



Idaho State Department of Agriculture 2017 Grasshopper and Mormon Cricket Suppression Program Summary

Introduction

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" more commonly known as the Complaint Form, with ISDA. Once the Complaint form has been received, ISDA will evaluate their land to determine if the site has reached economic damage thresholds.

Background

Sixty-four percent of Idaho lands are managed 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) manages 11.8 million acres in Idaho, and much of that land is prime grasshopper/ Mormon cricket habitat. There is a significant area of grasshopper and Mormon cricket habitat on federal lands that border private rangeland and irrigated cropland 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 South-Central 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 that formerly was referred to as Eastern Idaho has been split, and is now designated as SC and E Idaho. For fiscal years 2017 and 2018, ISDA has a statewide contract for Drexel 5% Carbaryl bait.

ISDA utilizes electronic data collection to maintain an electronic record of incoming complaints and the evaluation of properties. The electronic complaint form continues to be posted on the ISDA Grasshopper/Mormon cricket website and has been utilized by many landowners. The data collection tools used in the field has improved efficiency by allowing data to be entered into the system once and providing a structured way to track complaints and responses. In addition, GIS points are available to identify known Threatened and Endangered Species locations that could impact treatment options.

Carbaryl 5% bait (referred as "bait" in the rest of the report) was the only insecticide distributed to landowners, and applied by ISDA ground treatment staff. The bait was stored at six different

locations 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.

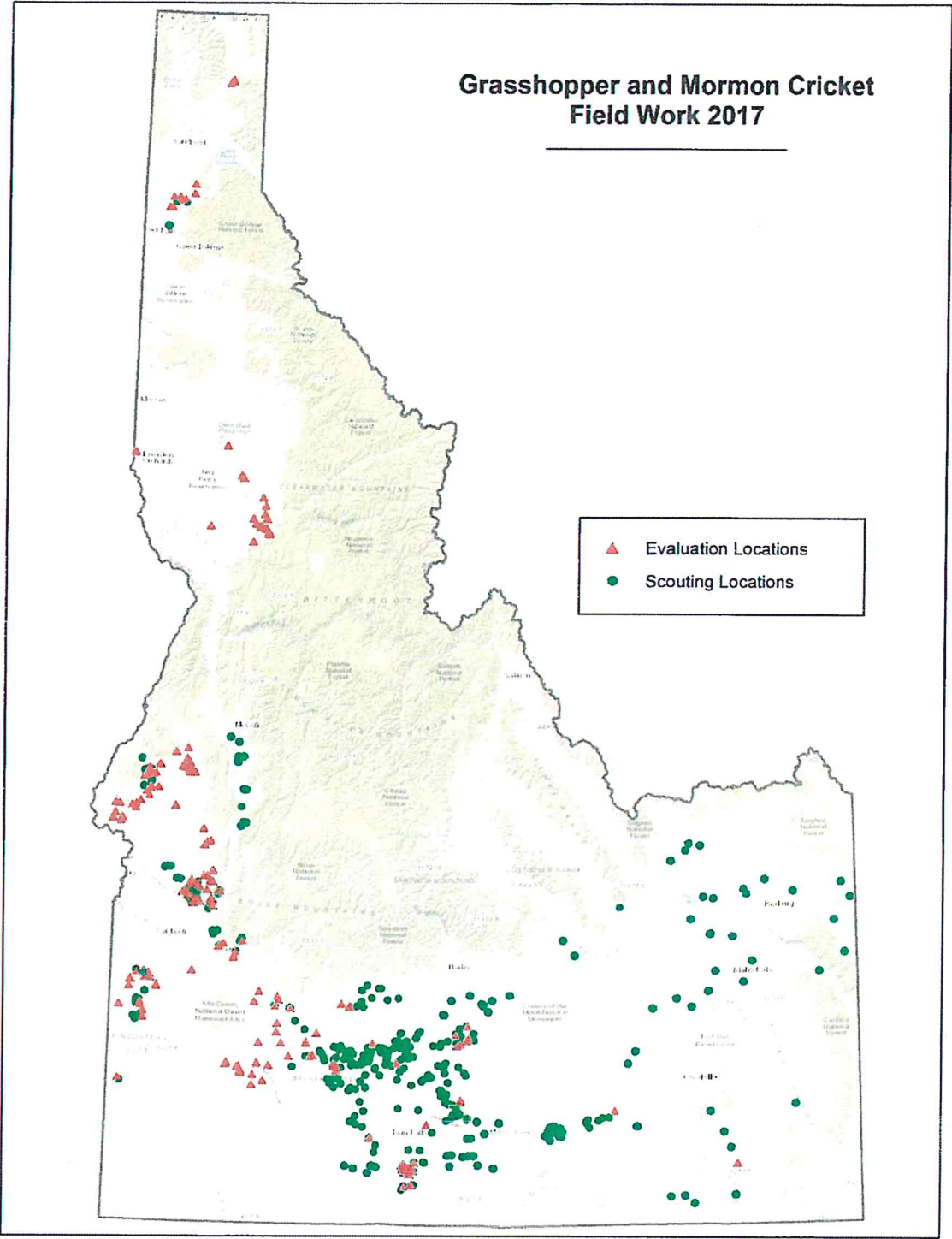
University of Idaho Extension offices in Elmore, Franklin, Idaho, Nez Perce, and Latah counties continued to be strong partners in the program, fielding complaints using the new electronic forms and forwarding them to ISDA. County Weed Control offices in Elmore, Franklin, Gem, and Kootenai Counties agreed to store and distribute bait to approved landowners on behalf of the ISDA. The ISDA seasonal temporary Pest Detection Specialists (PDS) were located across the state in strategic locations to respond to complaints and survey known infestation areas. 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 were distributed to landowners in 19 counties; less than the total of 76,090 lbs that was distributed in 2016. In addition to the bait that was distributed through the ISDA, we also reimbursed five landowners for insecticides that they purchased and applied on their own. No county or state road Rights-Of-Way were treated by the ISDA for grasshopper infestations. ISDA was able to scout 446 sites statewide and conduct surveys for both grasshoppers and Mormon crickets simultaneously. 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 below details the geographic location of surveying and evaluations of both grasshopper & Mormon cricket complaints combined.

Grasshopper and Mormon Cricket Field Work 2017



Summary of Grasshopper Actions by Region

Northern Idaho

Northern Idaho received more precipitation than normal during the winter and spring of 2017, especially February and March, and it was also colder than normal. The first day above 50 °F; the temperature at which grasshopper development begins; was on March 28th, 2017. The first grasshopper complaint was received on June 9th, 2017. There were 38 complaints across 6 counties; of those 30 met the ISDA requirements and wished to receive assistance in the form of bait. Total bait distribution in Northern Idaho was 7,040 lbs; which was marginally more than the 5,920 lbs that were distributed in 2016. 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 West Idaho

Southwestern Idaho received more precipitation than normal during the winter and spring and it was much colder than normal in January, however, the remainder of the winter and spring months were normal. The first day above 50 °F was on February 6th, 2017. Scouting began in Gem County in late-March, but the first grasshopper complaint was received on June 5th, 2017 in the Mesa area in Adams County. There was a total of 71 complaints across 7 counties, and 64 of those complaints met the ISDA threshold requirements and wished to receive assistance in the form of carbaryl bait. The total bait distribution in South Western Idaho was 49,110 lbs; which was significantly more than the 40,080 lbs of bait that were distributed in 2016. Washington County and Elmore County saw the most activity for the Southwestern Idaho area this year. 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, and it was colder than normal in January; however; it was then warmer than normal February and March. The first day above 50 °F was on February 9th, 2017. Scouting began the first week of May, and the first complaint was received in Hammett, in Elmore County on June 9th 2017. There were 27 complaints across 7 counties, and 15 of those 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; which was a significant decrease from the 2016 total of 29,690 lbs. 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, located adjacent to the junction of Highway 84 and Highway 86 in Cassia County, 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, and it was colder than normal in January. Scouting began in mid-May, and the first complaint was received in Swan Lake, which is located in Bannock County on July 31st, 2017. There were only 2 complaints this region, and only 1 landowner met the ISDA requirements and wished to receive assistance in the form of carbaryl bait. The total bait distribution in Eastern Idaho was 200 lbs; which was a decrease from 400 lbs of bait distributed in 2016.

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

Grasshoppers on potatoes in Elmore County, July 13th, 2017



In summary, the cost of insecticides to assist landowners decreased in 2017; from \$83,238.21 in 2016 to \$66,654.17 for 2017. The amount of bait used in 2017, 76,090 lbs, was slightly more than the 69,630 lbs that were distributed in 2016; 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, were slightly more than 2016 total of \$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

Summary of Mormon Cricket Actions Statewide

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

In Southwestern Idaho, the first day over 41°F (temperature at which Mormon cricket development begins) was January 5th, 2017. Scouting began in Owyhee County on March 25th 2017, and the first complaint was received on May 3rd, 2017 in Cambridge.

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

ISDA ground treated the Right-Of-Way on the following State Highways:

May 10th, 2017, Highway 71, 20 miles (480 lbs), west of Cambridge

June 7th, 2017, Highway 95, 18 miles, (800 lbs), near Idaho/Oregon state line

June 14th, 2017, Highway 20, 16 miles, (920 lbs), east of Mountain Home

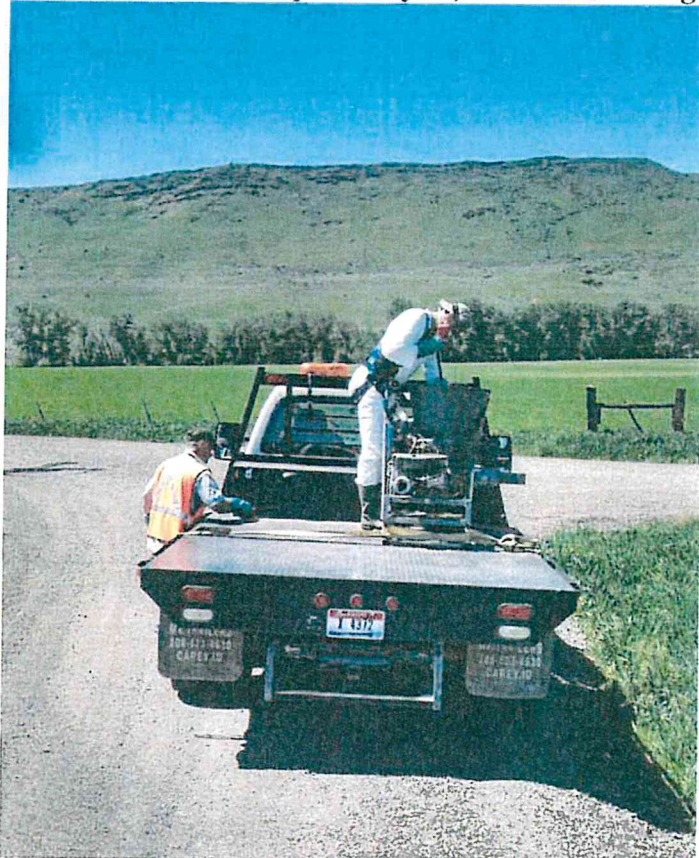
July 21st, 2017, Highway 20, 16.7 miles, (560 lbs), east of Mountain Home (same area as the June 14th, 2017 application)

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

Mormon crickets near Hardtrigger Creek, Owyhee County, March 25, 2017



Post treatment cleanup on Hwy 71, west of Cambridge, May 10, 2017



Mormon crickets on Highway 95, near Idaho/Oregon state line, ROW treatment on June 5th, 2017



Heavy Infestation of Mormon Crickets on Canyon Creek on Highway 20, Tollgate area, June 13th, 2017



In summary, the cost of insecticide distribution 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

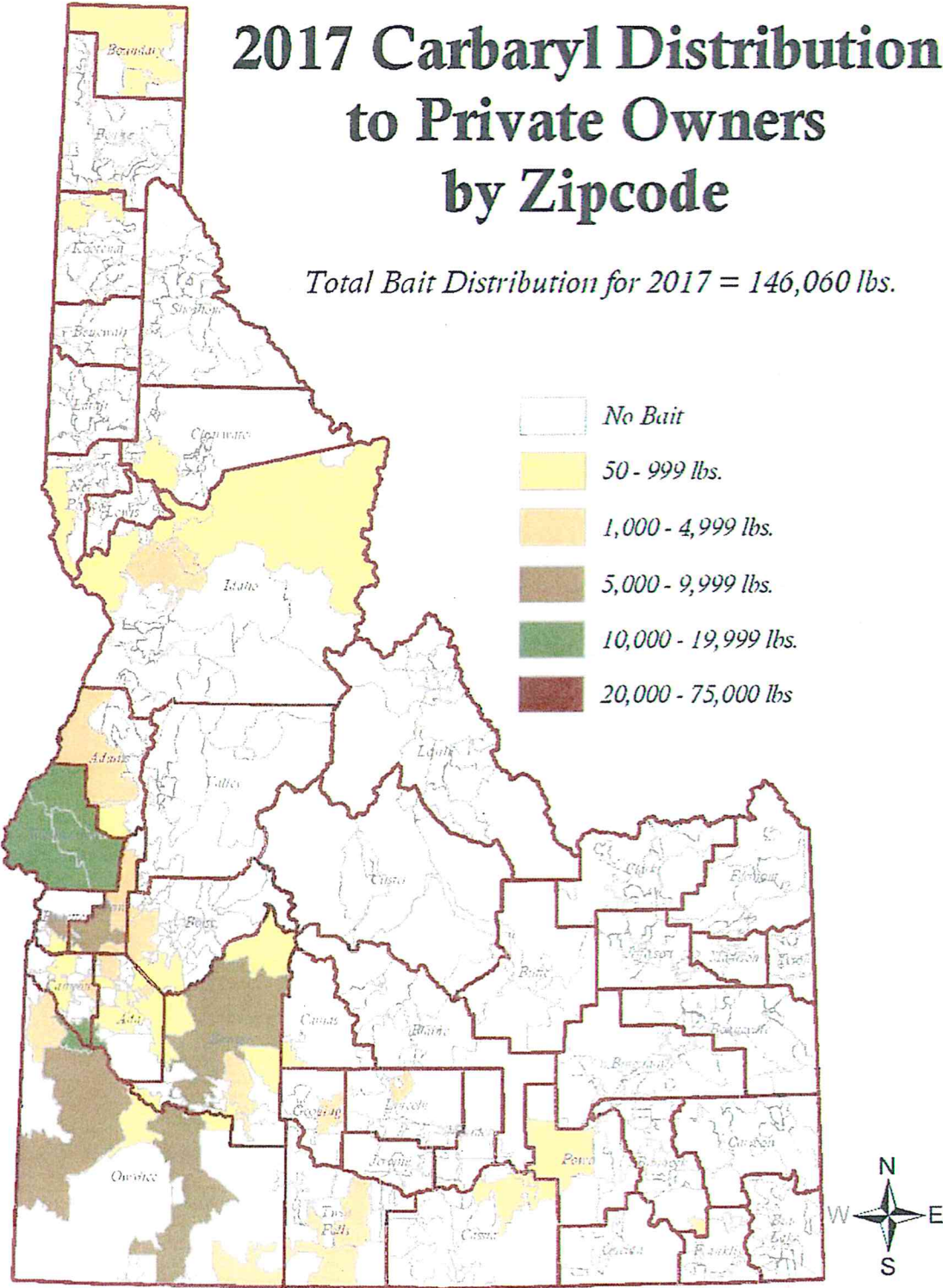
Acres Treated	Insecticides	Total Project Cost	Cost Per Acre
2,032	Chlorpyrifos Cyflurin Cobalt Advance Dimethoate 400 Lambda Cy Ag Mustang Max	\$9,627.20	\$4.74

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

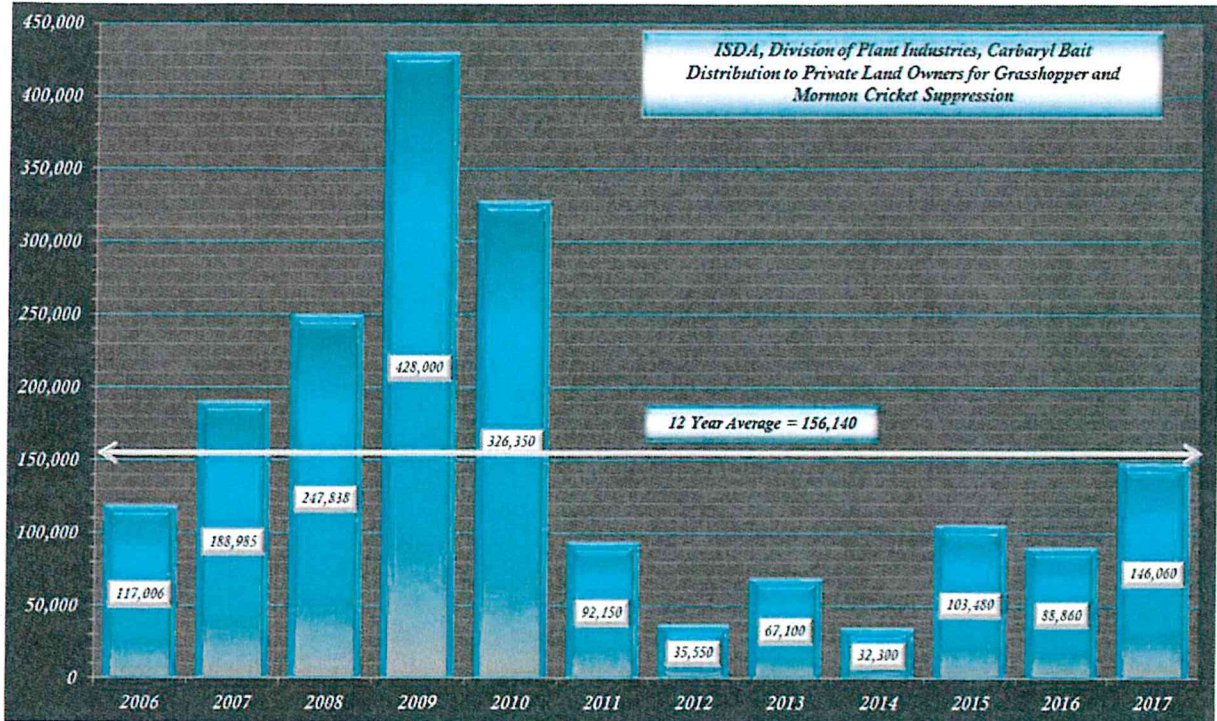
Rank	County	Number of Complaints	Number of Landowners that received bait	Carbaryl Bait Distributed (lbs)
1	Washington	33	27	59,160
2	Owyhee	38	32	25,140
3	Gem	21	18	12,600
4	Elmore	23	17	14,310
5	Boise	9	8	8,960
6	Twin Falls	10	5	6,000
7	Adams	20	20	5,600
8	Idaho	19	14	4,480
9	Gooding	4	1	2,000
10	Lincoln	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 Carbaryl Distribution to Private Owners by Zipcode

Total Bait Distribution for 2017 = 146,060 lbs.



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



2017 Grasshopper and Mormon Cricket Forecast

Northern Idaho: The below table is a 14-year history of Carbaryl 5% bait usage on private lands for both grasshopper and Mormon cricket suppression. The table shows a peak distribution in 2009, then again in 2015, and then decreasing amounts since that year. Historical data indicates that a larger economic outbreak is probable 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 for both grasshopper and Mormon cricket. The dramatic usage increase in 2017 was due to the huge outbreak of Mormon crickets. Historical data indicates that a larger economic outbreak is probable 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 for both grasshopper and Mormon cricket combined. Prior to 2015, this region included 24 counties, it now has 10 counties. Historical data indicates that a larger economic outbreak is probable 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

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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David K. Stuard 2/27/18 Bin Marsden 3/1/18
ROAR Date: ADOBR Date:
(Recipient Organization Authorized Representative) (Authorized Department Officer's Designated Representative)