



## Idaho State Department of Agriculture 2018 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) 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, South-Central, and Eastern 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 and Moscow (N), Boise (SW), Twin Falls (SC), and Idaho Falls (E). For fiscal years 2017-2019, 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. In 2018, ISDA transitioned from paper (triplicate) Bait Distribution Forms to recording this information on electronic tablets. 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) and bait distribution. 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 eight different locations around the state. When bait was not the most effective insecticide for

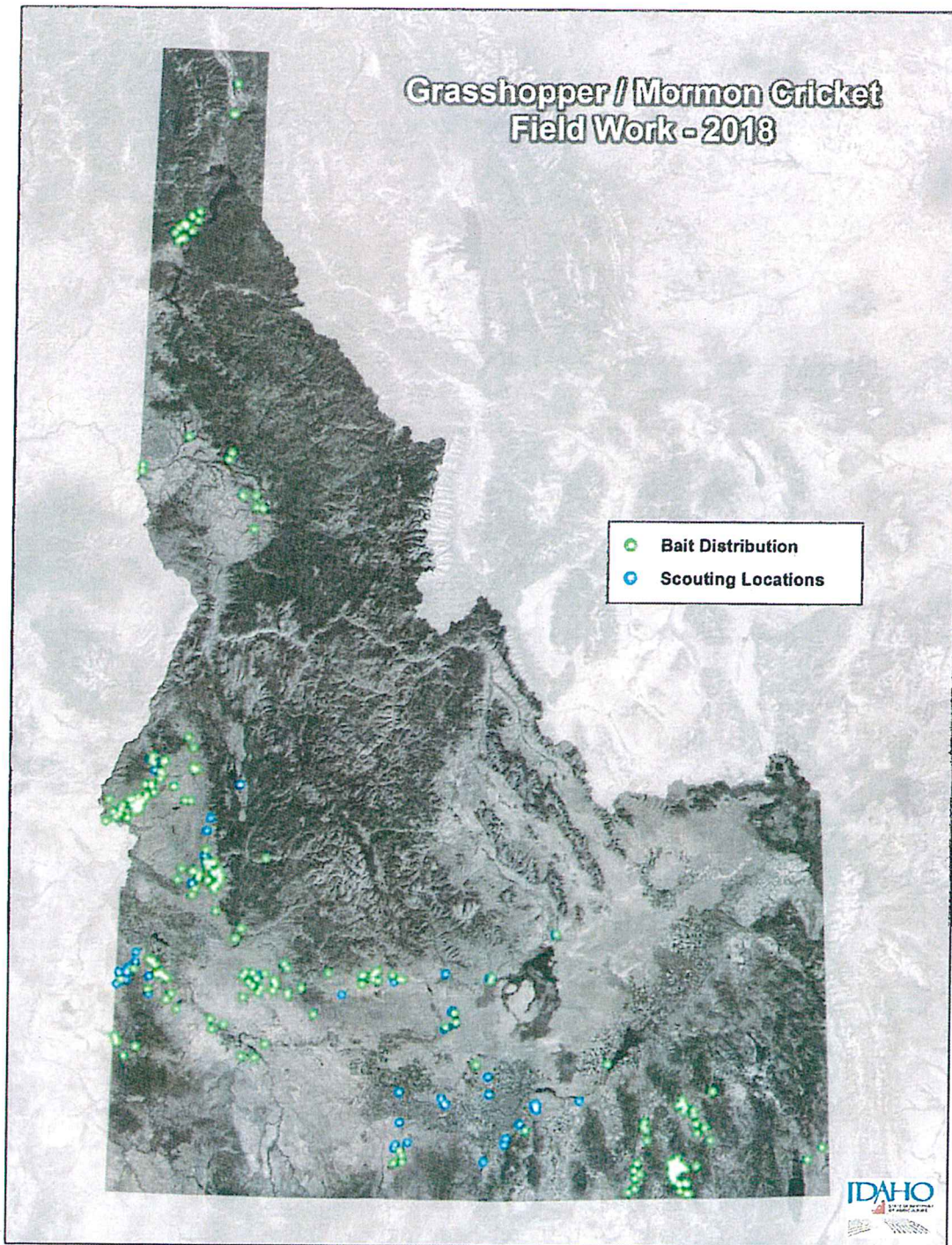
grasshopper control, ISDA reimbursed landowners for insecticide and adjuvant costs on a case-by-case basis.

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, Oneida, 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 254 landowner complaints, and 121,660 lbs of bait were distributed to landowners in 25 counties; more than the total of 69,630 lbs that was distributed in 2017. 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 84 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.



**Summary of Grasshopper Actions by Region**

**Northern Idaho**

Northern Idaho received less precipitation than normal during the winter and spring (January 1 to June 30). The month of May and June received below normal precipitation which coincided with grasshopper hatching; however, May and June were cooler than normal. The first day above 50 °F; the temperature at which grasshopper development begins; was on February 8<sup>th</sup>,

much earlier than the 30 year average of March 2<sup>nd</sup>; however, it did not consistently get over 50°F until the second week in April. The first grasshopper complaint was received on May 29<sup>th</sup>.

There were 42 complaints across 7 counties; of those 36 met the ISDA requirements and wished to receive assistance in the form of bait. Total bait distribution in Northern Idaho was 6,780 lbs; which was less than the 7,040 lbs that were distributed in 2017. Kootenai County received over half of the complaints.

#### **Northern Idaho Private Landowner Grasshopper Complaints and Bait Distribution**

<b>County</b>	<b>Number of Complaints</b>	<b>Number of Landowners that received bait</b>	<b>Carbaryl Bait Distributed (lbs)</b>
Bonner	1	1	280
Boundary	4	3	760
Clearwater	5	5	600
Idaho	7	6	1,380
Kootenai	22	18	3,360
Latah	1	1	200
Nez Perce	2	2	200
<b>Totals</b>	<b>42</b>	<b>36</b>	<b>6,780</b>

#### **Southwestern West Idaho**

Southwestern Idaho received normal precipitation during the winter and spring. It was dramatically (7°F) warmer than normal in January, however, the remainder of the winter and spring months were normal, with exception of May which was warmer than normal. The first day above 50 °F was on January 12<sup>th</sup>, which is much earlier than the 30 year average of March 2<sup>nd</sup> and there were many days that month above that temperature. Scouting began in Washington County in early April; however, the first grasshopper complaint was received on May 9<sup>th</sup> in the Grandview area in Owyhee County.

There were a total of 90 complaints across 7 counties, and 83 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 52,800 lbs; which was more than the 49,110 lbs of bait that were distributed in 2017. Elmore and Owyhee County saw the most activity for the Southwestern Idaho area this year. Camas County had widespread complaints in Fairfield. In addition, there were two landowner reimbursements in Southwestern Idaho, with applications totaling 57 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	2	2	200
Adams	8	7	2,160
Boise	18	16	7,120
Camas	14	13	4,080
Elmore	17	15	13,080
Gem	16	16	9,600
Owyhee	8	8	11,760
Washington	7	6	4,800
<b>Totals</b>	<b>90</b>	<b>83</b>	<b>52,800</b>

#### South-Central Idaho:

South-Central Idaho received normal precipitation during the winter and spring, however, April and June were below average, however, May had above precipitation. It was warmer than normal in January, May (main month for hatching), and June. The first day above 50 °F was on January 12<sup>th</sup>, which is much earlier than the 30 year average of March 15<sup>th</sup> and there were many days that month above that temperature. Scouting began the first week of May, and the first complaint was received in Burley, in Cassia County on June 13<sup>th</sup>.

There were 15 complaints across 5 counties, and 13 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 13,520 lbs; which was nearly the same for the 2017 total of 13,280 lbs. There were two landowner reimbursements totaling 166 acres.

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) and was surveyed frequently in 2018. 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)
Blaine	2	2	2,800
Butte	1	1	600
Cassia	2	1	800
Lincoln	5	5	5,160
Twin Falls	5	4	4,160
<b>Totals</b>	<b>15</b>	<b>13</b>	<b>13,520</b>

**Eastern Idaho:**

Eastern Idaho received less precipitation than normal during the winter and spring, especially in May and June, during hatching, which may explain the high populations this year in South East Idaho. Temperatures were normal with the exception of January which was dramatically warmer (10°F) and slightly warmer than normal in May. The first day above 50 °F was on January 18<sup>th</sup>, which is much earlier than the 30 year average of March 19<sup>th</sup>; however, it did not get consistently over that temperature until early February. Scouting began in mid-May, and the first complaint was received in Malad, which is located in Oneida County was on June 5th.

Oneida and Southern Bannock County experienced high levels of grasshoppers invading irrigated crops and rangeland. ISDA declared these two counties as outbreak areas which facilitated rapid distribution of bait. Bait was distributed from the Oneida County Road and Bridge facility. There were 106 complaints in this region, and 86 landowners met the ISDA requirements and wished to receive assistance in the form of carbaryl bait. The total bait distribution in Eastern Idaho was 48,560 lbs; which was an increase from the 200 lbs of bait distributed in 2017. There was one landowner reimbursement totaling 435 acres.

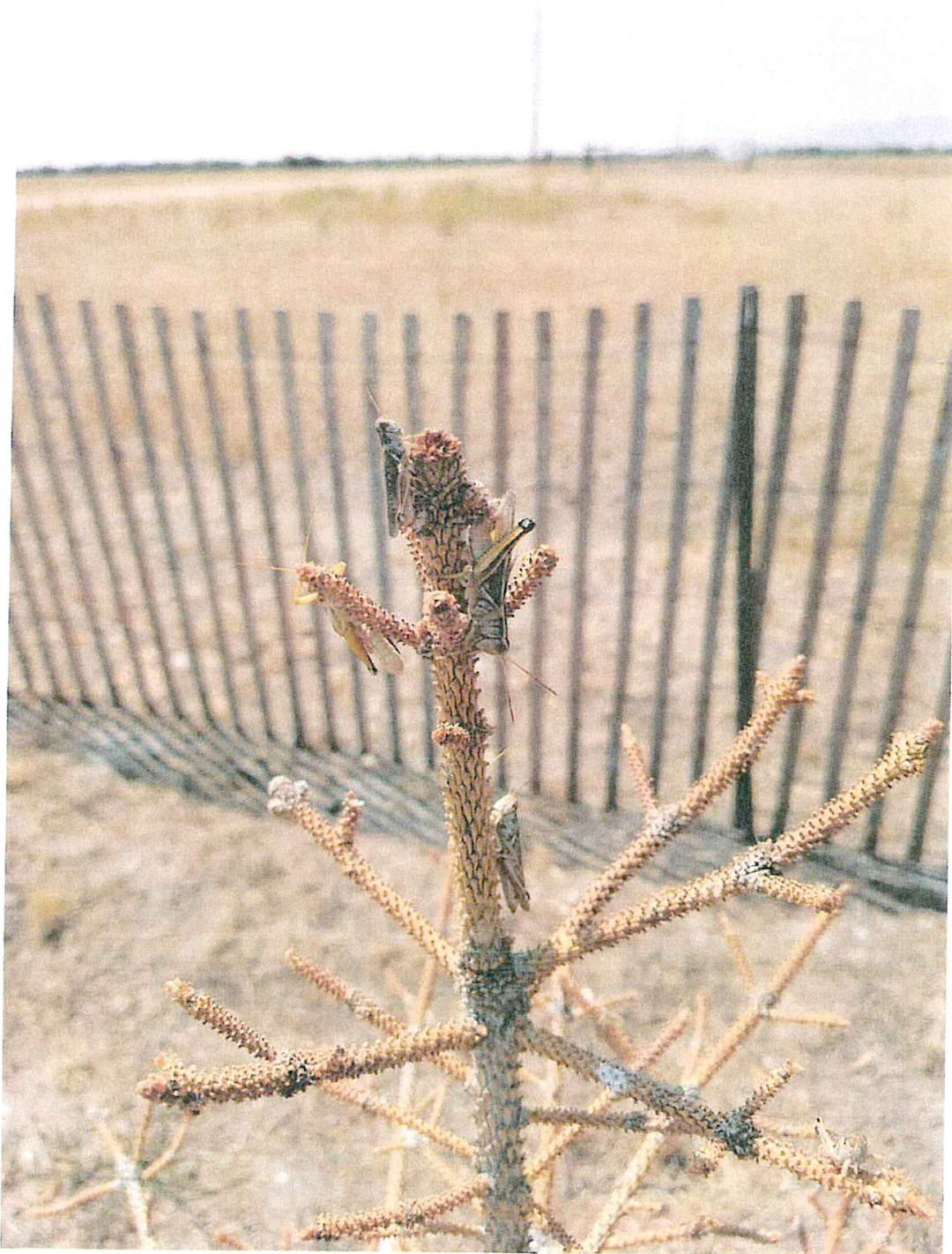
**Eastern Idaho Private Landowner Grasshopper Complaints and Bait Distribution**

<b>County</b>	<b>Number of Complaints</b>	<b>Number of Landowners that received bait</b>	<b>Carbaryl Bait Distributed (lbs)</b>
Bannock	15	14	10,840
Bear Lake	2	2	1,760
Franklin	1	0	0
Oneida	85	68	33,800
Power	3	2	2,160
<b>Totals</b>	<b>106</b>	<b>86</b>	<b>48,560</b>

**Grasshoppers on Bearded Barley in Elmore County, 7-31-18**



**Grasshoppers defoliating a pine tree in Camas County, 8-9-18**



In summary, the cost of insecticides to assist landowners increased in 2018; from \$66,654.17 in 2017 to \$105,269.54 for 2018.

The amount of bait used in 2018, 121,660 lbs, was more than the 76,090 lbs that were distributed in 2017. Landowner reimbursement costs in 2018, \$5,630.00, were less than the 2017 total of \$9,627.20.



### **Pesticides Distributed/Reimbursed Statewide for Grasshopper Control**

	<b>Lbs (\$.819 lb)</b>	<b>Value</b>
Carbaryl 5% Bait, Ground	121,660	\$99,639.54
Landowner Reimbursement Program (this program reimbursed only the insecticide & adjuvant costs) Ground & Aerial Application		\$5,629.71
<b>Total</b>		<b>\$105,269.25</b>

### **Summary of Mormon Cricket Actions Statewide**

Southwestern Idaho was the only region in the state that received Mormon cricket complaints. Southwestern Idaho received normal precipitation during the winter and spring. It was dramatically (7°F) warmer than normal in January, however, the remainder of the winter and spring months were normal, with exception of May which was warmer than normal. In Southwestern Idaho, the first day over 41°F (temperature at which Mormon cricket development begins) was January 5<sup>th</sup>, which is much earlier than the 30 year average of February 4<sup>th</sup> and every day after that (except one) was above that temperature for the rest of the month. The first complaint was received on April 5th in Washington County in Weiser and scouting began the next day in that county.

In Southwestern Idaho, there were 113 landowner complaints, of those, 98 landowners met the ISDA requirements and wished to receive assistance in the form of carbaryl bait. The total bait distribution in Southwestern Idaho in 2018 was 126,800 lbs; which was an increase from the 2017 total of 76,430 lbs.

Washington, Owyhee and Elmore Counties were where most of the activity occurred. In Washington County outbreaks were concentrated north of Weiser; where three large ranches hired an aerial applicator to apply 12,000 lbs of bait; Manns Creek Reservoir, Midvale, and Cambridge. Over 79,000 lbs were distributed in this county alone.

In Owyhee County outbreaks were concentrated in Murphy, Melba, Givens Hot Springs, and Reynolds; over 27,000 lbs of bait was distributed in this County.

In Elmore County, outbreaks were concentrated in Mountain Home, Prairie, and Mayfield. Nearly 14,000 lbs were distributed in this County.

ISDA ground treated 40 miles (1,040 lbs) of Right-Of-Way on State Highway 95 on 7-2-18 near the Idaho/Oregon state line. To treat these highway areas, ISDA worked with the Idaho Transportation Department (ITD) to secure permits and ITD lent roadside signs and APHIS provided a shadow vehicle, during treatment.

APHIS and ISDA staff preparing to treat Hwy 95 for Mormon crickets at Idaho/Oregon state line on 7-2-18



**Mormon crickets at Owyhee County Courthouse and town of Murphy, ID, 6-1-18**



In summary, the cost of insecticide distribution increased in 2018 (\$104,700.96) from 2017 (\$64,856.61). This increase is a result of the large outbreaks in Washington, Owyhee, and Elmore County.

## Southwestern Idaho Mormon Cricket Complaints and Bait Distribution

County	Number of Complaints	Number of Landowners that received bait	Carbaryl Bait Distributed (lbs)
Ada	1	1	200
Boise	2	2	520
Elmore	16	14	13,720
Gem	3	3	5,800
Owyhee	34	25	27,440
Washington	57	53	79,120
<b>Totals</b>	<b>113</b>	<b>98</b>	<b>126,800</b>

## 2018 Pesticides Distributed Statewide for Mormon Cricket Control

	Lbs (\$.819 lb)	Value
Private Landowners	126,800	\$103,849.20
State Land and Right-of-Way Treatment	1,040	\$851.76
<b>Total</b>	<b>127,840</b>	<b>\$104,700.96</b>

### Summary of ISDA Grasshopper and Mormon Cricket Program

In 2018, ISDA continued to suppress outbreaks of grasshoppers and Mormon crickets. There were 367 complaints and 306 private landowners in 24 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 (658 acres) participated in four counties.

ISDA applied Carbaryl bait on the Right-Of-Way on one state highway (Hwy 95) in 2018. In summary, the total cost of insecticides and application to assist increased in 2018 (\$209,970.21) from 2017 (\$131,510.78).

For additional information, go to the ISDA website [www.agri.idaho.gov](http://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 2018**

	<b>Lbs (\$ .819 lb)</b>	<b>Value</b>
Carbaryl 5% Bait, Ground, Private Landowners, to control grasshoppers	121,660	\$99,639.54
Carbaryl 5% Bait, Ground, Private Landowners, to control Mormon crickets	126,800	\$103,849.20
<b>Total Private</b>	<b>248,460</b>	<b>\$203,488.74</b>
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	1,040	\$851.76
<b>Total Lbs Carbaryl 5% Bait Distributed</b>	<b>249,500</b>	<b>\$204,340.50</b>
Landowner Reimbursement Program (this program reimbursed only the insecticide & adjuvant costs)	NA	\$5,629.71
<b>Total Cost of all Bait and Liquid Insecticide</b>		<b>\$209,970.21</b>

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

<i>Year</i>	<b>Total Pounds Applied</b>	<b>Acres Treated</b>
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
2018	1,040	104

**2018 Landowner Reimbursement with Private Landowners for Grasshopper Suppression**

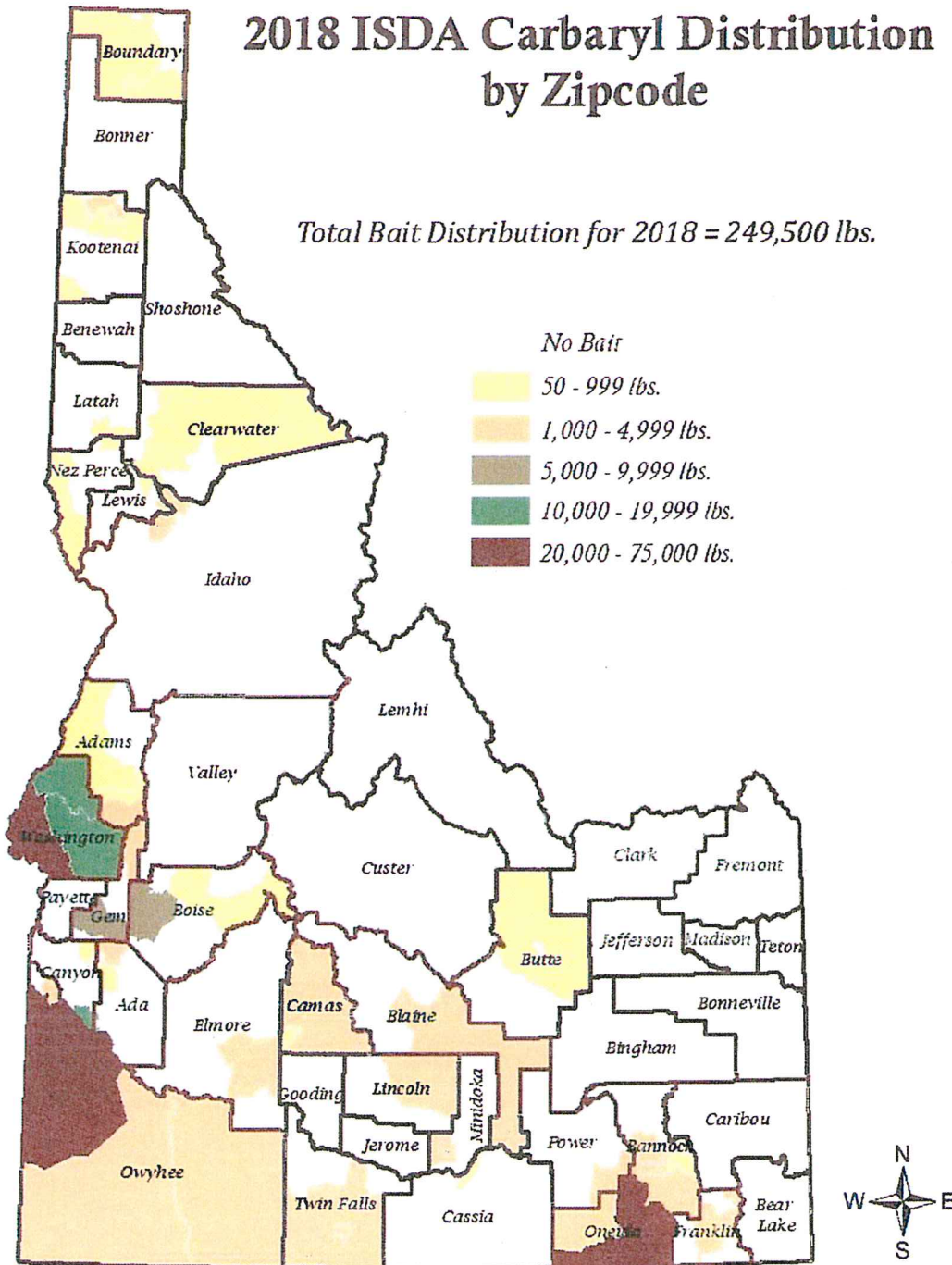
Acres Treated	Insecticides	Total Project Cost	Cost Per Acre
658	Chlorpyrifos Cyflurin Diflubenzuron (Dimilin) Dimethoate LV4 Entrust Organic Insecticide	\$5,629.71	\$8.56

**2018 Number of Complaints and Bait Distributions for Grasshopper and Mormon Cricket Suppression (this includes ROW and other State Land Applications, when applicable)**

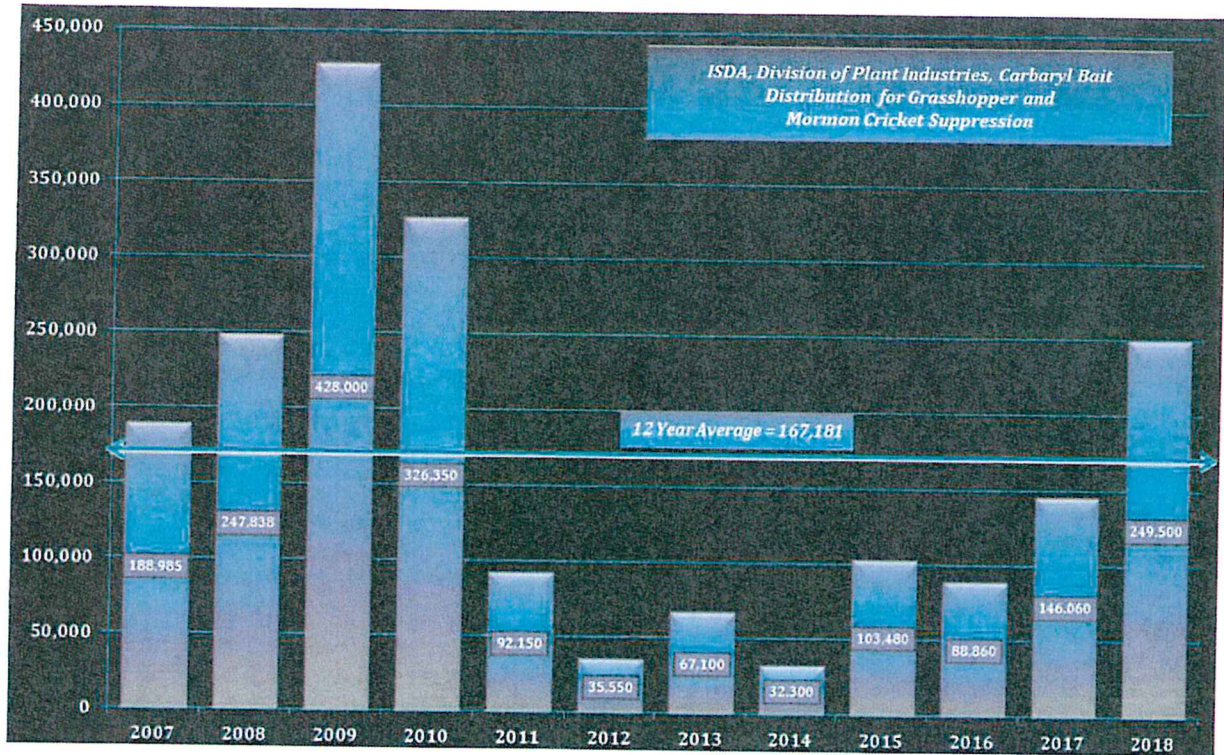
Rank	County	Number of Complaints	Number of Landowners that received bait	Carbaryl Bait Distributed (lbs)
1	Washington	64	59	83,920
2	Owyhee	43	33	40,240
3	Oneida	85	68	33,800
4	Elmore	33	19	26,800
5	Gem	19	19	15,400
6	Bannock	15	14	10,840
7	Boise	20	18	7,640
8	Lincoln	5	5	5,160
9	Twin Falls	5	4	4,160
10	Camas	14	13	4,080
11	Kootenai	22	18	3,360
12	Blaine	2	2	2,800
13-tied	Adams	8	7	2,160
14-tied	Power	3	2	2,160
15	Bear Lake	2	2	1,760
16	Idaho	7	6	1,380
17	Cassia	2	1	800
18	Boundary	4	3	760
19-tied	Butte	1	1	600
20-tied	Clearwater	5	5	600
21	Ada	3	3	400
22	Bonner	1	1	280
23-tied	Latah	1	1	200
24-tied	Nez Perce	2	2	200
25	Franklin	1	0	0
<b>Totals</b>		<b>367</b>	<b>306</b>	<b>249,500</b>

# 2018 ISDA Carbaryl Distribution by Zipcode

Total Bait Distribution for 2018 = 249,500 lbs.



**ISDA, Division of Plant Industries, Carbaryl Bait Distribution for Grasshopper and Mormon Cricket Suppression**



**2018 Grasshopper and Mormon Cricket Forecast**

**Northern Idaho:** The below table is a 15-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 a steady amount 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
2018	7	6,780
<b>Avg.</b>	<b>5</b>	<b>36,544</b>

**Southwestern Idaho:** The below table is a 15-year history of Carbaryl 5% bait usage on private lands for both grasshopper and Mormon cricket. Bait usage peaked in 2010 and then decreased for six years, however, Mormon cricket outbreaks in 2017 and 2018 has shown that larger economic outbreaks are reoccurring over time.

**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
2018	8	180,640
<b>Avg.</b>	<b>7</b>	<b>103,412</b>

**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). Bait usage has been steady for the last two years. Historical data indicates that a larger economic outbreak is probable at some point.

**South-Central Idaho**

Year	Number of Counties	Lbs Distributed
2015	2	6,750
2016	6	29,690

2017	7	13,280
2018	5	13,520
<b>Avg.</b>	5	18,220

**Eastern Idaho:** The below table is a 15-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. Bait usage peaked in 2010, then dropped off dramatically for seven years, the grasshopper outbreak of 2018, showed that larger economic outbreaks are reoccurring over time.

**Eastern Idaho**

<b>Year</b>	<b>Number of Counties</b>	<b>Lbs Distributed</b>
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
2018	5	48,560
<b>Avg.</b>	4	25,954

## Major Cooperators for the Grasshopper/Mormon Cricket Program

During the 2018 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
- Oneida County Road and Bridge
- Oneida 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

### **Program Contacts:** ISDA, Plant Industries Division

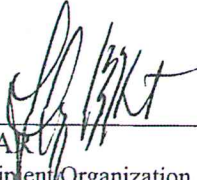
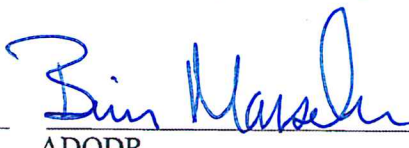
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 _____ ROAR (Recipient Organization Authorized Representative)	Date: 2/14/19	 _____ ADODR (Authorized Department Officer's Designated Representative)	Date: 2/15/19
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