the state. Watercraft inspection at mussel-impacted waters is the most efficient and effective way to prevent the introduction of mussels into Idaho. In the Southwest, Utah and Nevada watercraft inspectors regularly inspect boats leaving the mussel-infested waters of Lakes Powell and Mead. However, watercraft leaving the mussel-impacted waters of Lake Havasu and Lake Pleasant are not usually inspected until they reach Idaho.

Vessels that were found to have recently been in mussel-impacted waters received a thorough high-risk inspection and hot wash to ensure that they were free of AIS. Following inspection, over half of these boats traveled to destinations in Idaho, with the remainder destined to locations throughout the western region.

Watercraft inspection information is available online at: http://invasivespecies.idaho.gov/maps/.

Mussel-Fouled Watercraft: 31 watercraft were intercepted transporting zebra or quagga mussels in 2017. These vessels originated from mussel-impacted waters in the Southwest, as well as from waters in Michigan, Wisconsin, and Texas (Appendix 2). Seven of these vessels were destined for Idaho, with the others heading to waters in the neighboring states. Vessels that were destined for Idaho were thoroughly decontaminated by ISDA staff and remained out of the water for a minimum of 30 days. A total of 195 mussel-fouled vessels have been intercepted in Idaho since the program began in 2009 (Figure 4-6).

Additional watercraft inspection data from the 2017 season is displayed on the ISDA Invasive Species Program website at: http://invasivespecies.idaho.gov/watercraft-inspection-stations/.

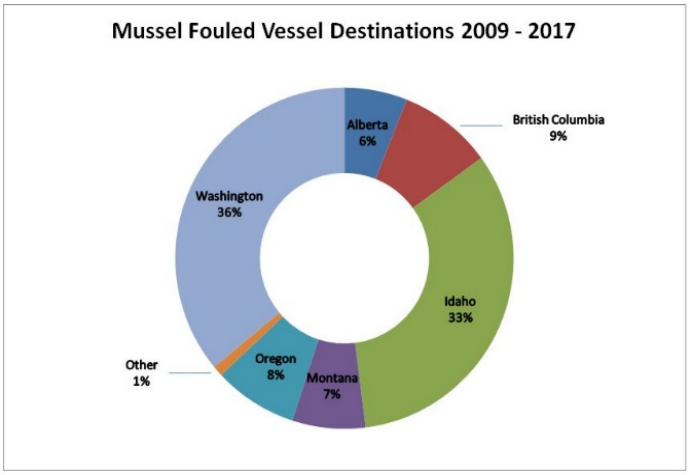


Figure4: Mussel Fouled Vessel Destination: 2009-2017

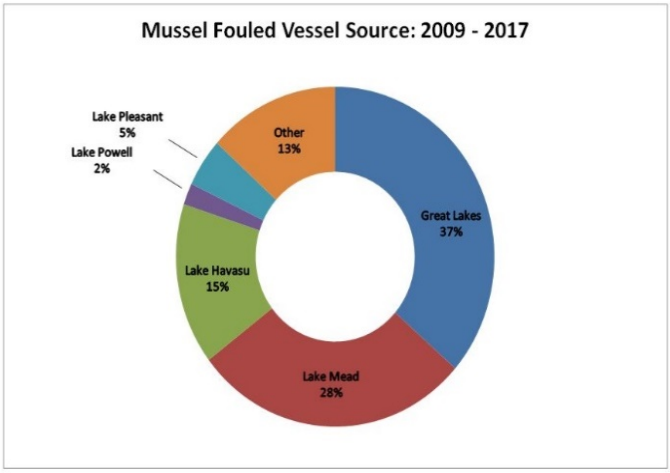


Figure 5: Mussel Fouled Vessel Source: 2009-2017

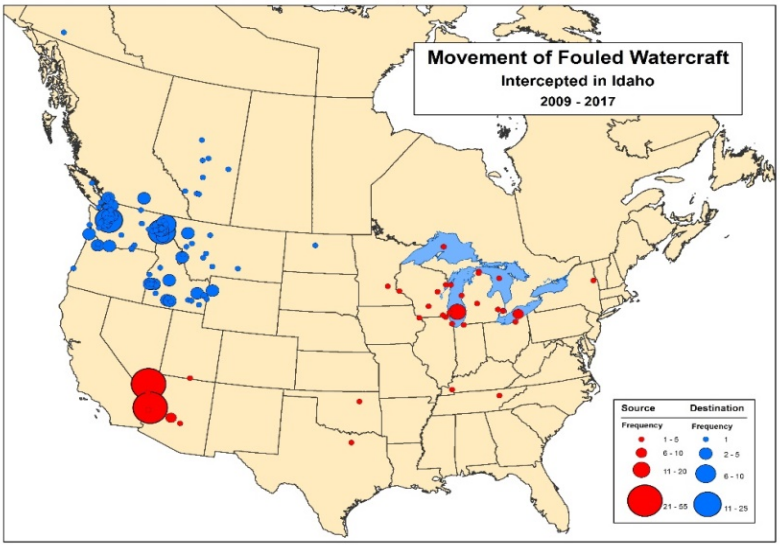


Figure 6: Movement of Fouled Watercraft 2009-2017

Appendix 1: Idaho Watercraft Inspection Numbers by station in 2017

Inspection Station	Total Inspections by Station	Previously in Fouled Water	Weeds	Commercial	Hot Wash	Refused Hotwash	Previously Inspected
Bruneau	2,661	9	1	2	6	0	21
Marsing	1,849	19	3	5	8	2	62
Redfish Lake	1,729	19	1	0	7	0	40
Huetter	13,926	26	76	106	21	2	106
Hwy 53	5,646	3	22	2	2	1	4
Albeni Falls	8,585	6	11	1	2	1	6
Samuels	6,780	8	56	8	32	1	93
Clark Fork	5,734	14	54	2	15	1	270
Dubois	917	23	2	4	0	0	598
Rose Lake	3,316	11	19	2	6	0	249

HWY 93	1,835	269	4	15	228	31	129
Cotterell	2,815	308	10	315	250	44	399
Malad	4,327	484	19	6	291	86	234
Franklin	4,177	52	24	0	26	2	25
Hwy 87	6,431	47	18	10	2,105	0	985
Hwy 20	6,144	80	126	7	2,386	5	1,557
Cedars	10,779	199	60	506	111	18	1,952
Hwy 51 Duck Valley	63						
	87,714	**1,577**	**506**	**991**	**5,496**	**194**	**6,730**
Roving Crew 1	1,333	8	4	0	0	0	15
Roving Crew 2	1,071	3	8	0	0	0	47
Roving Crew 3	819	5	0	0	1	0	1
Henrys Lake	2,146	13	7	0	0	0	834
	5,369	**29**	**19**	**0**	**1**	**0**	**897**
	93,083	**1,606**	**525**	**991**	**5,497**	**194**	**7,627**

Appendix 2: Summary of Mussel Fouled Vessels Intercepted in 2017

Date	Origin	Destination State	Vessel Type	Out of Water less than 30 days?	Vessel Recently Purchased	Commercial	ISDA Notified Prior to Interception
2/15/2017	Lake Havasu, AZ	ID	Pontoon 22'	Y	Y	N	AZGFD
2/22/2017	Lake Havasu, AZ	ID	Fishing Boat 19.5'	Y	N	N	AZGFD
3/20/2017	Lake Havasu, AZ	AB	Ski Boat 18.5'	Y	N	N	
3/26/2017	Lake Havasu, AZ	ID	Fishing boat	Y	N	N	
4/1/2017	Lake Havasu, AZ	MT	Pontoon 18'	Y	N	N	
4/6/2017	Lake Havasu, AZ	MT	Inflatable raft	Y	N	N	
4/16/2017	Lake Havasu, AZ	MT	Fishing Boat 15'	Y	N	N	AZGFD
4/16/2017	Lake Havasu, AZ	AB	Pontoon 24'		N	N	
5/1/2017	Lake Michigan, MI	WA	Cabin Cruiser 26'	N		N	
5/23/2017	Ohio	WA	Cabin Cruiser	N	Y	N	
5/25/2017	Lake Erie	OR	Cabin Cruiser	Y			
6/8/2017	Lake Havasu, AZ	WA	Pontoon Boat	Y	N	N	AZGFD
6/17/2017	Mohave, AZ	OR	Pontoon Boat	Y	N	N	
6/18/2017	Great Lake, MN	WA	Tug Boat	Y	Y	Y	
6/24/2017	Keystone Lake, OK	WA	Cabin Cruiser	Y	Y	Y	
6/24/2017	Lake Michigan, IL	BC	Commercial		Y	Y	

			Work				
6/27/2017	Fox Lake, IL	OR	Pontoon Boat	N	N	N	
7/8/2017	Great Lake, MN	ID	Fishing Boat 14'	Y	N	N	
7/9/2017	Lake Superior, MN	WA	Fishing Boat 28'	N	Y	Y	
7/9/2017	Ohio	BC	Cabin Cruiser 28'		Y	Y	MT
7/25/2017	New York	WA	Cabin Cruiser 22'			Y	MT
7/31/2017	Canyon Lake, AZ	ID	Pontoon 22'	Y	Y	N	MT
8/1/2017	Lewisville Lake, TX	ID	Pleasure Boat	N	N	N	
8/2/2017		OR	Sail boat	N	N	Y	
8/9/2017	Lake Michigan, MI	WA	Fishing Boat	N		Y	MT

Invasive Species Early Detection Monitoring

ISDA's early detection monitoring program collected 905 plankton samples from 80 waterbodies in Idaho in 2017 (Figure 7). A number of partners also assist with mussel early detection monitoring including the Idaho Department of Environmental Quality (DEQ), The Shoshone Piute Tribe, The Coeur d'Alene Tribe, Idaho Power Company, US Army Corps of Engineers, US Forest Service, lake associations, and various canal companies and irrigation districts throughout the state. To date, no evidence of mussels has been found in Idaho or anywhere in the Columbia River Basin.

Education

Education is a major component of the ISDA invasive species prevention program. Watercraft inspection stations play an important role in education through one-on-one interaction with the public and reinforcing the "Clean, Drain, Dry" message. Inspectors also provided a variety of invasive species-related educational materials to the public.

ISDA staff participated in a number of events this season which helped educate user groups and the boating public on invasive species issues and the importance of "Clean, Drain, Dry." Events included the Saint Maries Jet Boat Races, the Twin Falls County Fair, the Idaho State Fair, the Idaho Horticultural Show, the Boise River Bash, the BREN River Boogie, 2017 Science Olympiad Tournament, and the American Falls Bowfishing Tournament. Staff provided 13 watercraft inspection trainings, educating over 100 individuals on the threats of invasive species and watercraft inspection protocols. Staff also presented on invasive species issues to noxious weed professionals, counties, tribes, master naturalists, angling groups, marine deputies, ITD Port of Entry staff, DEQ staff, IDFG staff, lake associations, and student groups.

ISDA also unveiled a new Invasive Species of Idaho website with the help of the marketing expertise of Drake Cooper. Two additional campaign messages were created, "Knock it Off" and "Know What You Grow," to add to established messages already in use, "Clean-Drain-Dry", "Don't Let It Loose", and "Buy It Where You Burn it." An Invasive Species of Idaho Facebook page was also created and is being utilized to promote important campaign messages, form collaborative relationships, share ideas and articles, and drive internet traffic to the website for more detailed information. Other platforms utilized to drive traffic to the website included: radio spots, banner ads, and Pandora radio commercials. The Invasive Species of Idaho website had over 39,000 visits in 2017 and over 85,000 page views.

Idaho Invasive Species Council

The Idaho Invasive Species Council (IISC) was created by Executive Order in 2001 as a forum for coordinating invasive species related efforts and initiatives in the state.

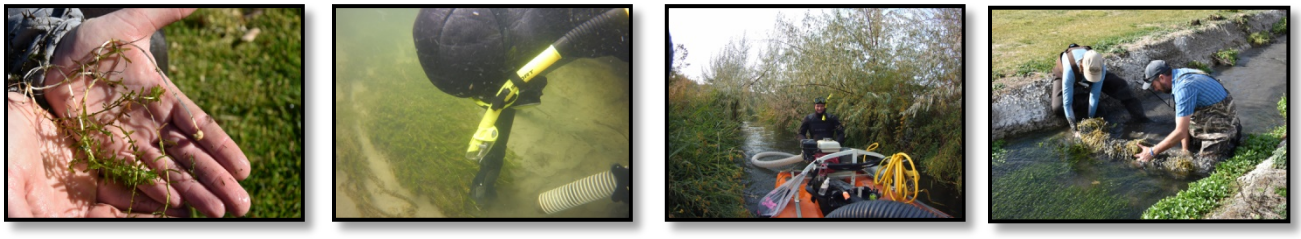
Executive Order 2017-05 replaces Executive Order 2010-14, to continue this coordinated effort. The IISC holds biannual meetings to discuss and projects. In 2017, the IISC evaluated and contributed to updating the Idaho Invasive Species Strategic Plan. An updated copy of the IISC Strategic Plan is available online at: http://invasivespecies.idaho.gov/invsp-programrp

Other Programs

Eurasian watermilfoil: Eurasian watermilfoil (EWM) is one of the most problematic invasive aquatic plants in North America. EWM out-competes native vegetation and degrades aquatic habitats by reducing biodiversity. EWM forms dense canopies of growth throughout the water column which can make boating and fishing impossible, as well as degrade property values. In 2016, 181 acres of EWM were treated with herbicide in Hayden, Cocolalla, and Priest Lakes. ISDA also supported IDFG for EWM herbicide treatments in fishing ponds in southwestern Idaho. Low density EWM areas were treated by diver removal in Priest, Hayden, Coeur d'Alene, and Payette Lakes. To date, no EWM has been found in Eastern Idaho.

Eurasian x native milfoil hybrids have presented some treatment challenges in recent years. ISDA, working in cooperation with Montana State University and the Coeur d'Alene Tribe, investigated milfoil hybrids in Idaho. Milfoil hybrids were identified in four Idaho waterbodies and each waterbody was found to have a different hybrid genotype. This information will be used to improve milfoil management during the 2017 season.

Hydrilla: Hydrilla is considered the worst submersed aquatic plant in North America. It is an EDRR noxious weed in Idaho and an eradication program has been ongoing in the Bruneau and Boise area since 2008. Hydrilla densities have decreased significantly over the course of the program, and no downstream spread of hydrilla has been observed. Plant surveys in 2017 found a decrease of overall hydrilla occurrence of 99% in the Bruneau River population with only 27 plants found, and no plants have been found in the Boise population for two consecutive years.



Several new populations of hydrilla were identified in the Twin Falls and Buhl area in 2015. These populations are associated with geothermally-influenced aquaculture facilities and these areas are currently undergoing monthly treatments. Survey and eradication efforts began in 2016 and by 2017, significant decreases are already being observed. Management approaches mirrored recent efforts in the Bruneau area and included manual, mechanical and biological controls. To date, no hydrilla has been found outside of the thermal water areas, including downstream in the Snake River.

Flowering Rush: Flowering rush is a submersed/emergent noxious weed that is expanding in Idaho. It forms dense growth and causes significant problems for boating and irrigation systems. ISDA has been involved with several flowering rush treatment projects, while attempting to identify effective treatment methods. In cooperation with County noxious weed staff, US Army Corps of Engineers, and USDA Agriculture Research Service, ISDA was involved with flowering rush treatment and evaluation projects in Lake Pend Oreille, and in ponds in Eastern Idaho in 2016. Effective treatment methods are currently being developed and refined to provide effective tools for flowering rush management.

CWMA Cost Share Program

ISDA has continued to provide leadership, training, and support to Cooperative Weed Management Areas (CWMAs) throughout the state. These CWMAs are comprised of county governments, federal partners, Native American Tribes, and private landowners. CWMAs work cooperatively to combat noxious weed infestations across agency and jurisdictional boundaries. Their efforts help to protect wildland habitat, ecosystem diversity, recreational opportunities, and agriculture in Idaho.

In 2017, ISDA awarded over $1.1 million dollars in cost share grants to 29 participating CWMAs. The CWMA cost share participants provided over $4 million dollars in matching contributions, and treated over 180,000 acres of noxious weed infestations. These treatments include chemical, mechanical, cultural, and biological control methods. Cost share revenues also contributed to the mapping and monitoring of over 1.2 Million Acres of previously uncharted lands. CWMA's also started to incorporate revegetation work to try and help Idaho lands to recover from the invasion of noxious weeds, CWMA's re-habilitated over 1,600 acres in 2017. The CWMAs also helped to educate citizens about the threat of noxious weeds, and they reached over 699,000 people in 2017.

Photo by Joseph Berger, bugwood.org

ISDA AND USDA COOPERATIVE RANGELAND GRASSHOPPER AND MORMON CRICKETSUPPRESSION PROGRAM

Grasshoppers and Mormon crickets continue to be one of the most serious pest problems for Idaho rangelands and adjacent croplands. Based on annual surveys conducted by the United States Department of Agriculture (USDA) and Animal Plant Health Inspection Service (APHIS), Idaho has experienced very serious pest outbreaks in previous years. The management and the timely control of grasshopper and Mormon cricket populations are high priorities for the Idaho State Department of Agriculture (ISDA) and our cooperators at USDA and APHIS. Congress has addressed this issue with special funding to the impacted states of Idaho, Utah, and Nevada.

With this funding, ISDA has made pesticides available to landowners to control these pests. To qualify to receive these pesticides, a landowner must file a "Request for Evaluation of Need for Suppression of Grasshoppers or Mormon Crickets in Idaho" commonly known as the "Complaint Form", with ISDA, and ISDA will evaluate their land to determine if the site has reached economic damage.

Background

Sixty-four percent of Idaho lands are administered by the Federal Government. Forty-three percent (21.8 million acres) of Idaho is classified for use as rangeland. The Bureau of Land Management (BLM) administers 11.8 million acres in Idaho, much of it prime grasshopper/Mormon cricket habitat. There is a significant area of grasshopper and Mormon cricket habitat on federal lands that border private rangelands and irrigated croplands in the state. Mormon crickets and grasshoppers (primarily about six species) are cyclical economic pest problems, particularly in Southwestern Idaho. In recent years, significant outbreaks have also occurred in Northern, North-Central, and SouthCentral Idaho.

The grasshopper and Mormon cricket program is divided into four (4) regions: Northern (N), Southwestern (SW), South-Central (SC), and Eastern (E), with offices in Coeur d' Alene (N), Boise (SW), Twin Falls (SC), and Idaho Falls (E). The area formerly known as Eastern Idaho is now designated as SC and E Idaho. ISDA awarded the bait contracted for fiscal years 2017 and 2018 to Simplot Partners, and Drexel 5% Carbaryl bait was provided at a cost of $0.819 per pound.

ISDA continued to use electronic devices (tablets & computers) to record complaints and evaluate properties. The electronic "Complaint form" was again posted on the ISDA Grasshopper/Mormon cricket website and many landowners, especially people who use smart phones, were able to use this form. The use of the tablets has improved efficiency by allowing data to be entered into the system once and providing a way to track complaints and response. In addition, Geographic Information System (GIS) points are available to identify known Threatened and Endangered Species locations that could impact treatment options.

Carbaryl 5% bait (referred as "bait" hereafter) was the only insecticide distributed to landowners, and applied by ISDA ground treatment staff. The bait was stored at six different storage sites around the state. When bait was not the most effective insecticide for grasshopper control, ISDA reimbursed landowners for insecticide and adjuvant costs on a case-by-case basis.

University of Idaho Extension offices in Elmore, Franklin, Idaho, Nez Perce, and Latah counties continued to be strong partners in the program; fielding complaints using the new electronic forms and forwarding them to ISDA. County Weed Control offices in Elmore, Franklin, Gem, and Kootenai County agreed to store and distribute bait to approved landowners. ISDA seasonal temporary Pest Detection Specialists (PDS) were located across the state to respond to complaints and survey known infestation locations. ISDA continues to use personal survival beacons (SPOT) for all employees working in this program.

APHIS and ISDA offices in Boise and Twin Falls continued to work together by sharing scouting information.

Summary of Grasshopper Actions Statewide

Statewide, there were 138 landowner complaints, and 69,630 lbs of bait was distributed to landowners in 19 counties; this was slightly less than what was distributed in 2016 (76,090 lbs).

In addition, ISDA reimbursed five landowners for insecticides. ISDA scouted 446 sites (ISDA surveys for both grasshoppers and Mormon crickets at the same time) statewide. No county or state road Rights-Of–Way were treated by the ISDA for grasshopper infestations. ISDA continues to work with the United States Fish and Wildlife (USFW) Service and Idaho Fish and Game (IDFG) to avoid treatment near endangered species.

In Southwestern and South Central Idaho, the three most common grasshoppers are: Clear-winged Grasshopper *(Camnula pellucida*), Two-striped Grasshopper (*Melanoplus bivittatus*) and Migratory Grasshopper (*Melanoplus sanguinipes*).

The map on page 38 shows the geographic location of surveying and evaluations (grasshopper & Mormon cricket complaints combined).

Summary of Grasshopper Actions by Region

Northern Idaho: Northern Idaho received more precipitation than normal during the winter and spring (especially February and March) and it was colder than normal. The first day above 50 °F (temperature at which grasshopper development begins) was on 3-28-17. The first grasshopper complaint was received on 6-19-17. There were 38 complaints in six counties and 30 met the ISDA requirements and wished to receive assistance in the form of carbaryl bait. Total bait distribution in Northern Idaho was 7,040 lbs; this was slightly more than what was distributed in 2016 (5,920 lbs). The majority of the complaints (19) in Northern Idaho were received late in the summer in Idaho County. The majority of those complaints were concentrated in the South Fork of the Clearwater River drainage. In the last five years, ISDA had received very few complaints in this county.

Northern Idaho Private Landowner Grasshopper Complaints and Bait Distribution

County	Number of Complaints	Number of Landowners that received bait	Carbaryl Bait Distributed (lbs)
Bonner	1	1	880
Boundary	4	3	800
Clearwater	4	2	160
Idaho	19	14	4,480
Kootenai	9	9	640
Nez Perce	1	1	80
Totals	38	30	**7,040**

Southwestern Idaho: South West Idaho received more precipitation than normal during the winter and spring and it was much colder than normal in January, however, normal the rest of the winter and spring months. The first day above 50 °F was on 2-6-17. Scouting began in Gem County in late-March. The first grasshopper complaint was received on 6-5-16 in the Mesa area, Adams County. There were 71 complaints in seven counties and 64 met the ISDA requirements and wished to receive assistance in the form of carbaryl bait. Total bait distribution in South Western Idaho was 49,110 lbs; which was significantly more than what was distributed in 2016 (40,080 lbs). Washington County and Elmore County were the most active areas in Southwestern Idaho. In addition, there were three landowner reimbursements in Southwestern Idaho, with applications totaling 1,456 acres.

Southwestern Idaho Private Landowner Grasshopper Complaints and Bait Distribution

County	Number of Complaints	Number of Landowners that received bait	Carbaryl Bait Distributed (lbs)
Ada	4	4	1,370
Adams	20	20	5,600
Boise	8	7	4,960

Elmore	12	9	9,960
Gem	14	12	6,560
Owyhee	10	9	8,460
Washington	3	3	12,200
Totals	**71**	**64**	**49,110**

South Central Idaho: South Central Idaho received more precipitation than normal during the winter and spring. It was colder than normal in January and then warmer than normal February and March. The first day above 50 °F was on 2-9-17. Scouting began the first week of May, and the first complaint was received in Hammett in Elmore County on 6-9-17. There were 27 complaints in seven counties and 15 met the ISDA requirements and wished to receive assistance in the form of carbaryl bait. Total bait distribution in South Central Idaho was 13,280 lbs; this was a significant decrease from 2016 (29,690 lbs bait); however, there were two landowner reimbursements in the Hollister area, totaling 576 acres. The farming areas of Hollister, Richfield, Rogerson, and Twin Falls had numerous complaints. Farmers that qualified received and applied bait on the unplanted pivot corners to protect their irrigated crops.

The state range-land in the Cotterell area which is located adjacent to the junction of Highway 84 and Highway 86 in Cassia County that was treated with Dimilin 2L in 2016 (6,626 acres) was surveyed bi-weekly in 2017. The grasshopper population in this area stayed well below the economic threshold.

South Central Idaho Private Landowner Grasshopper Complaints and Bait Distribution

County	Number of Complaints	Number of Landowners that received bait	Carbaryl Bait Distributed (lbs)
Cassia	1	1	800
Elmore	2	1	2,000
Gooding	4	1	2,000
Jerome	1	0	0
Lincoln	7	5	1,800
Power	2	2	680
Twin Falls	10	5	6,000
Totals	**27**	**15**	**13,280**

Eastern Idaho: Eastern Idaho received more precipitation than normal during the winter and spring. It was colder than normal in January and then normal the rest of the winter and spring. Scouting began in mid-May, and the first complaint was received in Swan Lake in Bannock County on 7-31-17. There were only 2 complaints this region and only one landowner met the ISDA requirements and wished to receive assistance in the form of carbaryl bait. Total bait distribution in Eastern Idaho was 200 lbs; this was a decrease from 2016 (400 lbs bait).

Eastern Idaho Private Landowner Grasshopper Complaints and Bait Distribution

County	Number of Complaints	Number of Landowners that received bait	Carbaryl Bait Distributed (lbs)
Bannock	1	1	200

Oneida	1	0	0
Totals	**2**	**1**	**200**

In summary, the cost of insecticides to assist landowners decreased in 2017 ($66,654.17) from 2016 ($83,238.21). The amount of bait used in 2017 (76,090 lbs) was slightly more than what was distributed in 2016 (69,630 lbs), however, the decrease in costs was a result of not having to aerially treat the Cotterell state land in 2017 ($15,240). Landowner reimbursement costs in 2017 (9,627.20) was slightly more than in 2016 ($6,797.72).

Pesticides Distributed/Reimbursed Statewide for Grasshopper Control

	Lbs ($.819 lb)	**Value**
Carbaryl 5% Bait, Ground	69,630	$57,026.97
Landowner Reimbursement Program (this program reimbursed only the insecticide & adjuvant costs) Ground & Aerial Application		$9,627.20
Total		**$66,654.17**

Heavy Infestation of Mormon Crickets on Hwy 20 near Tollgate Photo by Dan Safford

Summary of Mormon Cricket Actions Statewide

Southwestern Idaho was the only region in the state that received Mormon cricket complaints. Southwestern Idaho received more precipitation than normal during the winter and spring and it was much colder than normal in January, however, normal the rest of the winter and spring months.

In Southwestern Idaho, the first day over 41°F (temperature at which Mormon cricket development begins) was 1-5-17. Scouting began in Owyhee County on 3-25-17. The first complaint was received on 5-3-17 in Cambridge.

In Southwestern Idaho, there were 78 landowner complaints and 63 landowners met the ISDA requirements and wished to receive assistance in the form of carbaryl bait. Total bait distribution in Southwestern Idaho in 2017 was 76,430 lbs; this was a huge increase from 2016 (12,770 lbs). Owyhee and Washington County were the most active. In Owyhee County the outbreaks were concentrated in the Reynolds Creek drainage and the Givens Hot Springs area, nearly 17,000 lbs was distributed. In Washington County the outbreaks were concentrated north of Weiser, (where three large ranches hired an aerial applicator to apply bait 14,600 lbs), Midvale, and Cambridge; nearly 47,000 lbs were distributed in this county.

ISDA ground treated the Right-Of-Way on the following State Highways:
5-10-17, Highway 71, 20 miles (480 lbs), west of Cambridge
6-7-17, Highway 95, 18 miles, (800 lbs), near Idaho/Oregon state line
6-14-17, Highway 20, 16 miles, (920 lbs), east of Mountain Home
7-25-17, Highway 20, 16.7 miles, (560 lbs), east of Mountain Home (same exact area as the 6-14-17 application)

To treat these highways, ISDA worked with the Idaho Transportation Department (ITD) to secure permits and ITD lent roadside signs and on one occasion provided a shadow vehicle during treatment.

In summary, the cost of insecticides to assist increased in 2017 ($64,856.61) from 2016 ($11,261). This increase is a result of the large outbreak in 2017.

Southwestern Idaho Private Landowner Mormon Cricket Complaints and Bait Distribution

County	Number of Complaints	Number of Landowners that received bait	Carbaryl Bait Distributed (lbs)
Ada	3	2	400
Boise	1	1	4,000
Elmore	9	7	2,350
Gem	7	6	6,040
Owyhee	28	23	16,680
Washington	30	24	46,960
Totals	**78**	**63**	**76,430**

Pesticides Distributed Statewide for Mormon Cricket Control

	Lbs ($.819 lb)	Value
Private Landowners	76,430	$62,596. 17
State Land and Right-of way Treatment	2,760	$2,260. 44
Total	**79,190**	**$64,856. 61**

Summary of ISDA Grasshopper and Mormon Cricket Program

In 2017, ISDA continued to suppress outbreaks of grasshoppers and Mormon crickets. There were 216 complaints and 173 private landowners in 19 counties that received assistance in the form of bait. A breakdown of the pesticides distributed and/or reimbursed are in the table below.

A landowner reimbursement program was again implemented for qualified landowners and five landowners (2,032 acres) participated in three counties.

ISDA applied Carbaryl bait on the Right-Of-Way on three state highways (Hwy 20, Hwy 71, Hwy 95) in 2017. In summary, the total cost of insecticides and application to assist increased dramatically in 2017 ($131,510.78) from 2016 ($94,499.46).

For additional information, go to the ISDA website www.agri.idaho.gov and search under the Plants and Insects tab for the Grasshopper/Mormon Cricket Program.

All Pesticides Distributed/Reimbursed Statewide to Control Grasshoppers and Mormon Crickets

	Lbs ($.819 lb)	Value
Carbaryl 5% Bait, Ground, Private Landowners, to control grasshoppers	69,630	$57,026.97
Carbaryl 5% Bait, Ground, Private Landowners, to control Mormon crickets	76,430	$62,596.17
Total Private	**146,060**	**$119,623.14**
Carbaryl 5% Bait, Applied to State Lands & Right of Way to control grasshoppers	0	$0.00

Carbaryl 5% Bait, Applied to State Lands & Right of Ways to control Mormon crickets	2760	$2,260.44
Total Lbs Carbaryl 5% Bait Distributed	**148,820**	**$121,883.58**
Landowner Reimbursement Program (this program reimbursed only the insecticide & adjuvant costs) Ground & Aerial Application	NA	$9,627.20
Total Cost of all Bait and Liquid Insecticide		**$131,510.78**

Multi-Year Summary of Carbaryl Treatments on State and County Road Right-of-Ways and State Lands

Year	Total Pounds Applied	Acres Treated
2005	12,175	1,218
2006	6,612	661
2007	3,906	340
2008	3,750	194
2009	21,200	1,446
2010	4,300	428
2011	900	92
2012	2,650	267
2013	0	0
2014	0	0
2015	3,550	355
2016	980	98
2017	2760	276

2017 Landowner Reimbursement with Private Landowners for Grasshopper Suppression

Acres Treated	Insecticides	Total Project Cost	Cost Per Acre
2,032	Chlorpyriphos Cyflurin Cobalt Advance Dimethoate 400 Lambda Cy Ag Mustang Max	$9,627.20	$4.74

2017 Number of Complaints and Bait Distributions to Private Landowners for Grasshopper and Mormon Cricket Suppression

Rank	County	Number of Complaints	Number of Landowners that received bait	Carbaryl Bait Distributed (lbs)
1	Washington	33	27	59,160
2	Owyhee	38	32	25,140
3	Gem	21	18	12,600
4	Elmore	23	17	14,310

5	Boise	9	8	8,960
6	Twin Falls	10	5	6,000
7	Adams	20	20	5,600
8	Idaho	19	14	4,480
9	Gooding	4	1	2,000
10	Lincoln	7	5	1,800
11	Ada	7	6	1,770
12	Bonner	1	1	880
13-Tied	Boundary	4	3	800
14-Tied	Cassia	1	1	800
15	Power	2	2	680
16	Kootenai	9	9	640
17	Bannock	1	1	200
18	Clearwater	4	2	160
19	Nez Perce	1	1	80
20-Tied	Jerome	1	0	0
21-Tied	Oneida	1	0	0
Totals		**216**	**173**	**146,060**

2017 Grasshopper and Mormon Cricket Forecast

Northern Idaho: The below table is a 14-year history of Carbaryl 5% bait usage on private lands (grasshopper and Mormon cricket combined). The table shows a peak distribution in 2009, then in 2015 and then decreasing amounts since that year. Historical data indicates that a larger economic outbreak might occur at some point.

Northern Idaho

Year	Number of Counties	Lbs. Distributed
2004	0	0
2005	2	103,750
2006	2	16,400
2007	2	7,900
2008	4	104,300
2009	8	180,750
2010	6	52,500
2011	5	23,500

2012	5	11,600
2013	5	5,350
2014	6	4,250
2015	6	18,120
2016	4	5,920
2017	6	7,040
Avg.	4	38,670

Southwestern Idaho: The below table is a 14-year history of Carbaryl 5% bait usage on private lands (grasshopper and Mormon cricket combined). The dramatic usage increase in 2017 was due to the huge outbreak of Mormon crickets. Historical data indicates that a larger economic outbreak might occur at some point.

Southwestern Idaho

Year	Number of Counties	Lbs. Distributed
2004	5	264,650
2005	6	48,950
2006	6	69,850
2007	7	150,440
2008	7	93,850
2009	7	205,350
2010	8	212,650
2011	9	68,100
2012	7	20,950
2013	2	58,400
2014	5	24,750
2015	8	73,560
2016	8	52,850
2017	7	125,540
Avg.	7	103,412

South Central Idaho: This region was created in 2015. Previous to that year, the area we have now designated as South Central and Eastern Idaho was designated as Eastern Idaho (24 counties). In 2017, there was a large decrease in bait usage; however, there were two landowner reimbursements.

South Central Idaho

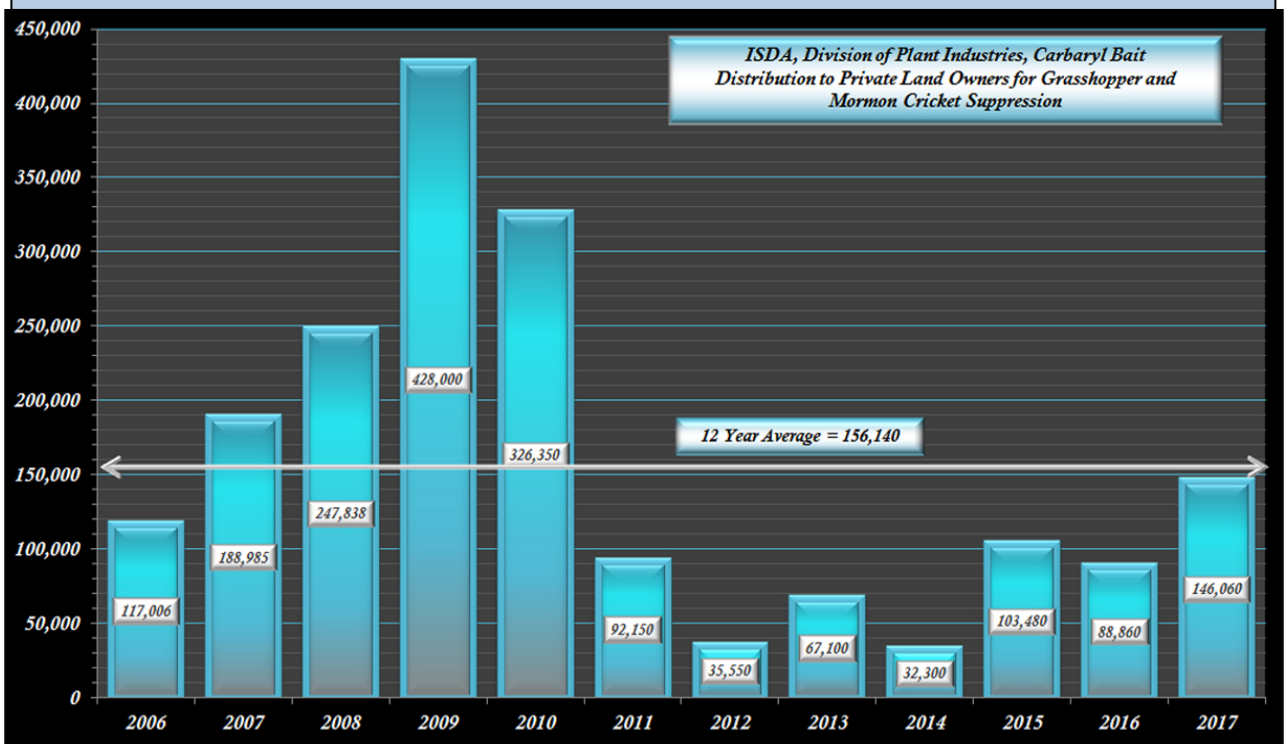
Year	Number of Counties	Lbs. Distributed
2015	2	6,750
2016	6	29,690
2017	7	13,280
Avg.	5	18,220

Eastern Idaho: The below table is a 14-year history of Carbaryl 5% bait usage on private lands (grasshopper and Mormon cricket combined). Prior to 2015, this region included 24 counties and now the region is 10 counties. Historical data indicates that a larger economic outbreak might occur at some point.

Eastern Idaho

Year	Number of Counties	Lbs. Distributed
2004	6	89,250
2005	2	34,700
2006	3	29,000
2007	3	26,500
2008	7	45,450
2009	5	39,200
2010	10	60,500
2011	2	550
2012	3	3,000
2013	4	3,650
2014	6	3,300
2015	2	5,050
2016	1	400
2017	1	200
Avg.	4	24,339

ISDA, Division of Plant Industries, Carbaryl Bait Distribution to Private Land Owners for Grasshopper and Mormon Cricket Suppression



Major Cooperators for the Grasshopper/Mormon Cricket Program

During the 2017 season, the following cooperators provided significant help in receiving complaints, bait storage, distribution, and overall program delivery:

- Elmore County Pest Abatement
- Franklin County Weed Control
- Gem County Weed Control
- Idaho Transportation Department, Boise (and field offices in Council, Marsing, and Mountain Home)
- Kootenai County Weed Control
- Simplot Partners, Caldwell, Idaho
- S&P Enterprises, Twin Falls Storage Unit
- University of Idaho, Extension Service, Franklin County, Idaho
- University of Idaho, Extension Service, Idaho County, Idaho
- University of Idaho, Extension Service, Latah County, Idaho
- University of Idaho, Extension Service, Nez Perce County, Idaho

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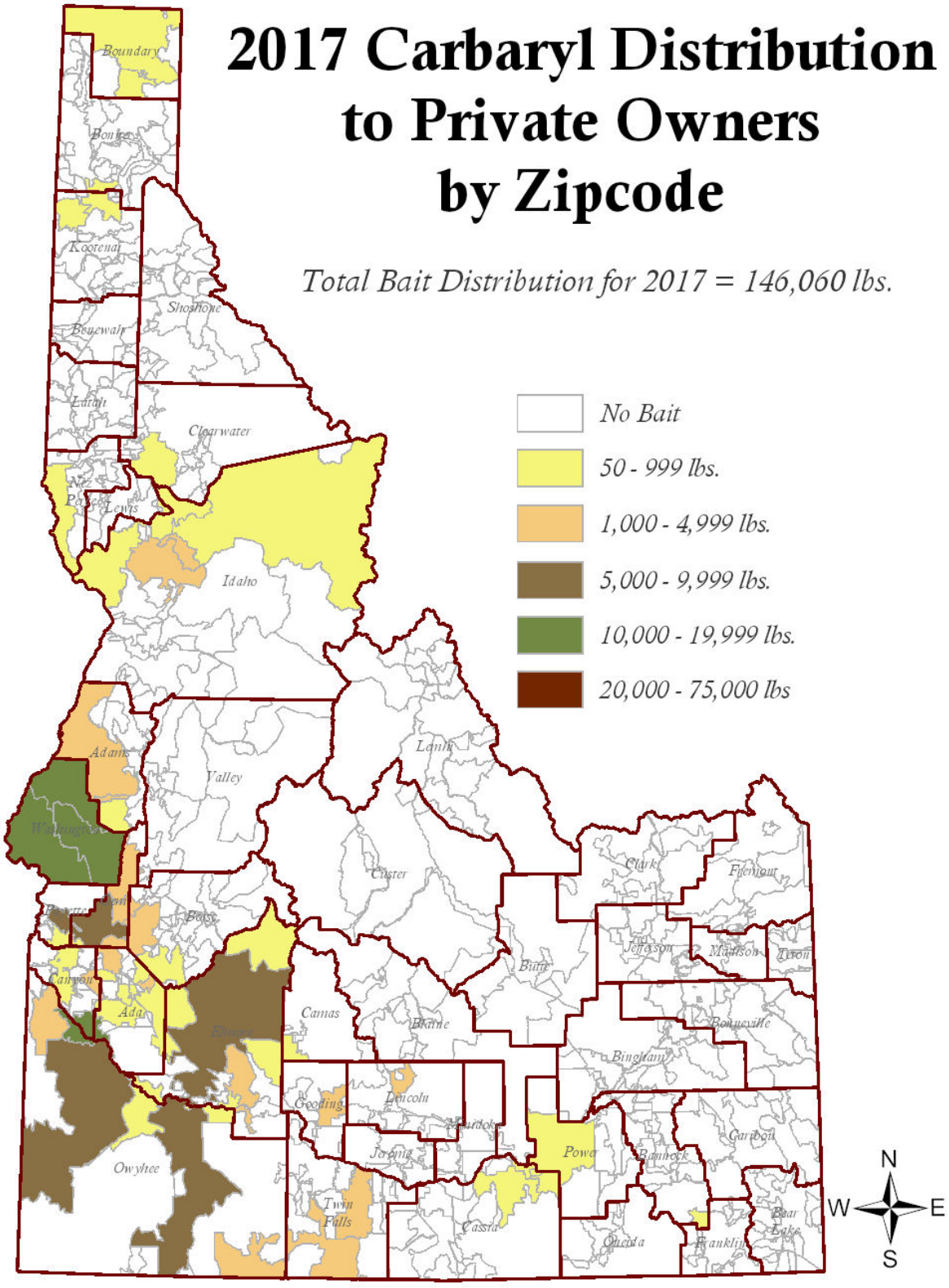
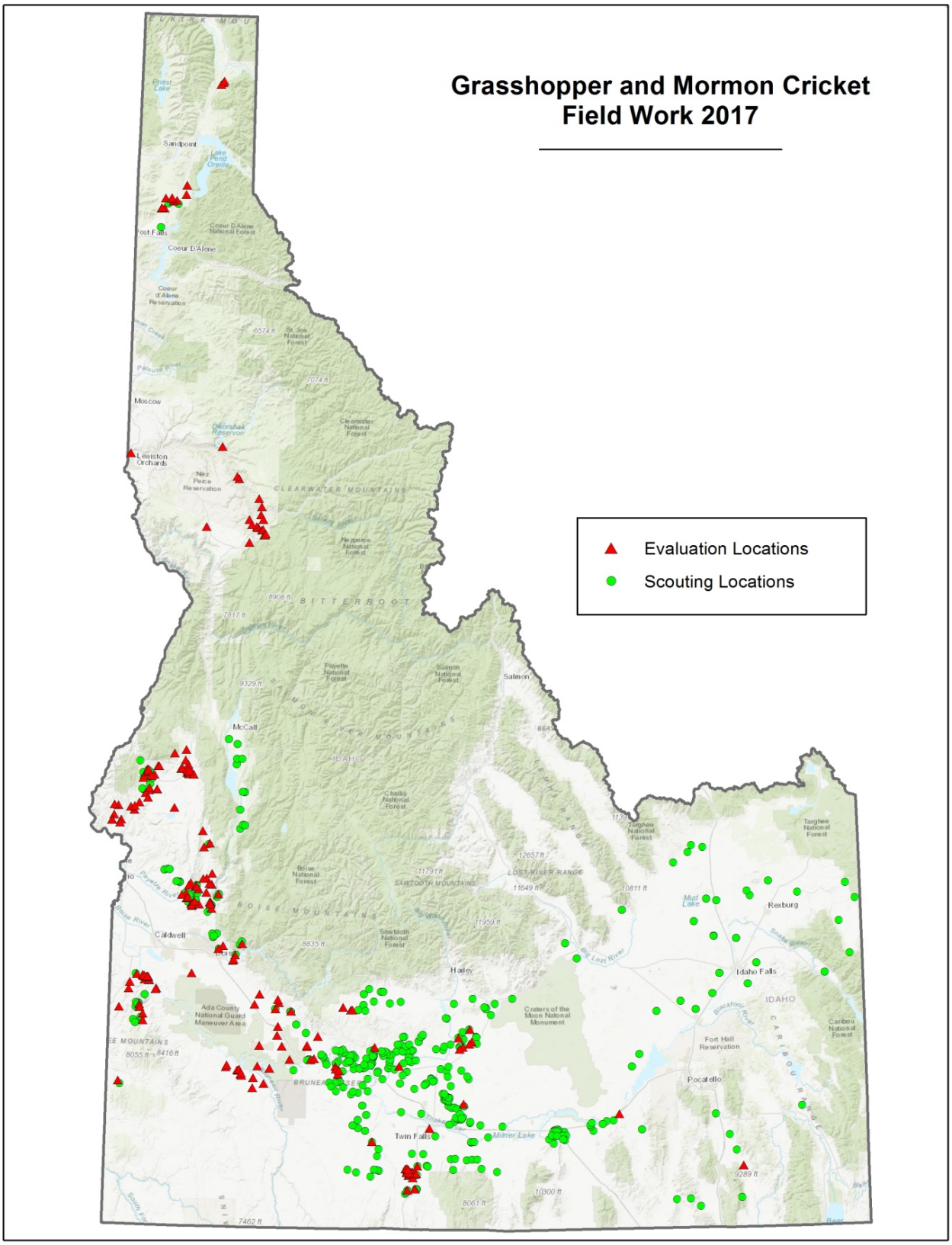

2017 Carbaryl Distribution to Private Owners by Zipcode
Total Bait Distribution for 2017 = 146,060 lbs.
No Bait
50 - 999 lbs.
1,000 - 4,999 lbs.
5,000 - 9,999 lbs.
10,000 - 19,999 lbs.
20,000 - 75,000 lbs
Boundary
Bonner
Kootenai
Shoshone
Benewah
Latah
Clearwater
Nez Perce
Lewis
Idaho
Adams
Valley
Custer
Lemhi
Clark
Fremont
Jefferson
Madison
Teton
Butte
Camas
Blaine
Bonneville
Bingham
Lincoln
Gooding
Jerome
Power
Caribou
Bannock
Owyhee
Twin Falls
Cassia
Oneida
Franklin
Bear Lake
N
W
E
S


Grasshopper and Mormon Cricket
Field Work 2017
Evaluation Locations
Scouting Locations
Sandpoint
Coeur D'Alene
Moscow
Lewiston
Salmon
McCall
Caldwell
Hailey
Twin Falls
Pocatello
Idaho Falls
Rexburg
IDAHO

2017 PUBLIC OUTREACH AND EDUCATONAL PRESENTATIONS ON INVASIVE SPECIES, PEST SURVEY AND DETECTION, AND GRASSHOPPER MANAGEMENT PROGRAMS

Presentations given in 2017 by ISDA Staff

Date	ISDA Staff	Event	Target Audience
January 18	Dan Safford	Idaho Noxious Weed Conference	Weed Professionals
January 19	Bethany Muffley	Idaho Noxious Weed Conference	Weed Professionals
January 19	Dan Safford	Idaho Noxious Weed Conference	Weed Professionals
January 19	Paul Castrovillo	Idaho Horticulture Expo: Questions about ISDA Invasive Species Programs	Public
February 3	Dan Safford	Idaho Hay and Forage Association Annual Conference	Farmers
February 4	Dan Safford	Idaho Hay and Forage Association Annual Conference	Farmers
February 23	Paul Castrovillo	College of Western Idaho: sharing the World with Bugs/ISDA's War on Invasive Insect Pest	Insect and Disease Horticulture Class
March 16	Paul Castrovillo	ISDA's 2017 Invasive Insect Pest Surveys	ISDA Field Investigators and Staff
March 20	Paul Castrovillo	Sharing the World with Bugs/ISDA's War on Invasive Insect Pests	Deer Flat National Wildlife Refuge Mater Naturalists
March 21	Bethany Muffley	Timberline High School	Students
March 21	Paul Castrovillo	Treasure Valley Beekeepers Club: Do Honey Bees Need a Vet?	Hobbyist Beekeepers
March 23	Bethany Muffley	Science Olympiad group from Sacred Heart School	Students
March 24	Paul Castrovillo	Sharing the World with Bugs/ISDA's War on Invasive Insect Pests	McCall Master Naturalists
April 4	Paul Castrovillo	Sharing the World with Bugs/ISDA's War on Invasive Insect Pests	Boise Master Naturalists
April 8	Bethany Muffley	Science Olympiad Competition - Nampa	Students
April 21	Paul Castrovillo	Idaho Center for Outdoor Education: Insects in the Ecosystem and the Effects of Invasive Pests	Grade School/High School Students, Parents, Teachers
April 25	Paul Castrovillo	East End Neighborhood Association: Status of JB and Eradication Program in East End	Public
June 28	Paul Castrovillo	Ag Inspector ENT101	ISDA Field Investigators
July 26	Paul Castrovillo	ID Botanical Garden Bug Camp: Keeping Invasive Insect Pests Out of Your Neighborhood	Grade School Students
August 19	Paul Castrovillo	ID Botanical Garden Bug Day: Ask an Entomologist	Bug Day attendees (public)
August 23	Nic Zurfluh	Hayden Lake Watershed Association Meeting	Homeowners

August 24	Nic Zurfluh	Cocolalla Lake Association Board of Directors Meeting	Homeowners
August 25	Nic Zurfluh	Lakes Commission Quarterly Meeting	General Public
September 19	Bethany Muffley/ Michael Johnson	BREN River Boogie	General Public
September 19	Paul Castrovillo	Sage International School: Sharing Our World With Bugs - But Not the Invasive Pests	Grade School/High School Students in Jr. Master Naturalist Club
September 22	Kim Holzer	Cocolalla Lake Association Board of Directors Meeting	Homeowners
September 27	Kim Holzer	Selkirk CWMA Meeting	Weed Professionals
October 11	Kim Holzer/ Nicole Haddad	Washington State Lake Protection Association Meeting	Weed Professionals
October 12	Nic Zurfluh/ Kim Holzer	"Capital For A Day"	General Public
October 16	Kim Holzer	Inland Empire CWMA Meeting	Weed Professionals
November 1	Paul Castrovillo	2017 Invasive Insect Pest Surveys Conducted by Idaho State Department of Agriculture and an Update on Japanese Beetle Eradication in Boise	ID Association of Plant Protection Mtg attendees
November 4	Dan Safford	College of Western Idaho Horticulture Class	Students
November 8	Dan Safford	ISDA Fall Invasive Species Staff Meeting	Idaho Invasive Species Council
November 8	Paul Castrovillo	2017 Invasive Insect Pest Surveys Conducted by Idaho State Department of Agriculture and an Update on Japanese Beetle Eradication in Boise	Idaho Invasive Species Council
November 9	Dan Safford	Idaho Invasive Species Council	Idaho Invasive Species Council
November 22	Kim Holzer	Palouse CWMA Meeting	Weed Professionals
November 28	Kim Holzer	"Bay Watchers" Training	General Public
November 28	Paul Castrovillo	ISDA's War on Invasive Insects/Japanese Beetle Eradication Efforts in Boise	SW Idaho Weed Control Association meeting attendees
December 5	Bethany Muffley	Gem County Pesticide Re-certification Seminar	Landowners
December 6	Bethany Muffley	Elmore County Pesticide Re-certification Seminar	Landowners
December 7	Bethany Muffley	Owyhee County Pesticide Re-certification Seminar	Landowners

December 7	Kim Holzer	Clearwater Basin CWMA Meeting	Weed Professionals
December 19	Kim Holzer	Pend Oreille AIS Workgroup	
December 20	Bethany Muffley	Payette County Pesticide Re-certification Seminar	Landowners
December 20	Dan Safford	Payette County Noxious Weed Seminar	Landowners

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ISDA Website: www.agri.idaho.gov This report, as well as past years' summary reports, are available at the ISDA Website:

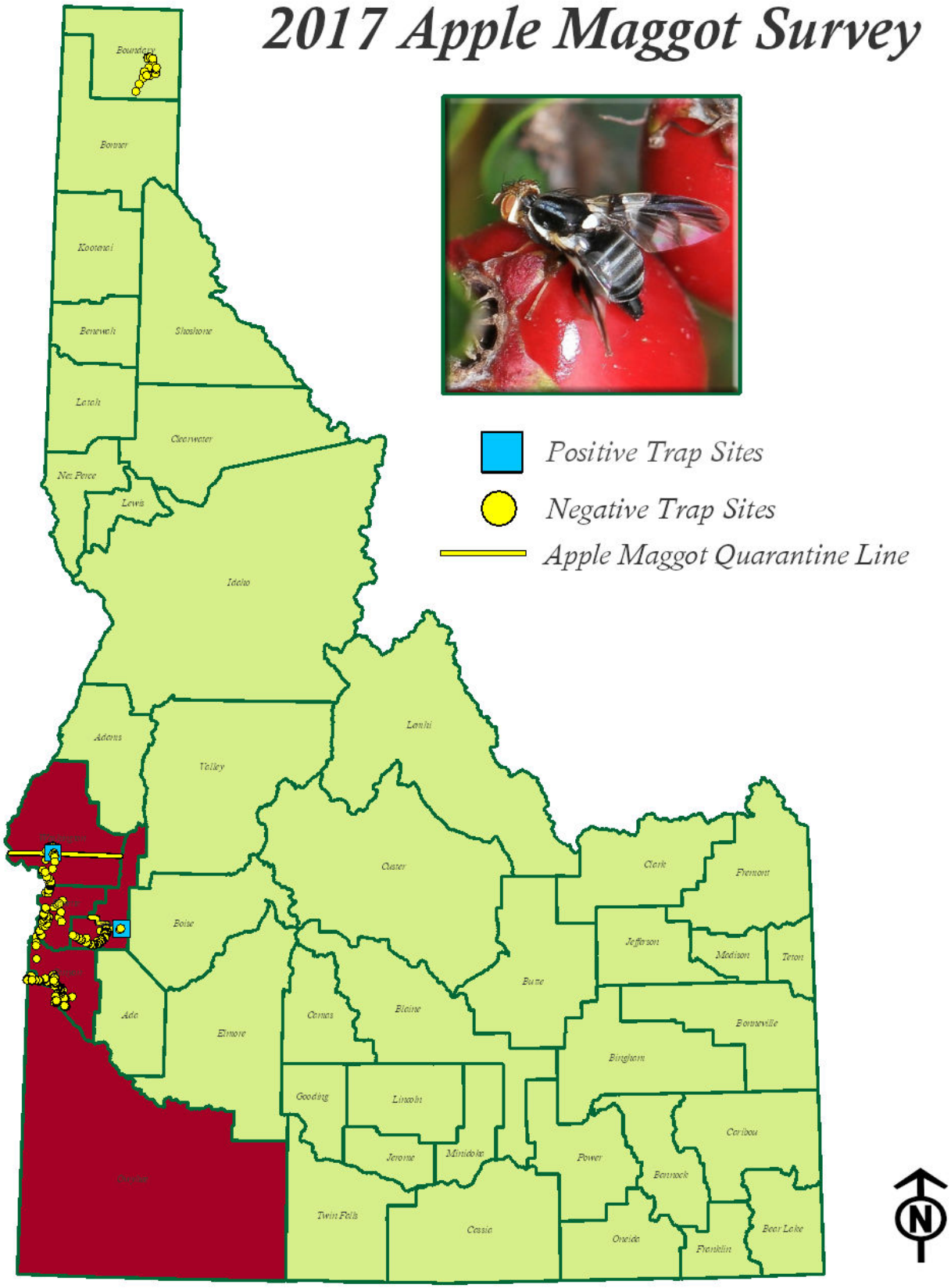
http://www.agri.idaho.gov/AGRI/Categories/PlantsInsects/RegulatedAndInvasiveInsects/Insectsformreports.php

2017 Apple Maggot Survey

Positive Trap Sites

Negative Trap Sites

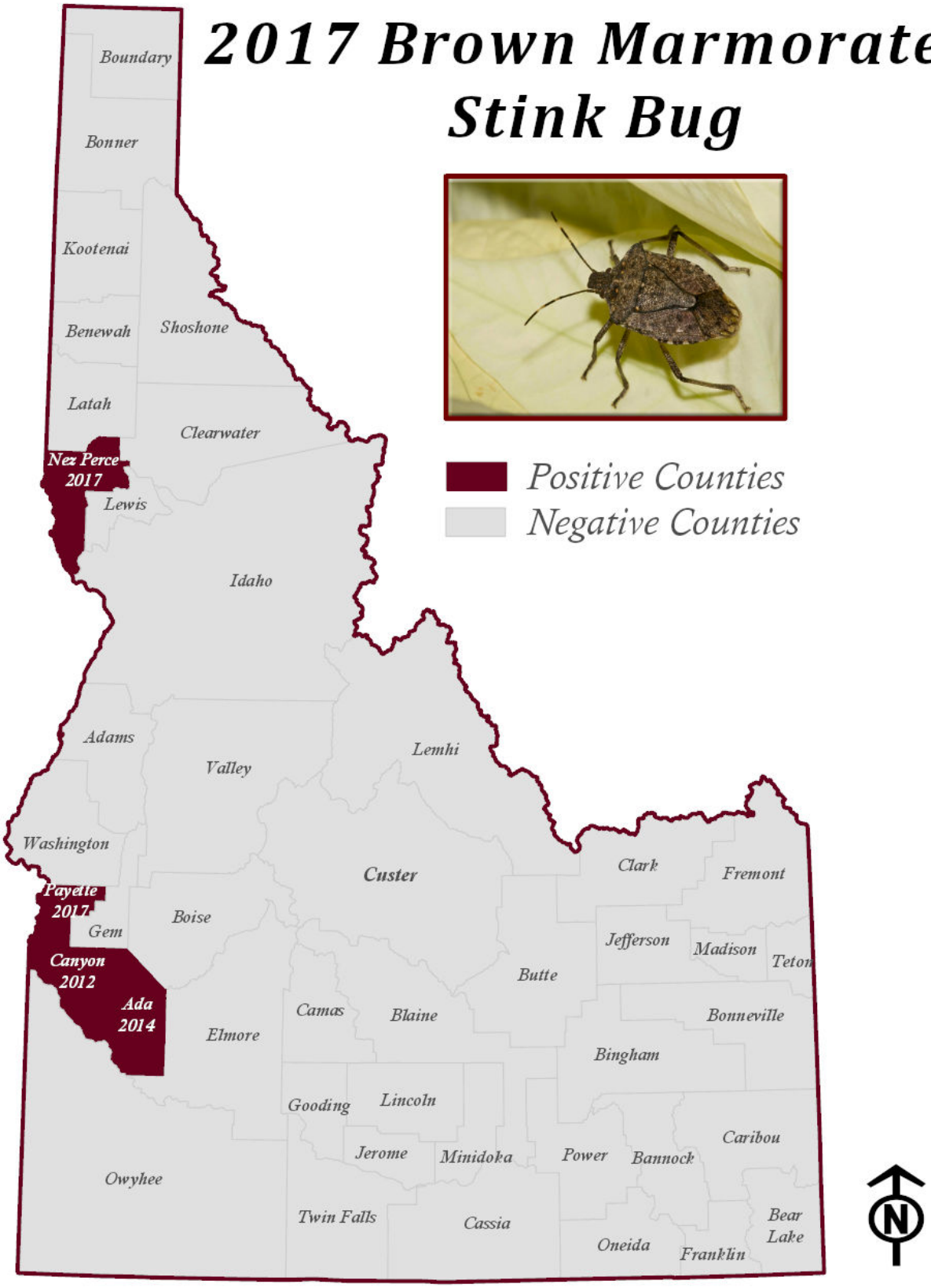
Apple Maggot Quarantine Line

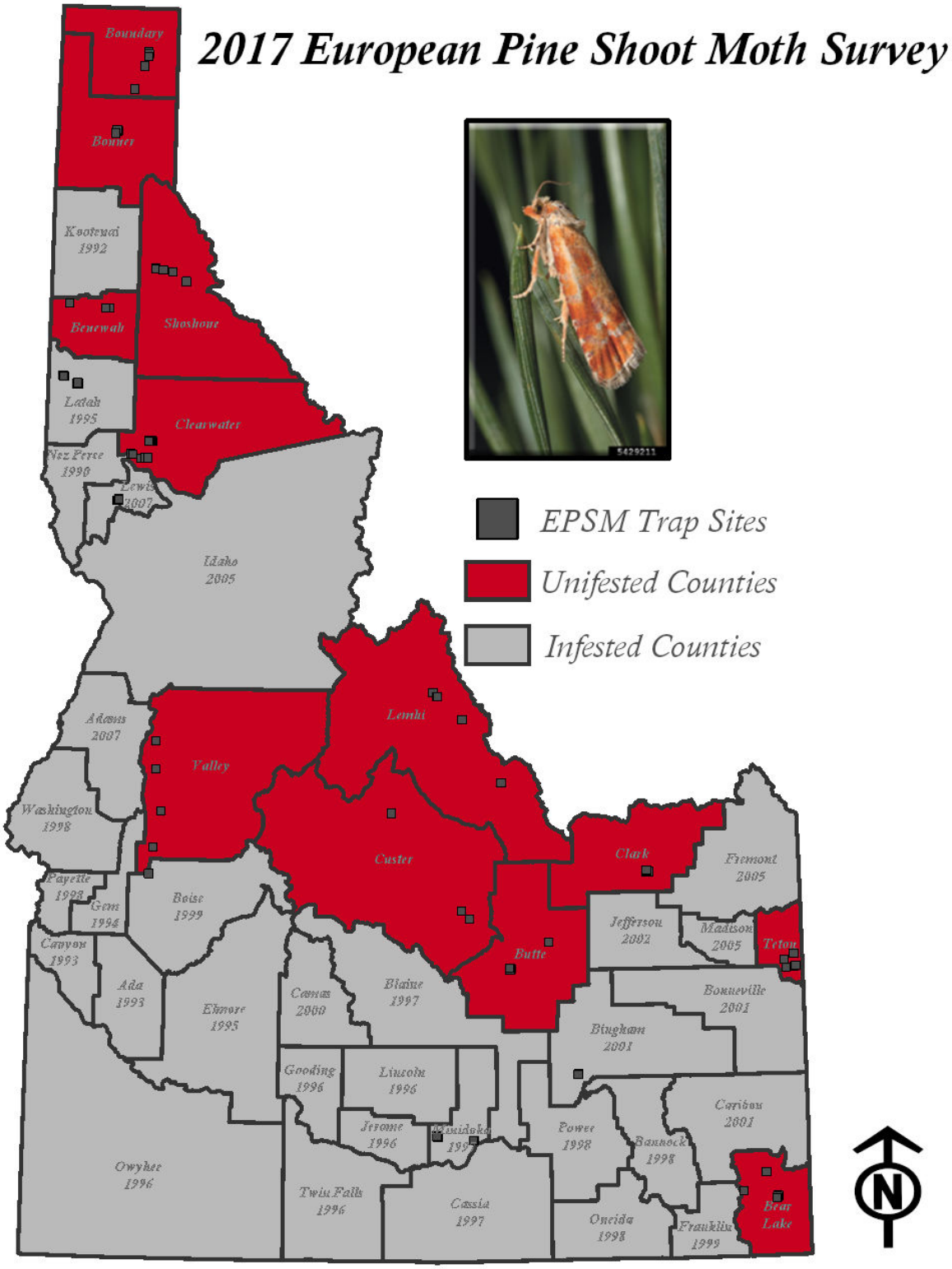


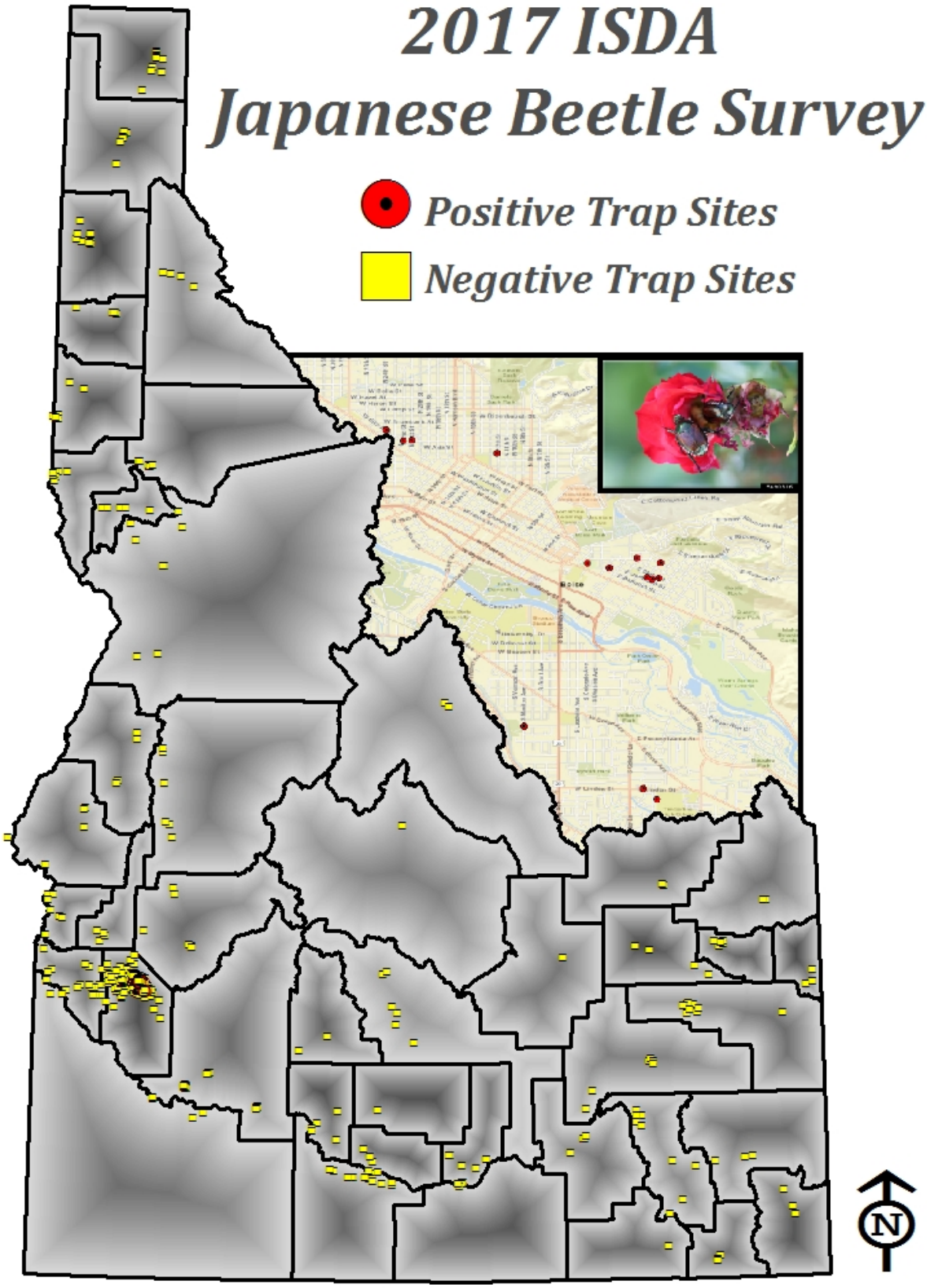
2017 Brown Marmorated Stink Bug

Positive Counties

Negative Counties



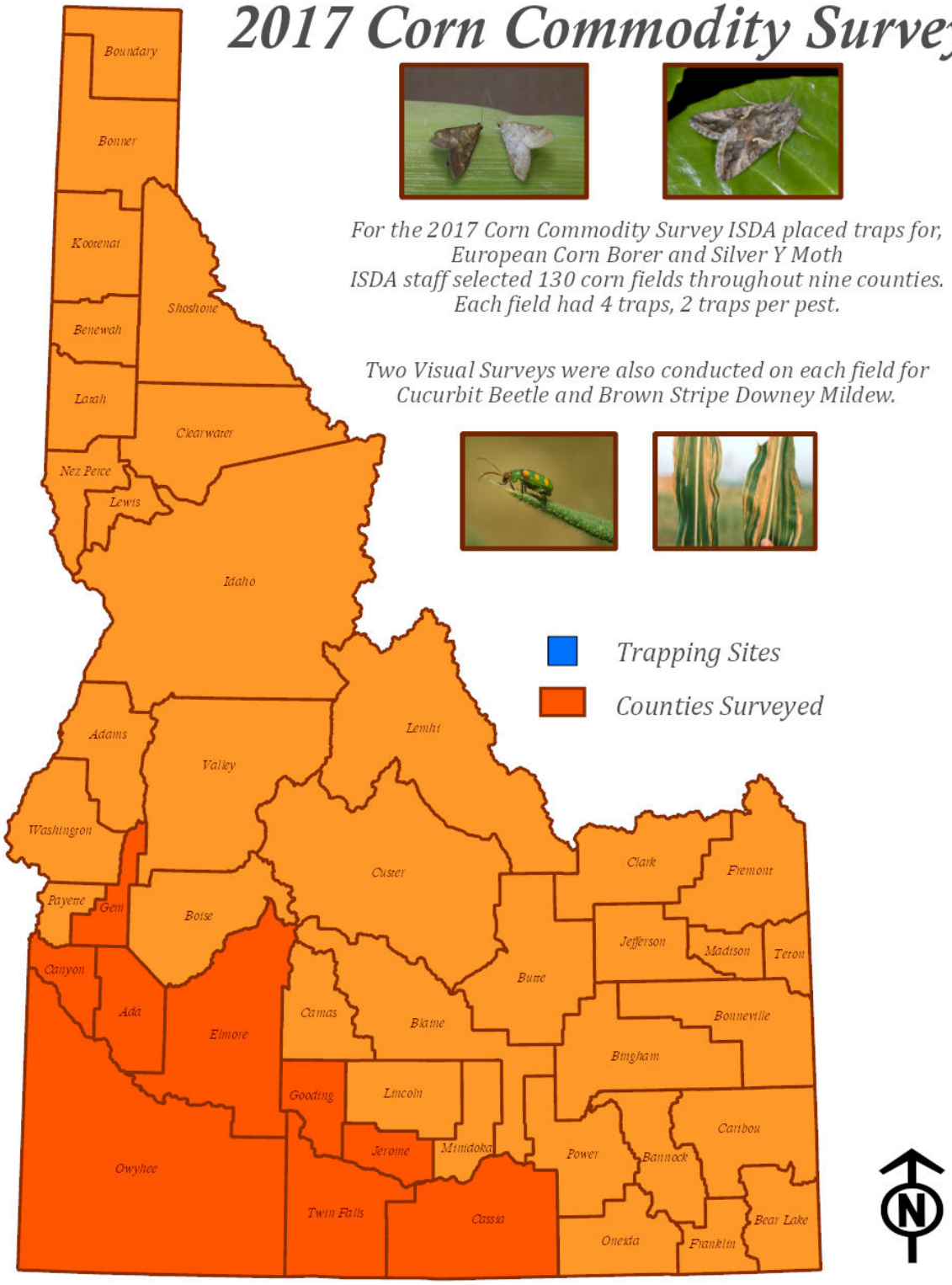

2017 European Pine Shoot Moth Survey
EPSM Trap Sites
Unifested Counties
Infested Counties
Boundary
Bonner
Kootenai 1992
Benewah
Shoshone
Latah 1995
Clearwater
Nez Perce 1990
Lewis 2007
Idaho 2005
Adams 2007
Washington 1998
Payette 1993
Gem 1994
Boise 1999
Canyon 1993
Ada 1993
Elmore 1995
Valley
Lemhi
Custer
Clark
Fremont 2005
Jefferson 2002
Madison 2005
Teton
Butte
Camas 2000
Blaine 1997
Bonneville 2001
Bingham 2001
Gooding 1996
Lincoln 1996
Jerome 1996
Minidoka 1997
Power 1998
Bannock 1998
Caribou 2001
Owyhee 1996
Twin Falls 1996
Cassia 1997
Oneida 1998
Franklin 1999
Bear Lake
N


2017 ISDA
Japanese Beetle Survey
Positive Trap Sites
Negative Trap Sites
N

2017 Corn Commodity Survey

For the 2017 Corn Commodity Survey ISDA placed traps for, European Corn Borer and Silver Y Moth
ISDA staff selected 130 corn fields throughout nine counties.
Each field had 4 traps, 2 traps per pest.

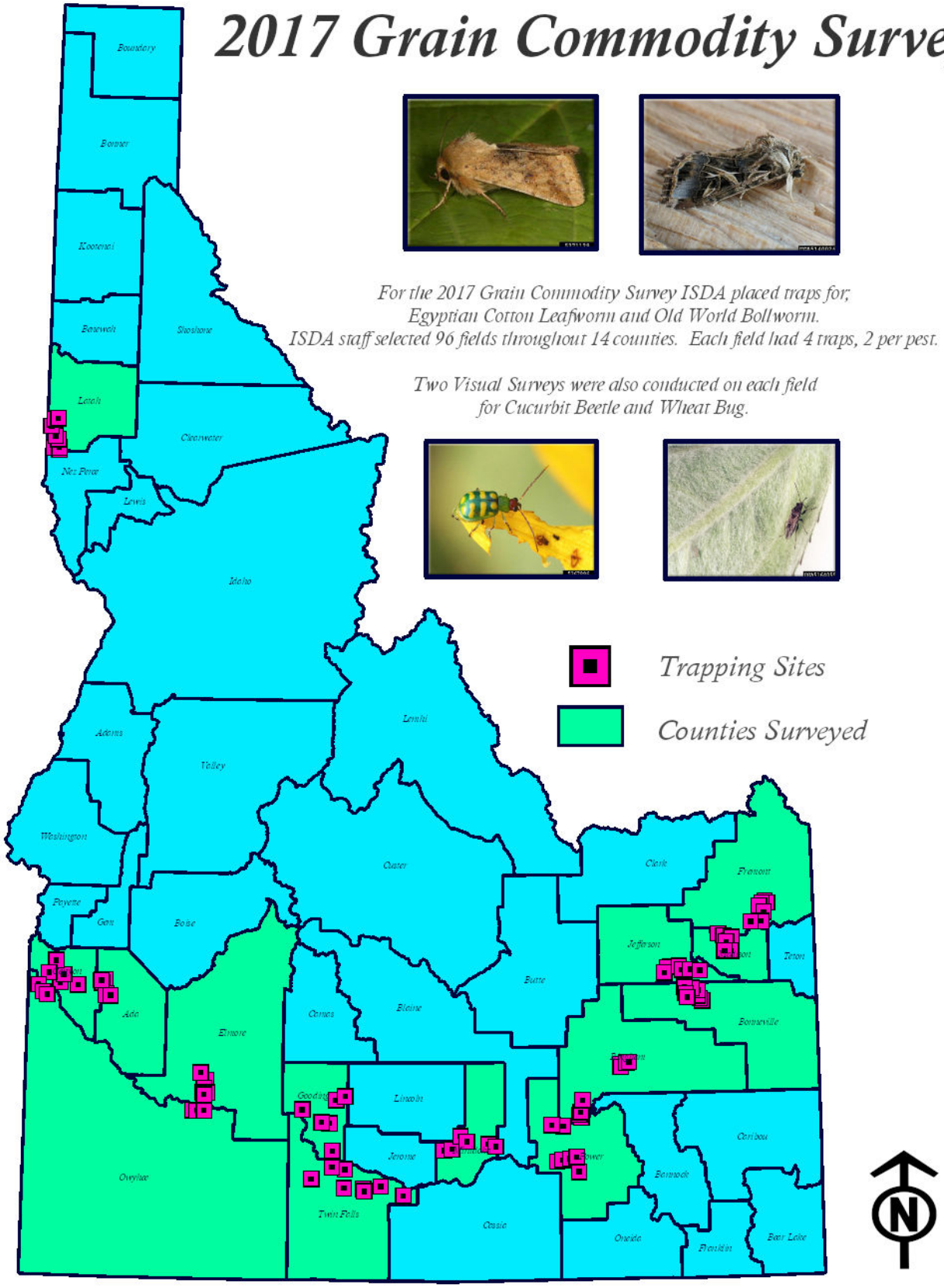
Two Visual Surveys were also conducted on each field for Cucurbit Beetle and Brown Stripe Downey Mildew.



2017 Grain Commodity Survey

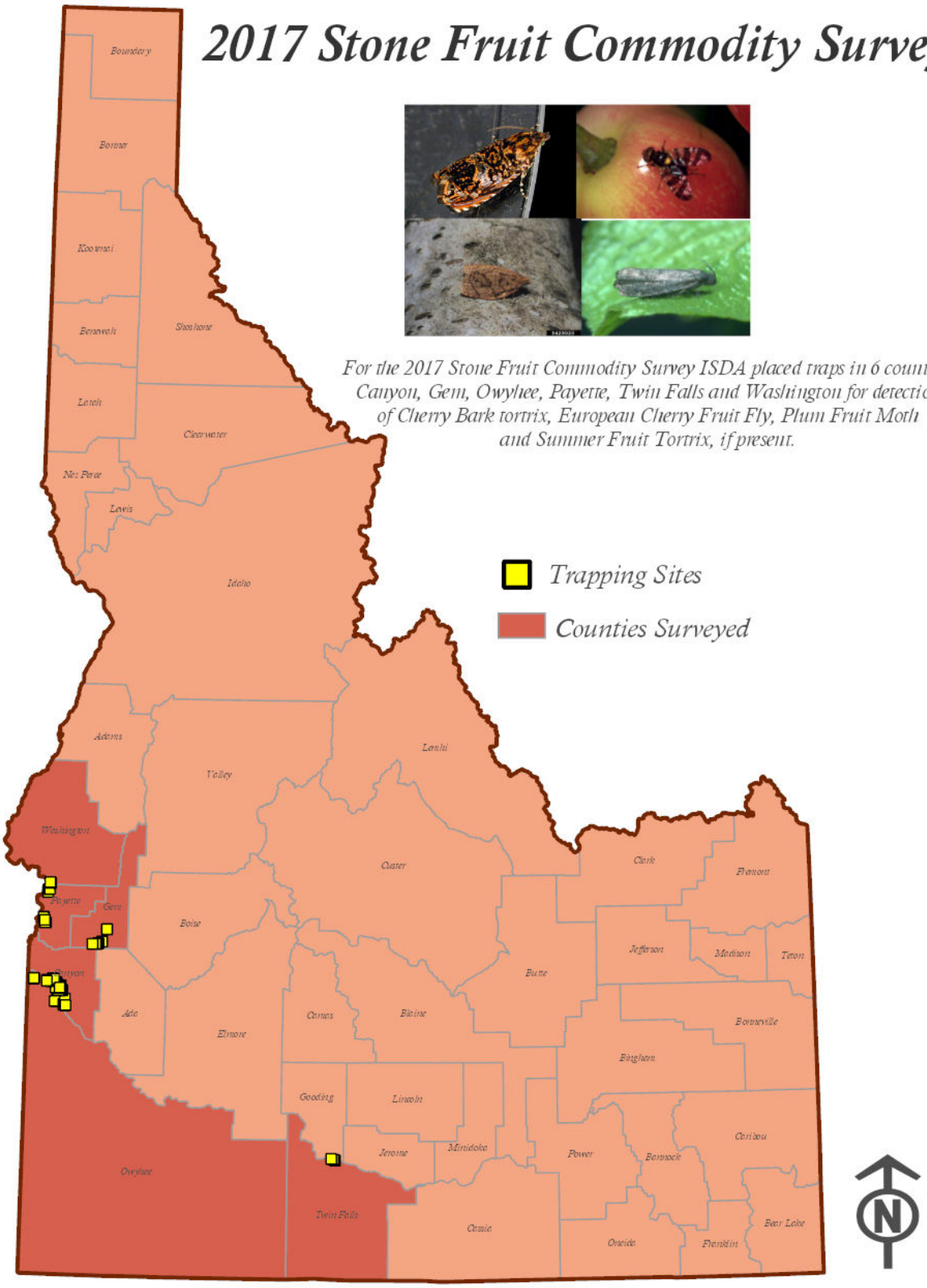
For the 2017 Grain Commodity Survey ISDA placed traps for;
Egyptian Cotton Leafworm and Old World Bollworm.
ISDA staff selected 96 fields throughout 14 counties. Each field had 4 traps, 2 per pest.

Two Visual Surveys were also conducted on each field
for Cucurbit Beetle and Wheat Bug.



2017 Stone Fruit Commodity Survey

For the 2017 Stone Fruit Commodity Survey ISDA placed traps in 6 counties: Canyon, Gem, Owyhee, Payette, Twin Falls and Washington for detection of Cherry Bark tortrix, European Cherry Fruit Fly, Plum Fruit Moth and Summer Fruit Tortrix, if present.



2017 National Honey Bee Health Survey

Honey Bee Sample Sites

Counties Sampled