

**2002 Western Region Statistics Report – Grasshoppers and Mormon Crickets**  
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**Grasshopper Program Summary:**

Fiscal Year 2002 was the first year since 1993 that PPQ was funded for the Grasshopper & Mormon Cricket Program (GH & MC, hereafter referred to as the GH Program). USDA-APHIS-PPQ is authorized under the Plant Protection Act (PPA) to protect rangeland from economic infestations of grasshoppers. In 2002, program funds to PPQ's Western Region were used in 17 states, first, for field survey activities and technical assistance (e.g., survey data, available treatments, RAATs development), and second, for limited treatment activities in Idaho, Nevada, Washington and Utah to suppress GH populations on rangeland.

Surveys were conducted in 17 states, starting as early as March and as late as September. These field surveys included: (1) Mormon cricket survey, (2) GH nymph survey (in early-season), and (3) GH adult survey (in late-season). Data from the GH adult survey were used to create the 2003 Hazard Map, which is a forecasting of the potential outbreak areas in the upcoming field season. Survey data for grasshoppers and Mormon crickets were collected digitally with handheld PDA and GPS units, then data were transmitted in electronic form to the PPQ's Western Regional Office for producing national and state maps on a weekly basis. WR Office then emailed these weekly and cumulative maps to PPQ State Plant Health Directors who circulated the maps to cooperators and interested parties in their respective states.

APHIS-PPQ prepared environmental documents for the GH Program, including: Environmental Impact Statement (EIS), completed; Memorandum of Understand (MOU) with Forest Service, completed; MOU with BLM, underway; Biological Assessment, ongoing; Environmental Assessments (EA) underway by PPQ State Plant Health Directors' offices, following a template prepared by Environmental Services (Riverdale Headquarters).

Decisions by PPQ to conduct treatments on federal and on State and/or private rangeland were made only when: (1) these treatments were requested by the respective land manager, (2) PPQ determined that such treatments would be economically beneficial, and (3) sufficient PPQ funds were available for the treatments. Therefore, PPQ treated large rangeland blocks or incipient populations ("hot spots") following cost-sharing ratios as outlined in the Plant Protection Act: PPQ paid 100% on federal land, 50% on state land, and 33% on private land.

The following treatments were used by PPQ for suppressing GH & MC populations. RAATs (Reduced Area and Agent Treatments, with skip swaths) was recommended for treatment application whenever suitable. Treatment chemicals included: (1) No treatment, (2) Carbaryl ULV as Sevin XLR, 12-16 fl oz (complete coverage) or 8 to <16 fl oz (RAATs), (3) Carbaryl selective insecticide (Bait or Bran), 10 lbs of 5% (complete coverage) or 10 lbs of 10% to 5% (RAATs), (4) Malathion, 8 fl oz (complete coverage)

or 4 to <8 fl oz (RAATs), (5) Dimilin, 1 fl oz (complete coverage) or 0.75 to <1 fl oz (RAATs). Depending on the particular program, insecticides were applied by ground or aerially.

In 2002, treatment programs were conducted in five states. A total of 22,924 acres (= 44,686 RAATs acres) were treated for grasshoppers, and a total of 25,277 acres (= 36,686 RAATs acres) were treated for Mormon crickets.

**Total Treatments by States.**

<b>State</b>	<b>Acres for GH</b>	<b>RAATs Acres for GH</b>	<b>Land Owner-ship</b>	<b>Acres for MC</b>	<b>RAATs Acres for MC</b>	<b>Land Owner-ship</b>
Idaho	250	500	BLM	20	40	BLM
Nevada	0	--		7,585	7,585	BLM
Oklahoma	600	600	Private	0	0	
Utah	22,074	43,586	BLM	17,537	28,926	BLM
Washington	0	0		135	135	BLM
<b>TOTAL</b>	<b>22,924</b>	<b>44,686</b>		<b>25,277</b>	<b>36,686</b>	

**Combined States' Acres with significant GH or MC populations.**

<b>Land Status</b>	<b>Acres w/ GH &gt;8 per sq yd</b>	<b>Acres w/ Mormon crickets</b>
Private:	34,741,459	770,259
State:	639,806	251,830
US Forest Service	1,626,461	265,056
US BLM	1,966,661	2,056,358
Other: Trust, BIA, Nat Park Ser	1,039,103	15,877
<b>TOTAL</b>	<b>40,013,490</b>	<b>3,359,380</b>

**State Summaries:**

**ALASKA**

No survey, no treatments.

Significant events and outlook for 2003: An unseasonably warm and dry summer resulted in calls of grasshopper damage to gardens and forage crops on private lands. No actions were taken.

**ARIZONA**

No treatments.

Adult Survey:

<b>Land Status</b>	<b>Acres w/ GH &gt;8 per sq yd</b>	<b>Acres w/ Mormon crickets</b>
Private:	10,000	
State:		
US Forest Service	5,000	
US BLM		
Other:		
<b>TOTAL:</b>	<b>15,000</b>	<b>0</b>

Significant events and outlook for 2003: Grasshopper surveys were conducted throughout the Arizona from April thru September 2002. The survey data collected revealed historically low grasshopper densities throughout most of the state except for the extreme southeastern portion of Arizona. Small economic grasshopper populations were detected on approximately 10,000 acres of private land and on 5,000 acres of Forest Service lands in parts of Cochise, Santa Cruz, and Pima counties. Overall, the data collected points toward a slight downtrend in Grasshopper densities in the central and northern parts of the state and a slight uptrend in grasshopper densities in the southeastern part of the state. All data set points were surveyed and recorded.

**CALIFORNIA**

No treatments.

Adult Survey:

<b>Land Status</b>	<b>Acres w/ GH &gt;8 per sq yd</b>	<b>Acres w/ Mormon crickets</b>
Private:	2,700,000	
State:		
US Forest Service	1,000,000	11,520
US BLM	321,120	
Other:		
<b>TOTAL:</b>	<b>4,021,120</b>	<b>11,520</b>

Significant events and outlook for 2003: Conducted the most extensive GH survey in state's history, which included all but two counties. In 2003, will probably treat, with bait, a Mormon cricket problem in Sierra and Placer Counties, adjacent to Reno, Nevada.

## COLORADO

No treatments.

Adult Survey:

Land Status	Acres w/ GH >8 per sq yd	Acres w/ Mormon crickets
Private:	1,349,168	73,594
State:	Unknown	Unknown
US Forest Service	66,153	16,536
US BLM	45,995	71,758
Other: Nat. Park Service	0	15,877
Total	1,461,316	177,765

Significant events and outlook for 2003: Five locations in Colorado may require treatments in 2003.

## IDAHO

Treatments in 2002:

County	Block Name or DWP#	GH or MC	Pesticide Formulation & Rate:	Treated Acres *	Total acres in Block (RAATs)	Land Ownership
Lincoln	DWP-ID2002-006	GH	5% carbaryl bait, 10 lbs per acre	10 A. by ground	20	BLM
Elmore & Twin Falls	DWP-ID2002-005	GH	5% carbaryl bait, 10 lbs per acre	205 A. by ground	410	BLM
Cassia	DWP-ID2002-002	GH	5% carbaryl bait, 10 lbs per acre	35 A. by ground	70	BLM
Elmore	DWP-ID2002-004	MC	5% carbaryl bait, 10 lbs per acre	20 A. by air	40	BLM
TOTAL				270	540	

\*All treatments were skip swath. Total acres = twice the acres reported as treated.

Adult Survey:

Land Status	Acres w/ GH >8 per sq yd	Acres w/ Mormon crickets
Private:	176,000	181,000
State:	0	41,000
US Forest Service	2,500	112,000
US BLM	151,000	261,000
Other:	0	0
TOTAL	329,000	595,000

Significant events and outlook for 2003: With a few exceptions, most areas of Idaho did not have heavy grasshopper infestations in 2002. There was no significant recurrence of the 2001 grasshopper outbreaks in Valley County except in areas that were not treated by

State and private programs in 2001. An incipient, potentially heavy outbreak was detected in the area south of the Snake River along the boundaries of Twin Falls, Elmore, and Owyhee Counties, and this infestation may expand in 2003. There were also significant infestations along Bennett Mountain in Elmore County, near Richfield in Lincoln County, from Elba to Almo in Cassia County, and south of Malad City in Oneida County. Species composition consisted primarily of *Aulocara ellioti*, *Oedaleontus enigma*, and *Camnula pellucida*. *Melanoplus sanguinipes* continues to occur only sporadically in significant population densities. Heavy populations of *Melanoplus bivittatus* and *Melanoplus packardii* were observed in limited areas. The infestation in Owyhee County includes *Cratypedes neglectus*. The prolonged autumn season should have allowed exceptional oviposition opportunities.

The MC infestation which has been building in the Mayfield area (Elmore County) increased in density and extent in 2002. Extremely high population levels (>2500 per sq. yd.) in the early spring were present throughout the Boise and Danskin Fronts in Elmore, Ada, and Boise Counties, and includes about 515,000 acres of rangeland. Crickets appeared in such high densities along Highway 55 near Horseshoe Bend that Boise County Emergency Services set up warning signs to alert drivers to slick road conditions. There is also an infestation of about 50,000 acres of Mormon crickets on the northern foothills of the Owyhee Mountains in Owyhee County and an emerging infestation in Oneida County south of Malad City.

PPQ received 17 official complaints from federal land managers regarding GH & MC on federal lands, and PPQ responded with four treatments. The official complaints which did not result in treatment by PPQ were because: (1) GH & MC were on private land, (2) sagebrush exceeded 5% coverage on the site, or (3) GH & MC numbers did not justify treatment. ID Dept. Agric. treated additional state lands, did a cost-share, and provided carbaryl bait to private land owners.

Environmental Documentation: Subsequent to the MOU between USDA APHIS and US Forest Service, the PPQ Boise Office prepared an Environmental Assessment (EA) for the National Forest lands infested with MC in Elmore, Ada and Boise Counties. Lower Snake BLM Region also completed an EA for MC treatments. which expanded the areas subject to treatment for Mormon crickets.

**KANSAS**

No treatments.

Adult Survey:

Land Status	Acres w/ GH >8 per sq yd	Acres w/ Mormon crickets
Private:	22,000	
State:	5,000	
US Forest Service	2,500	
US BLM	0	
Other:	0	
TOTAL	29,500	0

Significant events and outlook for 2003: GH populations were high this past year throughout KS. We had over 100 sites with populations above 8 during the adult survey, and with the drought conditions that occurred the potential for FY2003 population increases is very high. The central part of the state also experienced extremely high GH populations. Although this area has limited rangeland, we received 20-25 calls about GH from this area and the state also experienced numerous complaints. We will be evaluating the rangeland within this new area for survey potential in '03.

**MONTANA**

No treatments.

Adult Survey:

<b>Land Status</b>	<b>Acres w/ GH &gt;8 per sq yd</b>	<b>Acres w/ Mormon crickets</b>
Private:	1,950,000	
State:	200,000	
US Forest Service	350,000	
US BLM	600,000	
Other:	100,000	
Trust Land	700,000	
<b>TOTAL</b>	<b>3,900,000</b>	<b>0</b>

Significant events and outlook for 2003: Significant grasshopper numbers are increasing in a more widespread pattern throughout the state. *Camnula pellucida* was common in the mountainous western part of the state and caused damage to smaller, ranchette-type properties. Though populations were high in parts of the eastern side of the state, it was interesting that there was an obvious absence of *Melanoplus sanguinipes*, generally the most economically important species. Economic populations were the result of a variety of other species.

**NORTH DAKOTA**

No treatments.

Adult Survey:

<b>Land Status</b>	<b>Acres w/ GH &gt;8sq yard</b>	<b>Acres w/ Mormon crickets</b>
Private:	25,000	0
State:	1,000	0
US Forest Service	20,000	0
US BLM	0	0
Other:	0	0
<b>TOTAL</b>	<b>46,000</b>	<b>0</b>

Significant events and outlook for 2003: Drought conditions continue in the historical outbreak areas, with significant buildup in these areas.

**NEBRASKA**

No treatments.

Adult Survey:

Land Status	Acres w/ GH >8 per sq yd	Acres w/ Mormon crickets
Private:	6,463,500	
State:	20,000	
US Forest Service		
US BLM		
Other:		
<b>TOTAL</b>	<b>6,483,500</b>	<b>0</b>

Significant events and outlook for 2003: According to the U.S. Drought Monitor, most of Nebraska is in extreme, exception or severe drought conditions. Statistical reports have ranked this drought as the worst since 1934. In May of 2002, an usual situation occurred where overwintering grasshopper species were at economic levels at some locations. Ranchers called APHIS for assistance for control programs, but no funding was available at that time. Approximately 50,000 acres of rangeland were treated by the private owners in late May in Custer, Dawson, and Lincoln Counties. Some of these areas were already in the second year of drought. In August, limited APHIS funding was made available. Consequently the SPHD office received numerous phone calls from ranchers, farmers, and homeowners concerning grasshoppers damaging pasture, corn, soybeans and houses. Many callers told of the number of acres treated and number of times of treatment. It was not uncommon to hear of growers to spending \$10,000 on treatments (treatment costs reportedly ranged from \$1.00 to \$5.00 per acre) and treating one to five times. Informational meetings are being planned for ranchers and farmers for January and February of 2003.

**NEW MEXICO**

No treatments.

Adult Survey: no sites with populations of grasshoppers greater than 8 per sq yd. No Mormon crickets.

Significant events and outlook for 2003: GH populations were low. Plan to do a general adult survey of sentinel sites in 2003.

**NEVADA**

Treatments in 2002:

County	Block Name or DWP#	GH or MC	Pesticide Formulation & Rate:	Treated Acres	Total acres in Block (RAATs)	Land Ownership
Humboldt	NV-01-02	MC	5% Carbaryl Bate/10 lbs /acre	4,080	0	BLM
Washoe	NV-02-02	MC	SAA	3,505	0	BLM
<b>TOTAL</b>				<b>7,585</b>	<b>0</b>	

Adult Survey:

Land Status	Acres w/ GH >8 per sq yd	Acres w/ Mormon crickets
Private:	1,000	2,505
State:	0	0
US Forest Service	0	0
US BLM	1,000	3,080
Other:		
TOTAL	2,000	5,585

Significant events and outlook for 2003: Survey and control of GH & MC will be done by the Nevada Dept. of Agriculture, through a cooperative agreement with APHIS and an Interagency Agreement between APHIS and BLM. Most control programs in 2003 will be done by aerial application using RAATS.

**OKLAHOMA**

Treatments in 2002, as a RAATs demonstration (Cooperative Agreement):

County	Block Name or DWP#	GH or MC	Pesticide Formulation & Rate:	Treated Acres	Total acres in Block (RAATs)	Land Ownership
Ellis		GH	Dimilin 2L / 1oz per acre		100-300	
Jefferson		GH	Dimilin 2L / 1oz per acre		100-300	
Woodward		GH	Dimilin 2L / 1oz per acre		100-300	
TOTAL					300-900	

Adult Survey:

Land Status	Acres w/ GH >8 per sq yd	Acres w/ Mormon crickets
Private:	1,712,000	
State:		
US Forest Service		
US BLM		
Other:		
TOTAL	1,712,000	0

Significant events and outlook for 2003: OK rangelands have experienced two years of relatively high but spotty GH populations. Historically, population cycles over time, when graphed, produce a chart that looks like a roller coaster. 2002 may have been the peak and 2003 will begin a decline, or populations will be as high or higher in 2003. The outcome is pretty tough to predict accurately.

**OREGON**

No treatments.

Adult Survey:

Land Status	Acres w/ GH >8 per sq yd	Acres w/ Mormon crickets
Private:	200,000	
State:	20,000	
US Forest Service	10,000	
US BLM	150,000	
Other: F&WS	5,000	
<b>TOTAL</b>	<b>385,000</b>	<b>0</b>

Significant events and outlook for 2003: The clearwinged grasshopper, *Camnula pellucida*, continues to plague southeastern Oregon counties as drought persists. Although *C. pellucida* was not a problem in Malheur County as in the past several years, it continues as a locally severe threat in Harney, Lake, and Klamath Counties. Flood meadows in these counties remain dry and large bands are not unusual. Some growers treated with good results while others endured the devastation. OR Dept. Agric. responded to numerous complaints in Harney county, but usually nothing was done except emergency measure to protect specific crops.

Populations of other rangeland species are on the increase in Baker and Malheur counties. Principle species are the Melanopi group followed by *Aulocara elliotti*, *Oedaleonotus enigma* and *Ageneotettix deorum*. The rangeland is so dry in these areas that it is doubtful egg laying continued into September, meaning less than a full compliment of eggs was deposited. Late season survey indicated a decline in grasshopper numbers. We feel the severe drought conditions are reducing grasshopper numbers. Some infested areas were swept by wildfire, thus eliminating short term buildup in those areas.

Other than a few hot spots in Grant and Umatilla Counties, most other counties are relatively free of grasshoppers. The net result was about 200,000 acres of private and 165,000 acres of federal rangeland (mostly BLM) with economic infestation. We do not know if BLM will be interested in treating in 2003, although they have been notified.

Potential Treatment Program in 2003.

Site	Species	Acres	Ownership	County	EA
Burns	<i>Camnula</i>	15-40,000	Private	Harney	Harney Co., 1995
Whitehorse Ranch	mixed spp.	20,000	Private	Harney	Harney Co., 1995
Klamath Marsh	<i>Camnula</i>	6,000	USF&WS USFS	Klamath	Klamath & Lake Co., 1995
Brown Ridge	mixed spp.	15-20,000	State	Malheur	Baker & Malheur Co., 1995
Total		56-86,000			

## **SOUTH DAKOTA**

No treatments.

Adult Survey:

<b>Land Status</b>	<b>Acres w/ GH &gt;8 per sq yd</b>	<b>Acres w/ Mormon crickets</b>
Private:	1,139,649	
State:	39,525	
US Forest Service	3,422	
US BLM	9,567	
Other: BIA	181,247	
Corps Of Engineers	14,489	
<b>TOTAL</b>	<b>1,387,899</b>	<b>0</b>

Significant events and outlook for 2003: 2002 surveys indicated that SD currently has no large scale outbreaks. However, we did see several hot spot areas emerging in the central portion of the state, and they will be monitored in 2003. These hot spot areas will be of concern due to drought conditions and the extended fall season that allowed for continued egg laying by many of the late and intermediate grasshopper species.

## **TEXAS**

No treatments in 2002.

Adult Survey:

<b>Land Status</b>	<b>Acres w/ GH &gt;8 per sq yd</b>	<b>Acres w/ Mormon crickets</b>
Private:	16,029,361	N/A
State:	0	N/A
US Forest Service	0	N/A
US BLM	0	N/A
Other: USFWS	7,000	N/A*
<b>TOTAL</b>	<b>16,036,361</b>	

Significant events and outlook for 2003: Mormon crickets are not known to occur in Texas at this time. Environmental Assessments for Grasshopper control in Texas will be prepared by PPQ this winter. Nymphal survey will begin March of 2003.

## UTAH

### Treatments in 2002:

County	Block Name or DWP#	GH or MC	Pesticide Formulation & Rate:	Treated Acres	Total acres in Block (RAATs)	Land Ownership
Millard	UT-01-02	MC	5% Carbaryl Bait @ 10 lbs/acre	5,926	5,926	BLM/FS
Tooele	UT-02-02	MC	Dimilin – 22% @ 1 oz/acre	11,611	23,000	BLM
Millard	UT-03-02	GH	Dimilin – 22% @ 1 oz/acre	11,512	23,024	BLM
Sanpete	UT-04-02	GH	Dimilin – 22% @ 1 oz/acre	5,781	11,000	BLM
Juab	UT-05-02	GH	Dimilin – 22% @ 1 oz/acre	4,781	9,562	BLM
<b>TOTAL</b>				<b>39,611</b>	<b>72,512</b>	

### Adult Survey:

Land Status	Acres w/ GH >8 per sq yd	Acres w/ Mormon crickets
Private:	524,600	478,600
State:	47,300	209,550
US Forest Service	50,000	100,000
US BLM	242,000	1,662,500
Other:		
<b>TOTAL</b>	<b>863,900</b>	<b>2,450,650</b>

Significant events and outlook for 2003: Mormon cricket populations perhaps the largest in Utah's recorded history. In 2003, most programs will be aerial application using RAATs. Land managed by Forest Service will be ground bait programs.

## WASHINGTON

### Treatments in 2002:

County	Block Name or DWP#	GH or MC	Pesticide Formulation & Rate:	Treated Acres	Total acres in Block (RAATs)	Land Ownership
Franklin	MC001	MC	5% Bran bait @10 lbs/ac	135 Hatching beds	0	BLM
<b>TOTAL</b>				<b>135 beds</b>	<b>0</b>	

Adult Survey:

Land Status	Acres w/ GH >8 per sq yd	Acres w/ Mormon crickets
Private:	6,080	
State:		
US Forest Service		
US BLM		14,720
Other: BIA and USFS	18,560	
Total	24,640	14,720

Significant events and outlook for 2003: Overall, this year's survey showed a significant increase in the number of grasshopper and Mormon crickets in eastern Washington in comparison to 2001. The relatively warm weather and general lack of rainfall throughout the state have intensified the effects of GH & MC and is primarily responsible for the rapid buildup. PPQ ground treated 135 acres of Mormon cricket hatching beds in on BLM land in Franklin County, under an interagency agreement. The Spokane office responded to numerous complaints of GH & MC invading crops and causing extensive damage to livestock range. Grasshoppers (*Camnula pellucida*) continue to cause extensive damage to a few isolated direct seeded (no-till) barley fields in Lincoln County, requiring farmers to conduct treatments on their private land. The Spokane office coordinated the transfer of carbaryl bait to the Grant County Pest Board which then supplied the bait to producers for the control of MC infestations. In 2003, Spokane PPQ is recommending treatments of hatching beds in Grant County, where MC for the past two years have been migrating from federal land into orchards and cultivated land where they caused significant damage.

**WYOMING**

No treatments in 2002.

Adult Survey:

Land Status	Acres w/ GH >8 per sq yd	Acres w/ Mormon crickets
Private:	2,433,099	34,560
State:	311,981	1,280
US Forest Service	119,386	25,000
US BLM	443,479	43,300
Other: DOD	11,948	
National Park Service	859	
Total	3,320,752	104,140

Significant events and outlook for 2003: PPQ continued to survey and provide technical assistance in the area of GH & MC control. Seasonal scouts worked with various cooperators in order to respond to rancher and land manager complaints. As a result of early survey and response, landowners were able to obtain knowledge pertaining to their options for GH/MC control. Approximately 48,000 acres were treated privately. All treatments applied Dimilin using the RAAT's approach with 50% coverage, resulting in a total of 96,000 acres protected. Approximately 5,800 acres of BLM land were sprayed

cooperatively with the County Weed and Pest District for the control of MC, with a reduced rate of Sevin XLR Plus applied over 50% of the area.

In addition to a nymphal survey, an adult survey of the Common Data Set survey points was conducted in order to provide data for the 2003 hazard and outlook map. Data were collected electronically using a Palm Pilot and attached GPS receiver system. Data were sent to the Regional Office for producing State and National weekly update maps. Collections were also taken at these sites in order to maintain species complex data. *Melanoplus* spp, *Aulocara* spp, *Ageneotettix deorum* and *Camnula pellucida* were the main species found in outbreak numbers.

Based on survey results for 2002, several areas of major concern have been identified within Wyoming. Three counties, located in the southeast part of the State, were heavily infested with grasshoppers over the majority of the rangeland and show high potential for continued outbreaks next year. There are also areas in the northcentral part of Wyoming with smaller acres of infestation that show potential of major outbreaks of both GH and MC if conditions are right. Increased nymphal surveys are planned for early next year in hopes of detecting critical outbreak situations in a timely manner so all options, including RAATs, can be utilized for GH/MC management.