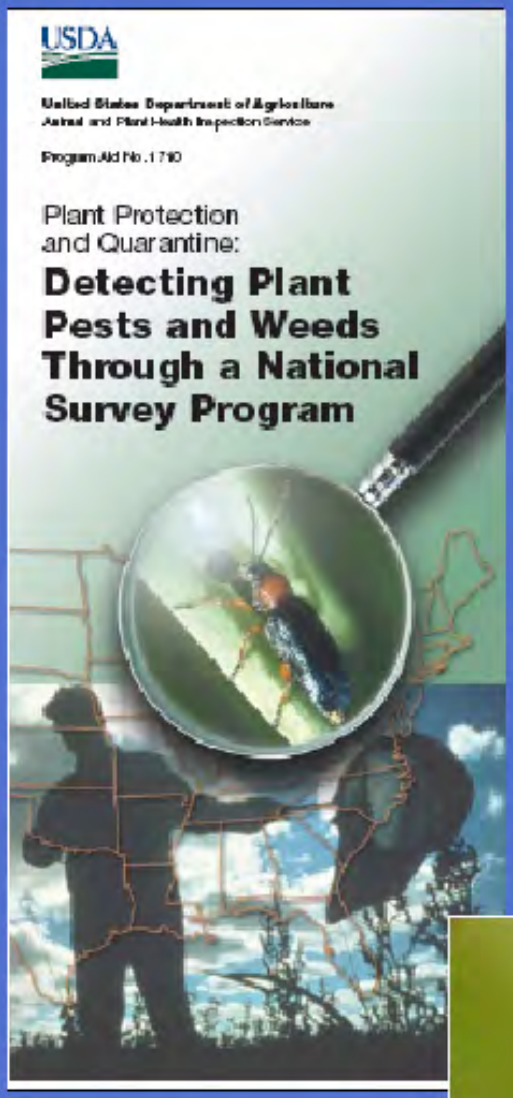
Montana Department of Agriculture
Cooperative Agricultural Pest Survey
2005 Report



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USDA Forest Service
Montana Department of Natural Resources
Montana State University
Valley County Weed District
Silver Bow County Weed District
Pondera County Weed District
Sweetgrass County Weed District

2005 Surveys

- European and Asian Gypsy Moth
- Karnal Bunt
- Japanese Beetle
- Daylily Rust
- Silver Y Moth
- Urban Spurge
- Salt Cedar
- Sudden Oak Death
- Cereal Leaf Beetle
- Cereal Leaf Beetle Biological Control
- Tree Fruit Pests
- Whitetop
- *Macinus janthinus*

This report was compiled by Patricia Denke, Michele Mettler, and Kimberly Merenz

2005 CAPS Report
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Cereal Leaf Beetle
Oulema melanopus

Cereal leaf beetle, *Oulema melanopus* (CLB) was first found in Montana over 2 decades ago. Since then, the pest has spread steadily across the state, infesting new counties every year. In most areas, CLB is a problem for grain during the period of time that the head is filling, due to feeding on the flag leaf by larvae. However, in Montana adults emerging from overwintering can also pose a problem due to feeding on emerging seedlings, sometimes to the extent of eating the entire plant.

Adult cereal leaf beetle. Approximate length 1/8 to 1/4 inch long.

During 2005, as in the past, routine surveys were taken for CLB. At least 5 samples were taken in each of the 30 surveyed counties, with a sample consisting of two sets of 50 sweeps with a 15-inch sweep net. When choosing fields to sample, preference was given to spring planted grains.

Cereal leaf beetles were found in 17 Montana counties during the 2005 sampling season. Counties that had been found positive for CLB in the past were not necessarily sampled during 2005.

Cereal leaf beetle was found for the first time in Blaine County, just north of Chinook. There were no other noted range expansions for this pest.

Larval cereal leaf beetles and light feeding damage.

Counties sampled for cereal leaf beetle during 2005, and outcome of sampling.

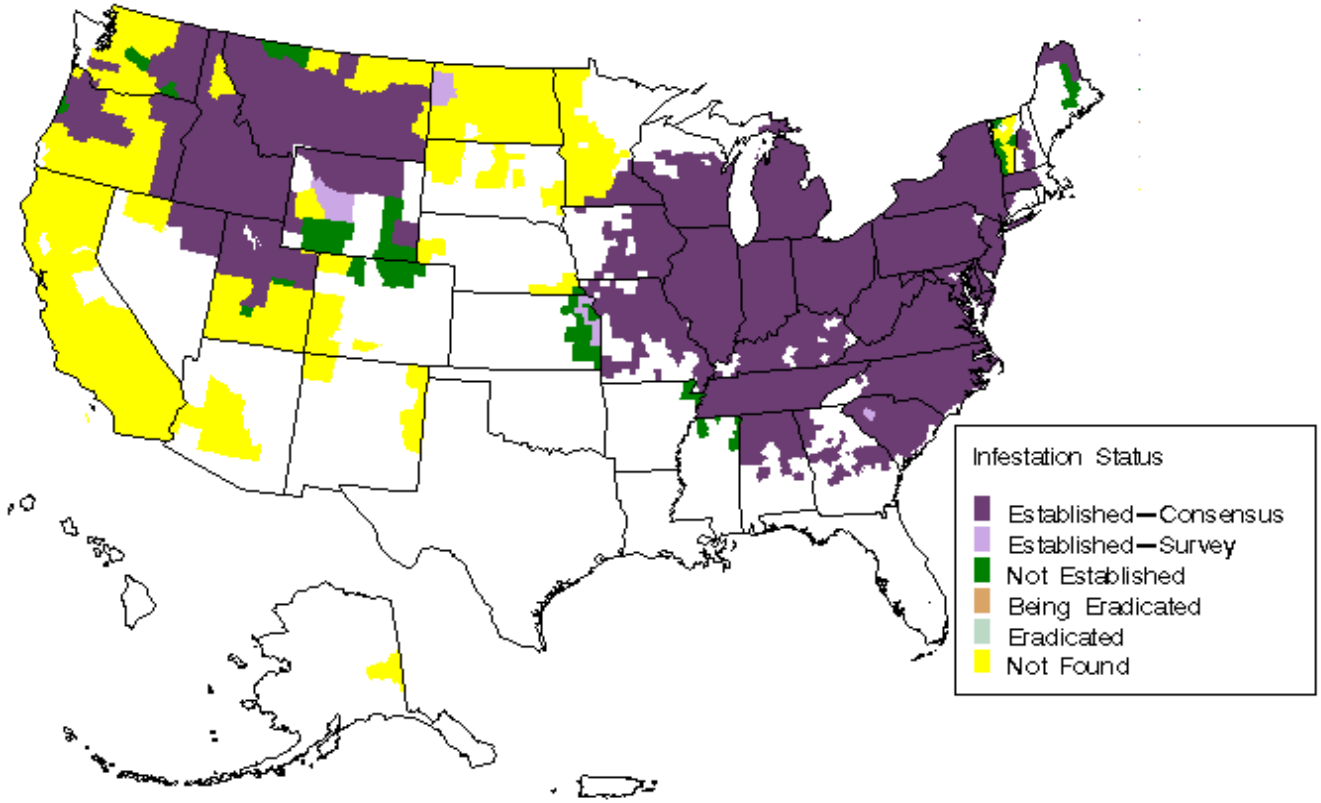
County	Present	County	Present
Big Horn	Yes	Pondera	Yes
Blaine	Yes	Powder River	No
Carbon	Yes	Prairie	No
Custer	Yes	Richland	Yes
Daniels	No	Rosebud	Yes
Dawson	Yes	Sanders	Yes
Gallatin	Yes	Sheridan	No
Glacier	No	Stillwater	Yes
Hill	No	Sweet Grass	Yes
Lake	Yes	Teton	Yes
Lewis & Clark	Yes	Toole	No
Liberty	No	Treasure	No
McCone	No	Valley	No
Missoula	Yes	Wibaux	No
Phillips	No	Yellowstone	Yes

Reported Status of

CEREAL LEAF BEETLE (CLB) , OULEMA MELANOPUS

in US and Puerto Rico

Data retrieved from National Agricultural Pest Information System on 02/27/2006



The Center for Environmental and Regulatory Information Systems does not certify the accuracy or completeness of the map. Negative data spans over last 3 years only.

Cereal Leaf Beetle Parasitoids
Tetrastichus julis & *Anaphes flavipes*

The Cereal leaf beetle has spread across much of Montana during the past two decades. While initial movement was accompanied by severe outbreaks, and economic damage, in more recent years the beetle has not been as noticeable. This may be, in part, due to the nature of the newly infested areas, which are generally drier and therefore less hospitable for the beetle immatures. It may also be due to the presence of two parasitoids released by the USDA APHIS PPQ to assist in the management of this pest.

The first of these parasitoids to be released and recovered was *Tetrastichus julis*, an internal parasitoid of the larval CLB. The larvae of *T. julis* are maggot-like, and bright orange in color. In some samples, over 80 percent of the specimens of CLB have contained parasitoids, although this varies not only from place to place, but also from day to day in the same place. Data suggest that this parasitoid is capable of movement as rapidly as CLB. In the past, some samples have had parasitism rates as high as 80 percent. However, this year had much lower average numbers, with only a single sample yielding above 80 percent.

The second parasitoid, *Anaphes flavipes* (*Anaphes*) is an egg parasitoid. Although the insect has been released at several Montana locations, the exact status is more difficult to determine, partially because of the small size of insect, and partially because CLB eggs are prone to desiccation, making it more difficult to determine when mortality is due to the parasitoid.

During routine survey for the host, egg and larval samples were taken to further our information on the distribution of these two insects. Egg samples consisted of at least 25 eggs, while larval samples consisted of any larvae found in a sample. A larval sample consisted of 2 sets of 50 sweeps each, done with a standard 15-inch sweep net. At least 5 CLB samples were taken in each county.

Counties sampled for cereal leaf beetle parasitoids during 2005 and results.

County	*T. julis*	*Anaphes*	County	*T. julis*	*Anaphes*
Big Horn	Yes	N/A	Missoula	Yes	No
Blaine	Yes	N/A	Richland	No	N/A
Carbon	Yes	N/A	Sanders	No	No
Dawson	No	N/A	Stillwater	Yes	N/A
Hill	No	N/A	Sweet Grass	Yes	N/A
Gallatin	No	N/A	Teton	Yes	N/A
Lake	Yes	No	Yellowstone	Yes	N/A

Japanese Beetle
Popillia japonica

Japanese beetle is a pest of turf grass, a large number of ornamental plants including roses, and has the potential to be a pest of several important crop plants, including corn and soybeans. It is widespread in the eastern United States, but is either absent, or occurs in small, sporadic populations in most western states. Montana is a Category 1, Protected State, with no known established populations of the beetle. To maintain this status, which enhances exports for the state's nursery industry, the Montana Department of Agriculture and the USDA APHIS PPQ have trapped at major airports and nurseries that obtain stock from out of state for the past decade.

The surveillance consists of standard Japanese beetle traps, with plastic bottoms. Each trap is baited with both a floral and pheromone lure. The lures are replaced twice during the course of the summer. The traps in all areas except Billings are checked on a monthly basis. Additional information about the Billings delimitation grid is included in this report. Due to repeated detections in the Billings area, a delimitation grid has been placed in that city for the past 3 years. All detections thus far have been in an area just south of the Billings airport.

Statewide there were 393 JB traps placed. Of these, 260 were initially placed in Billings, with an additional 70 placed as a result of positive catches. Seven soil samples were taken in the area surrounding the first detections.

In Billings, a modified delimitation grid containing 260 traps was established for the 2005 season. The traps were placed during the week of June 21, 2005 and removed in late September. The traps are located in 1-mile square grids, with the majority of the traps located in the area where beetles have been collected in the past. Traps in the grids with the highest number of detections in the past were checked weekly, surrounding grids were checked on a two-week basis, and perimeter grids were checked at least once each month. The location of each trap site was determined using a GPS device, and the data was later used to create maps.

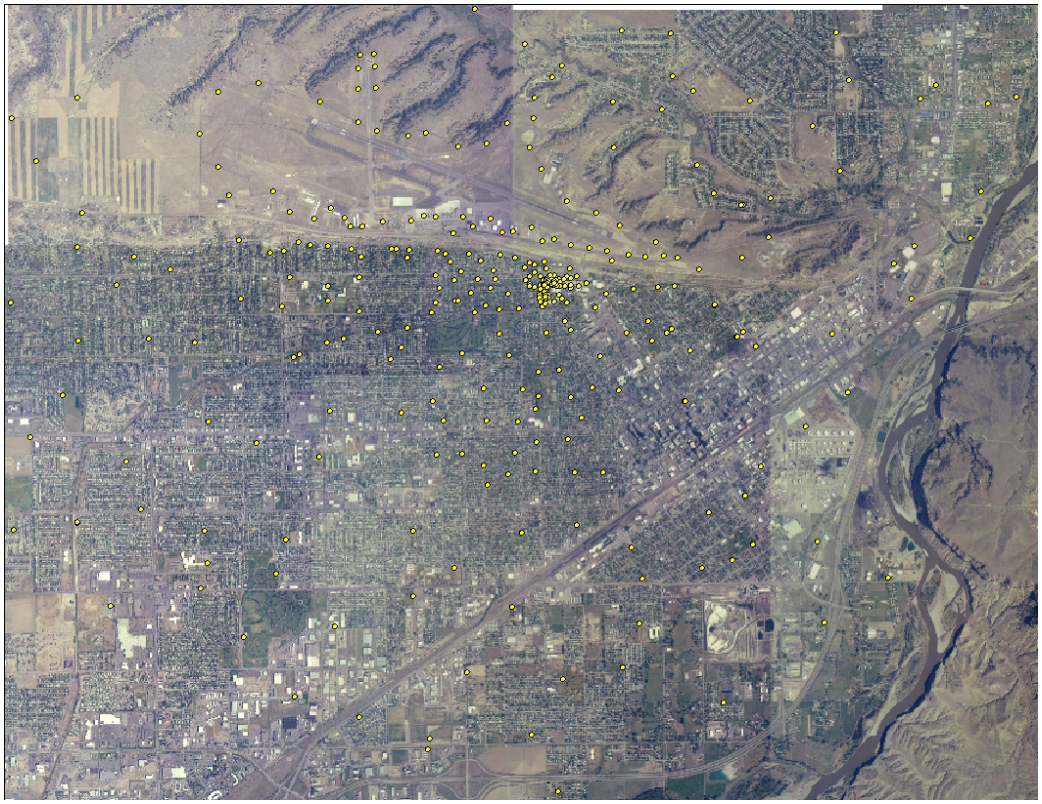
The first beetle detected in a pheromone trap was collected on July 28, 2005. Subsequently, additional traps were placed in the immediate area of the positive trap. Additional beetles were

collected. Each time a beetle was found in a trap that had not previously been a positive collection site, 5 additional traps, located about 50 yards away, were placed around it. By the end of August, 70 additional traps had been placed. A total of 40 beetles were collected, primarily from a single trap. This probably reflects survival of the progeny of a single mated female that oviposited in the summer of 2004.

Soil samples were taken from an extensive lawn area immediately surrounding the first positive traps. No JB larvae were detected.

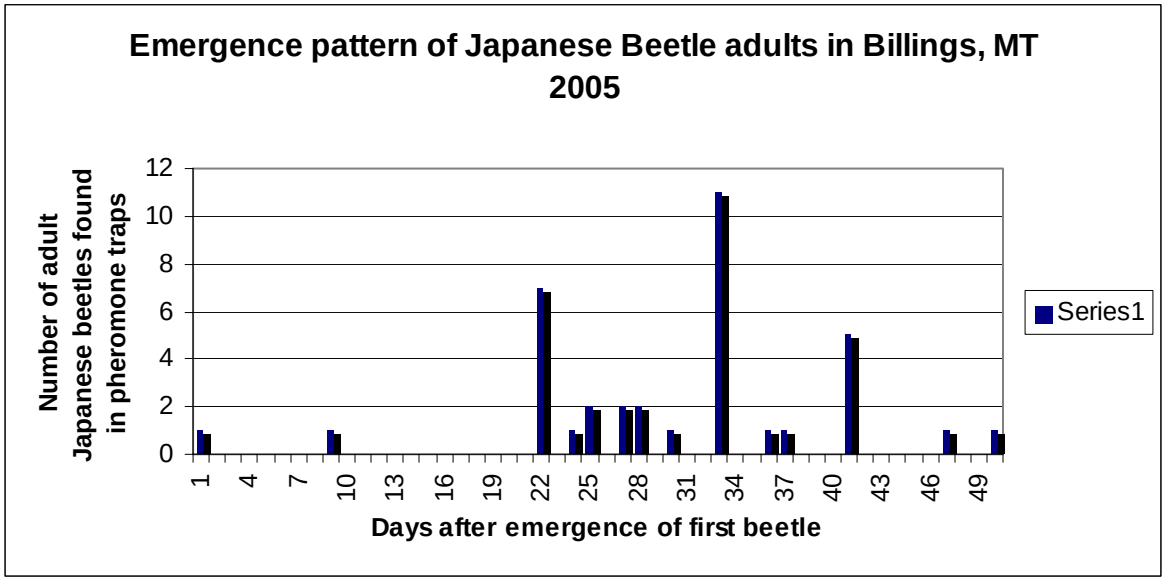
An eradication plan encompassing one mile in diameter was targeted for treatment. Of this area, about 1/3 of the property is owned by Montana State University, and 1/3 is desert shrub land or rock. The remaining area is residential. Eradication efforts began in the fall of 2005, with treatment of all MSU-Billings grounds.

Modified delimitation grid for the summer of 2005. Areas are one square mile, and numbers represent the number of traps for that area.



Yellow dots represent actual distribution of Japanese beetle traps in Billings, MT.

Positive traps are yellow. All positive traps are within the grid targeted for 50 traps. The trap marked with a large yellow dot contained the highest cumulative number of JB.

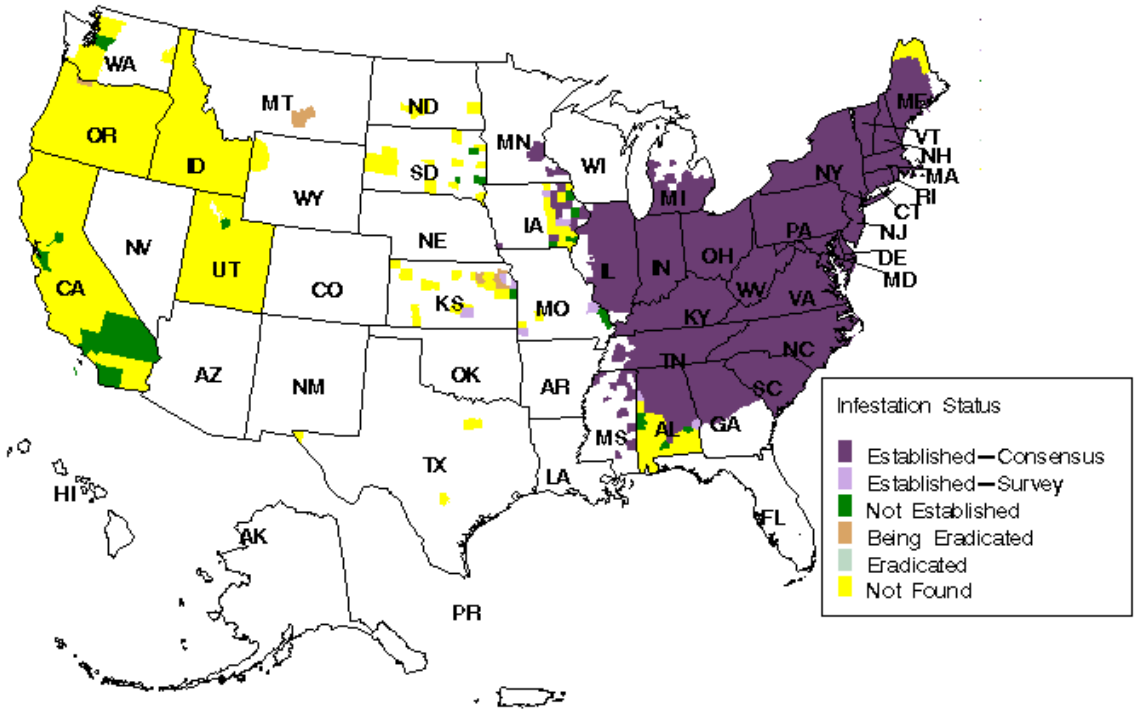


Reported Status of

JAPANESE BEETLE (JB) , POPILLIA JAPONICA

in US and Puerto Rico (01/01/2005–11/14/2005)

Data retrieved from National Agricultural Pest Information System on 11/14/2005



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Tree Fruit Pest Survey

Although Montana is not generally thought of as a tree fruit producing state, there is a small, but thriving tree fruit industry on the western side of the state, primarily in the Bitterroot Valley and around Flathead Lake. The primary product in the Flathead Lake area is sweet cherries. In the Bitterroot Valley growers produce mainly sour cherries and apples. During 2004, the last year for which information is available 2,360 tons of sweet cherries were produced in Montana, with a total value of about $4.4 million. Apple production is lower, and generally for a more localized market. However, there are orchards with several acres of trees located in both production areas. Both areas are plagued by a large number of feral trees, homeowner trees that are not well managed, trees kept for strictly ornamental purposes, and native host material. As a result, insect problems do exist.

In 2005, the Flathead Cherry Growers created a Pest Management District for the Western Cherry Fruit Fly (WCFF) (*Rhagoletis indifferens* Curran). However, lack of information about other insect pests poses a challenge to all fruit growers in the state. Therefore, the Montana Department of Agriculture conducted a survey, through the CAPS program, to investigate the presence or absence of seven potential pest insects in the main fruit production areas: Flathead, Lake, Sanders, Ravalli, and Missoula Counties. The cherry insects surveyed for were European cherry fruit fly (ECFF) (*Rhagoletis cerasi* Loew), plum fruit moth (PFM) [*Cydia funebrana* (Treistschke) (also *Grapholita funebrana* Treistschke)], cherry ermine moth (CEM) (*Yponomeuta padellus* L), and cherry bark tortrix (CBT) (*Enarmonia formosana* Scopoli). The apple pests surveyed for were apple ermine moth (AEM) (*Yponomeuta malinellus* Zeller), apple tortrix (AF) (*Archips fuscocupreanus* Wlsm), and dark fruit tree Tortrix (PH) (*Pandemis heparana* Denis & Schiffermuller).

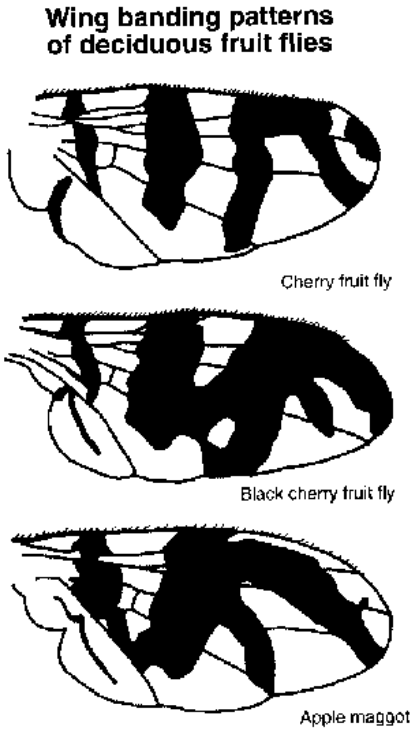
With the exception of the ECFF survey, which used 5” X 9” yellow sticky cards with food attractant, all surveys used Pherocon IIC wing traps with the appropriate pheromones, supplied by USDA APHIS PPQ.

Pests of Cherries

The survey did not detect any ECFF. However, there were numerous WCFF collected on the cards, as well as a very small number of apple maggots [*Rhagoletis pomonella* (Walsh)]. While apple maggot is similar to snowberry fruit fly (*Rhagoletis zephyria* Snow), there are enough differences to indicate that this insect is not the same species. Three moths were also included in the survey: Plum fruit moth (PFM), cherry ermine moth (CEM), and cherry bark tortrix (CBT). There were no detections of any of these moths.

Pests of Apples

A large number of moths were collected on the PH traps, and a smaller number on the AF traps. A select group of these traps were sent to Eric LaGasa at the Washington State Department of Agriculture for confirmatory identification. They were identified as a close relative of PH, *Pandemis pyrusana* Kearfott, and another similar moth *Clepsis virescana* (Clemens). There were no PH, AF or AEM collected.



Michigan State University Extension Publication
http://web1.msue.msu.edu/vanburen/fappmag.htm

Yponomeuta malinellus Zeller 1838

(Yponomeutidae Yponomeutinae)

Apple Ermine Moth

Eric H. LaGasa (360) 902-2063 Plant Prot. Div. WA State Dept. of Agriculture elagasa@agr.wa.gov

Enarmonia formosana Scopoli 1763

(Tortricidae Olethreutinae) Cherry Bark Tortrix

Eric H. LaGasa (360) 902-2063 Plant Prot. Div. WA State Dept. of Agriculture elagasa@agr.wa.gov

Archips fuscocupreanus-Walsingham 1900

(Tortricidae Tortricinae) Apple Tortrix

Eric H. LaGasa (360) 902-2063 Plant Prot. Div. WA State Dept. of Agriculture elagasa@agr.wa.gov

Pandemis heparana
Denis & Schiffermuller 1775
(Tortricidae Tortricinae) Dark Fruit Tree Tortrix





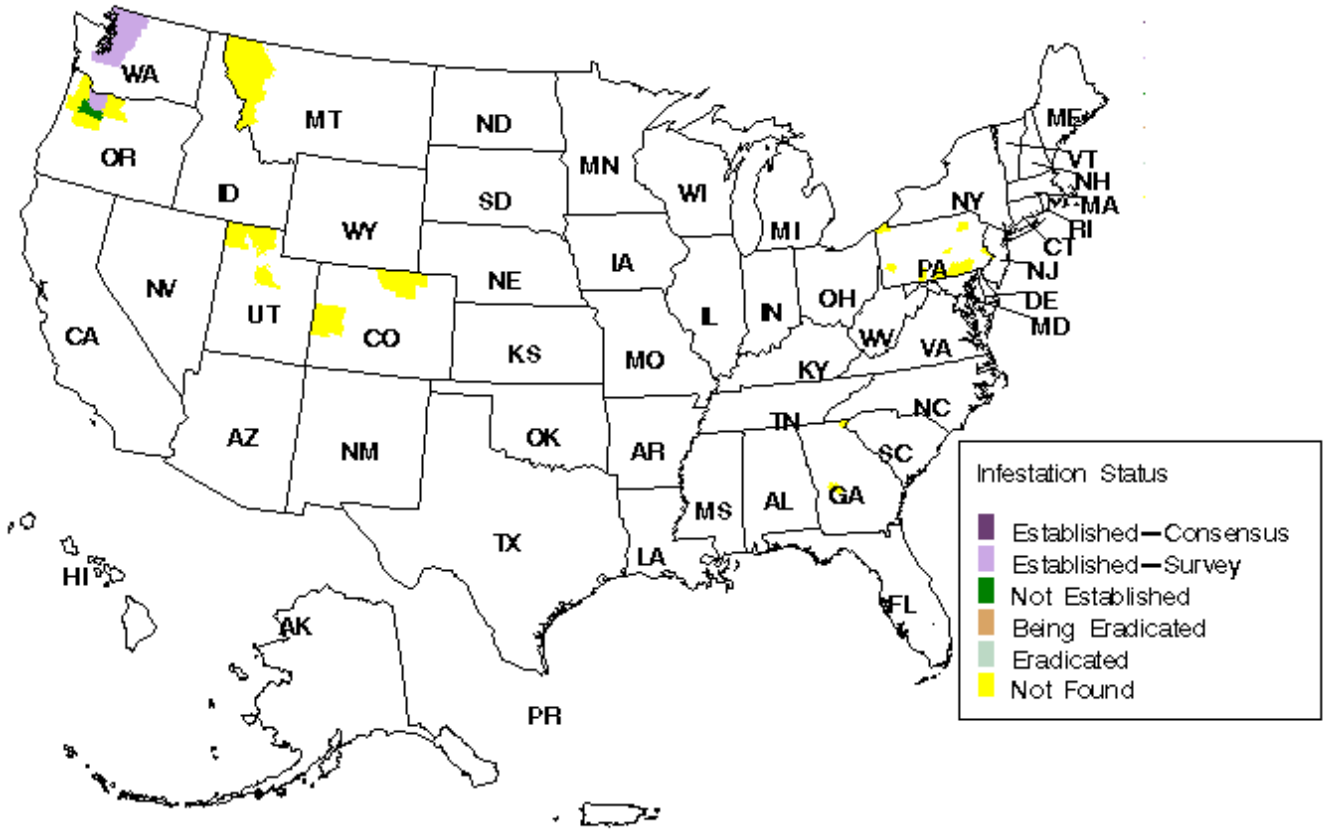

Eric H. LaGasa (360) 902-2063 Plant Prot. Div. WA State Dept. of Agriculture elagasa@agr.wa.gov

Reported Status of

CHERRY BARK TORTRIX (CBT) , ENARMONIA FORMOSANA

in US and Puerto Rico

Data retrieved from National Agricultural Pest Information System on 09/08/2006



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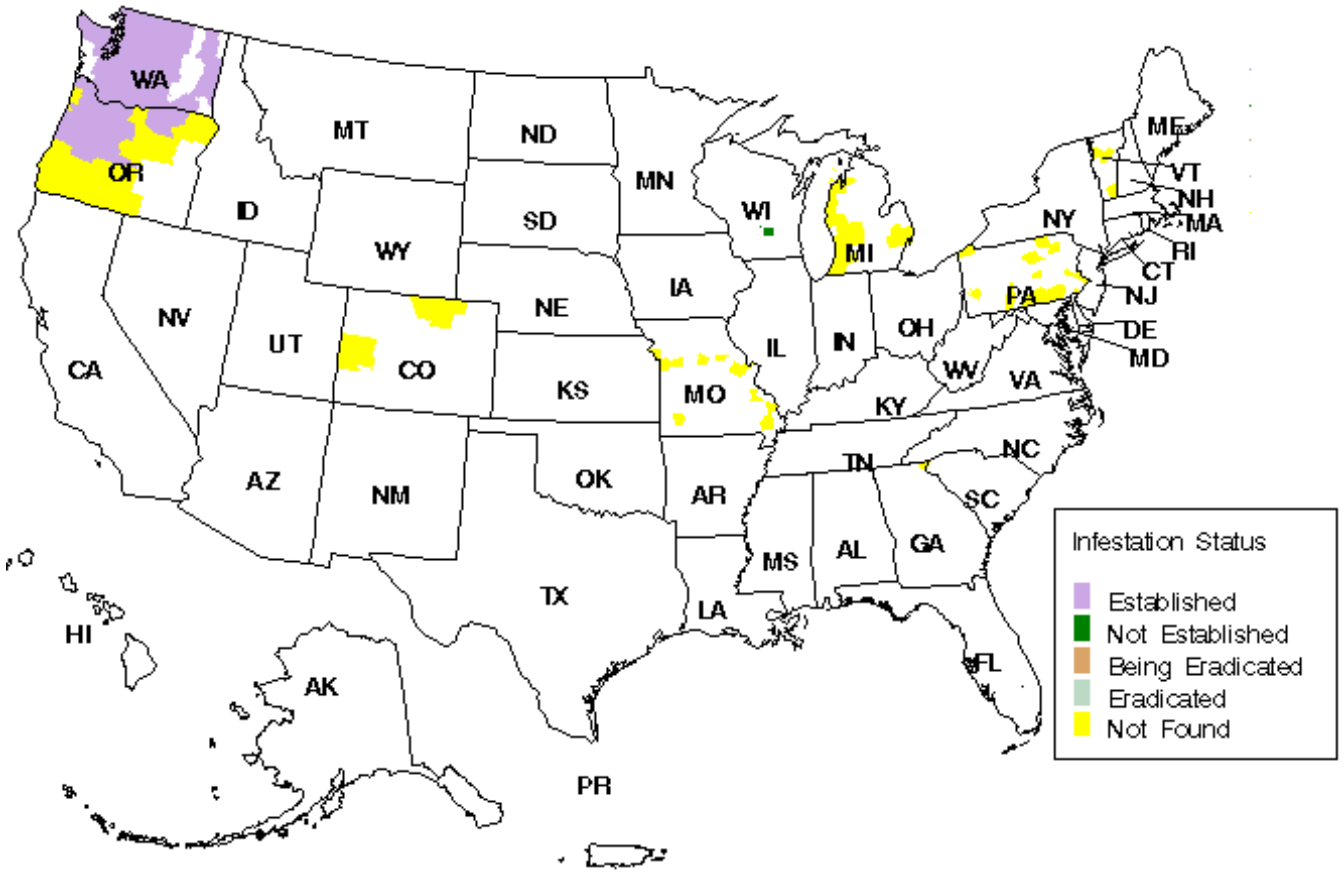
Reported Status of

APPLE ERMINE MOTH (AEM) , YPONOMEUTA MALINELLUS

in US and Puerto Rico

Data retrieved from National Agricultural Pest Information System on 01/06/2006



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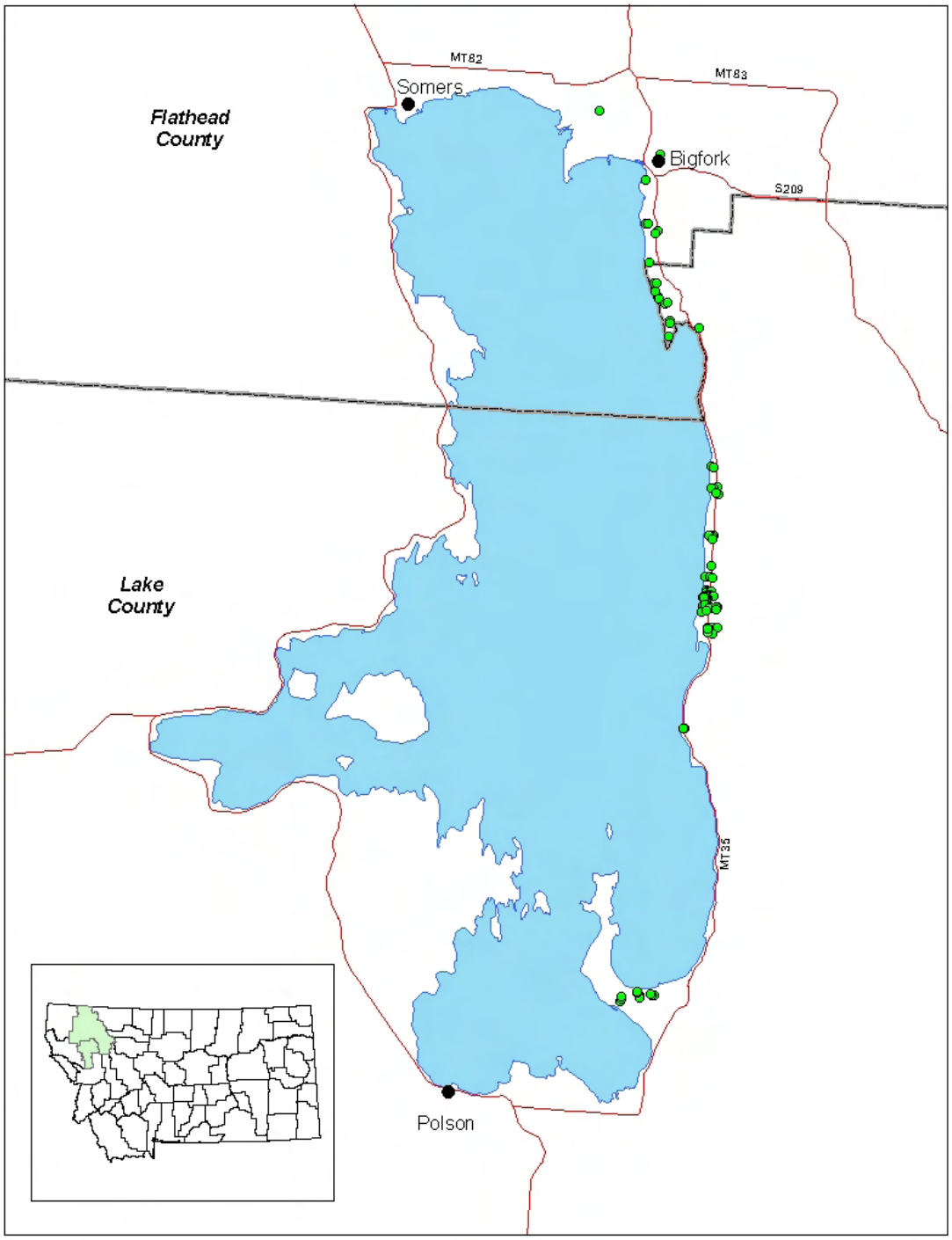
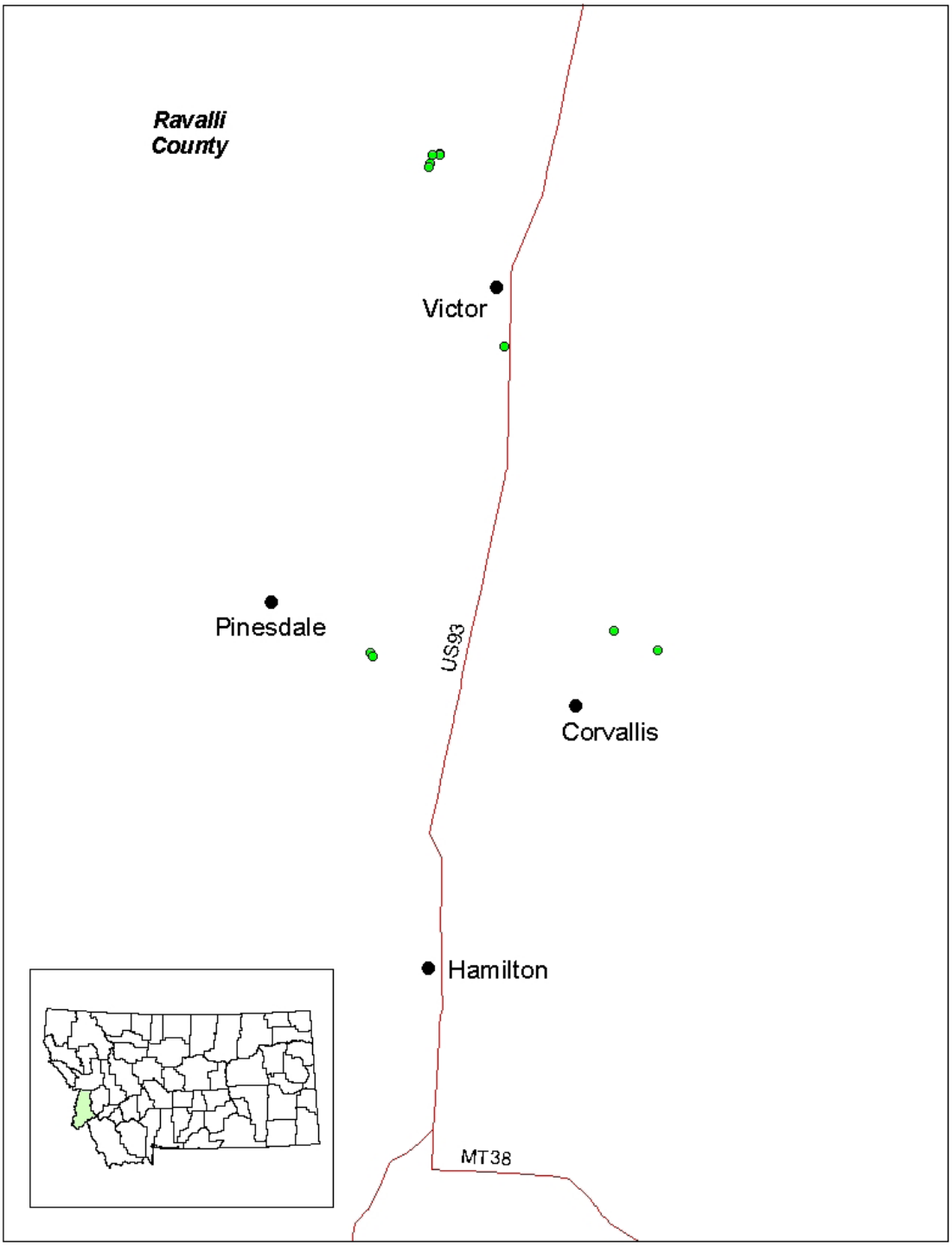
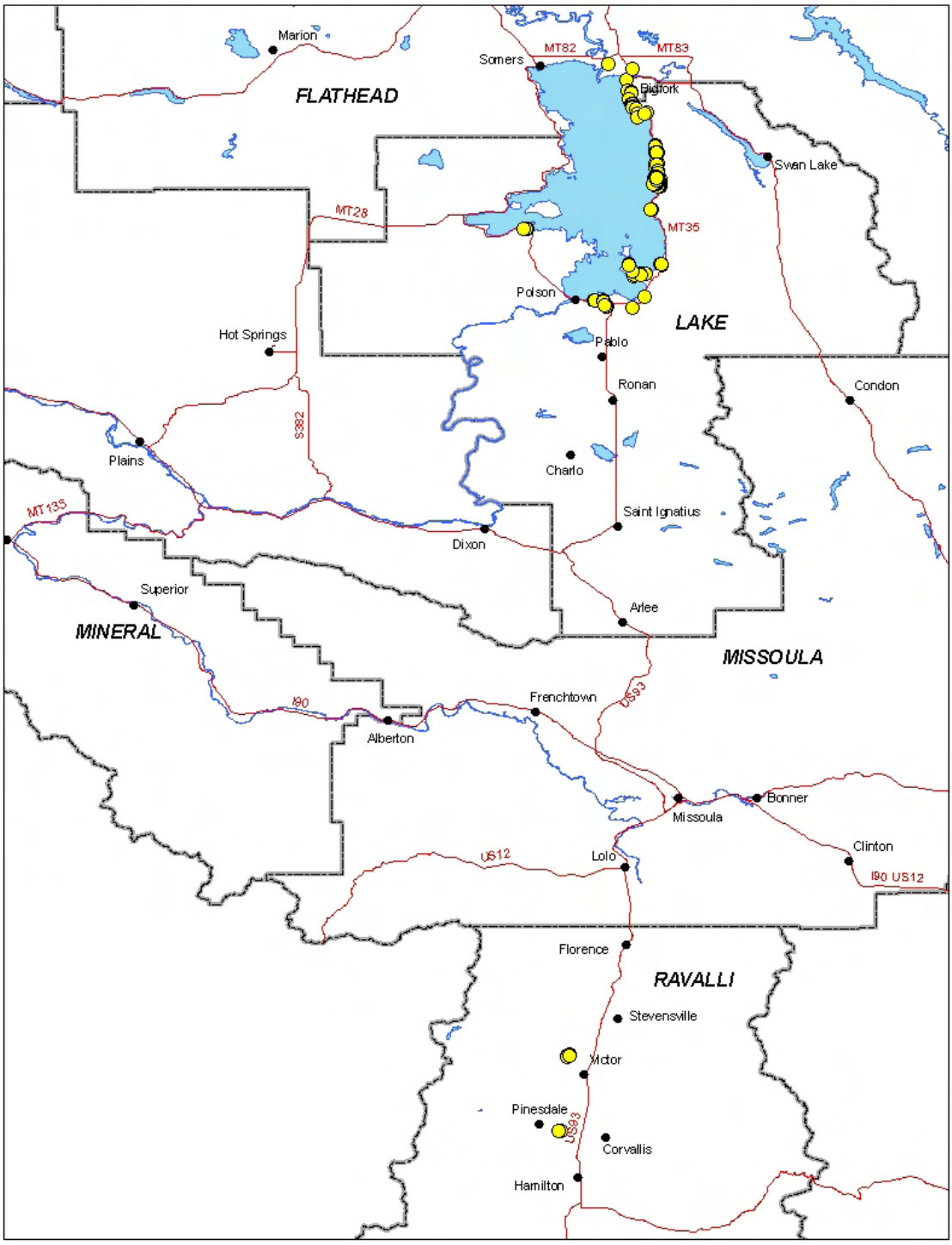


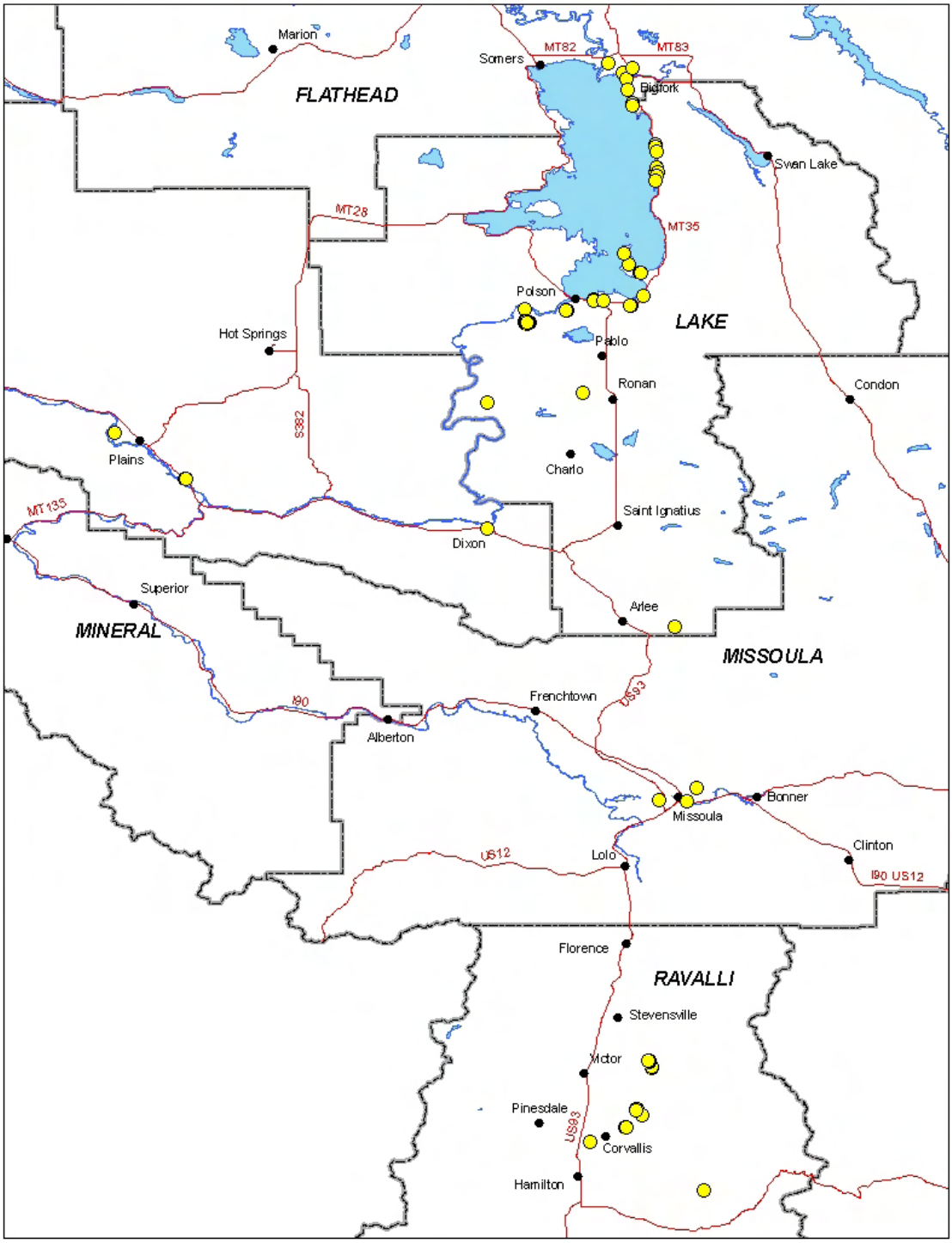
Location of European cherry fruit fly traps in the northern portion of the trapped area: Flathead and Lake Counties, MT.



Location of European cherry fruit fly traps in the southern portion of the trapped area: Ravalli County, MT.



Location of cherry pest traps (moths) in the western Montana area during 2005 survey.



Location of apple pest traps (moths) in the western Montana area during 2005 survey.

Gypsy Moth
Lymantria dispar (L)

Gypsy moth (*Lymantria dispar* (L)) was initially introduced into the eastern U. S. as a potential source of silk. However, the silk produced by the larvae is substantially inferior to silkworm silk. In the process of this discovery, some of the insects escaped, rapidly becoming established as a defoliating pest of numerous trees. The females oviposit on various surfaces, hiding the eggs under a covering of hairs or scales. One of the most common ways for this insect to move to new areas is through the movement of egg masses on inanimate objects, such as vehicles, lawn furniture, and nursery materials. As a result, the insect can move rapidly throughout the country.

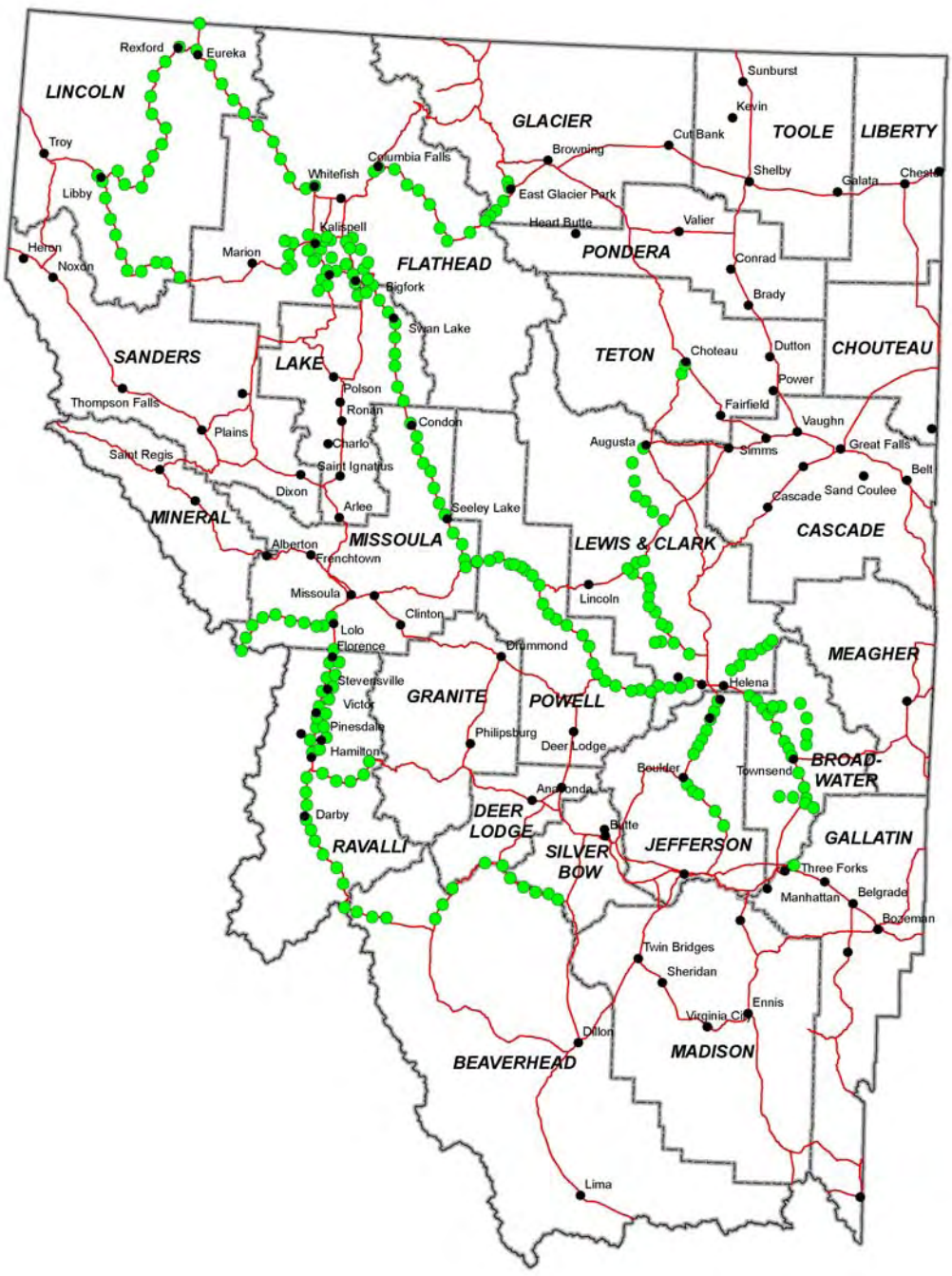
In Montana, responsibility for the trapping of gypsy moth is a multi-agency cooperative effort between the USDA APHIS PPQ, The Montana Department of Agriculture (MDA), The Montana Department of Natural Resources and Conservation (DNRC), and the USDA Forest Service. The USDA APHIS PPQ is responsible for trapping in mainly the eastern portion of the state, while MDA traps mainly in the western part of the state, DNRC traps in Mineral and Missoula County, and USDA Forest Service traps in a large number of Forest Service campgrounds, as well as other public areas.

All four agencies use delta traps with disparlure, although the trap color does vary with agency. All traps were placed by early June, and checked throughout the summer at two to three week intervals.

There were no detections of gypsy moth in Montana during 2005.

2005 Gypsy Moth Trapping Results for Montana

County	Number of traps placed by each agency				Total Traps	Positive Detections
	MDA	DNRC	USDA FS	USDA APHIS PPQ		
Beaverhead	8	0	12	39	59	0
Big Horn	0	0	4	0	4	0
Blaine	0	0	0	14	14	0
Broadwater	21	0	2	9	32	0
Carbon	0	0	24	0	24	0
Carter	0	0	2	0	2	0
Cascade	0	0	4	52	56	0
Chouteau	0	0	2	2	4	0
Custer	0	0	0	4	4	0
Daniels	0	0	0	1	1	0
Dawson	0	0	0	4	4	0
Deer Lodge	0	0	2	14	16	0
Fergus	0	0	6	0	6	0
Flathead	44	0	28	0	72	0
Gallatin	1	0	20	50	71	0
Garfield	0	0	0	1	1	0
Glacier	6	0	25	26	57	0
Granite	0	0	22	6	28	0
Hill	0	0	0	5	5	0
Jefferson	12	0	0	32	44	0
Judith Basin	0	0	2	0	2	0
Lake	11	0	10		21	0
Lewis & Clark	32	0	8	19	59	0
Lincoln	29	0	20	0	49	0
Madison	0	0	10	46	56	0
McCone	0	0	0	3	3	0
Meagher	0	0	4	0	4	0
Mineral	0	0	6	0	6	0
Missoula	23	38	24	0	85	0
Park	0	0	22	0	22	0
Phillips	0	0	8	15	23	0
Pondera	0	0		4	4	0
Powder River	0	0	2	0	2	0
Powell	20	0	4	4	28	0
Ravalli	31	0	6	0	37	0
Richland	0	0	0	2	2	0
Roosevelt	0	0	0	7	7	0
Rosebud	0	0	6	0	6	0
Sanders	0	0	6	0	6	0
Sheridan	0	0	0	1	1	0
Silver Bow	5	0	4	36	45	0
Sweetgrass	0	0	6	0	6	0
Teton	2	0	0	18	20	0
Valley	0	0	0	20	20	0
Yellowstone	0	0	0	35	35	0
Yellowstone National Park	0	0	0	10	10	0
Total	245	38	301	479	1063	0



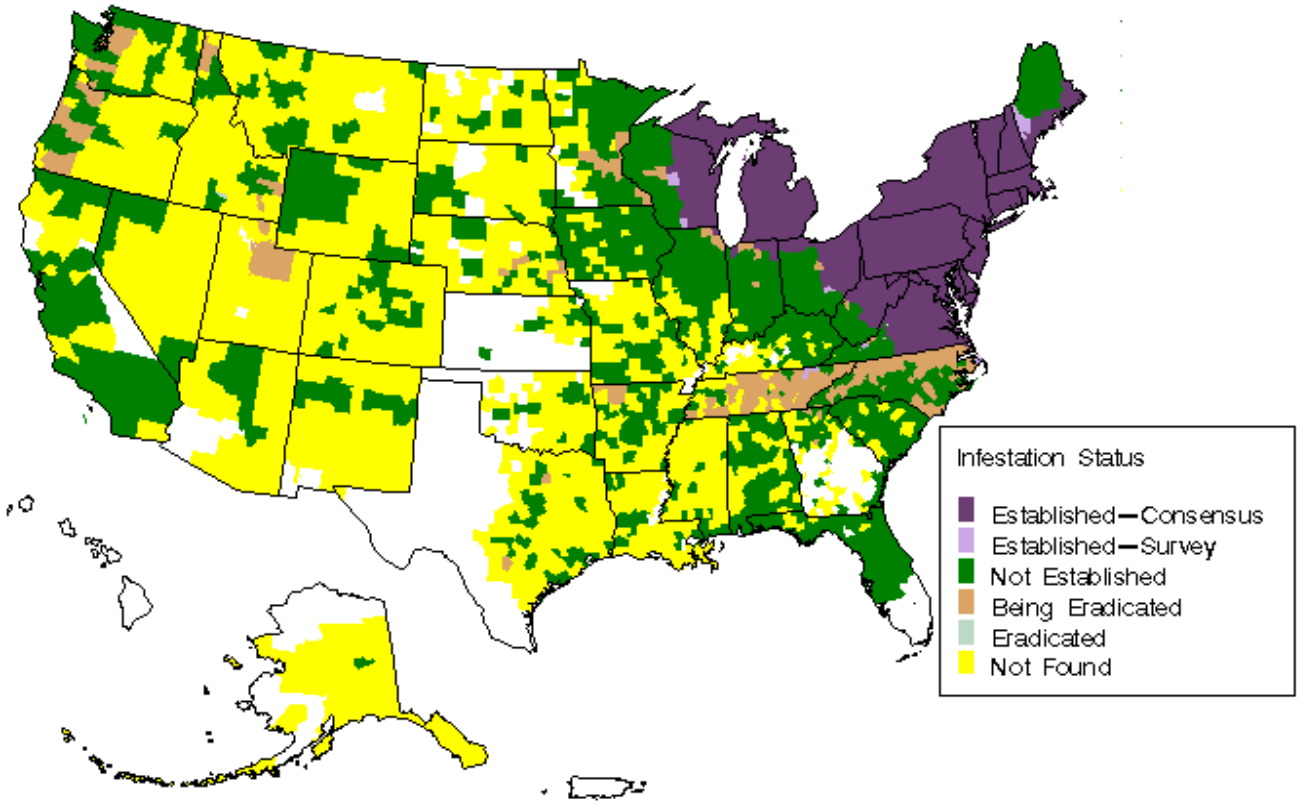
Locations of gypsy moth traps placed by the Montana Department of Agriculture in 2005

Reported Status of

GYPSY MOTH (EUROPEAN)(GM) , LYMANTRIA DISPAR

in US and Puerto Rico

Data retrieved from National Agricultural Pest Information System on 03/02/2006



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Sudden Oak Death
Phytophthora ramorum

Phytophthora ramorum, also known as Sudden Oak Death, is dispersed both through wind and through the soil. This disease affects certain oak species, resulting in bleeding cankers and other symptoms such as shoot tip dieback on affected hosts. Thousands of trees throughout California and Oregon have been lost. As of November 10, 2005, there are 38 proven host plants that carry and transmit *Phytophthora ramorum*, and 48 associated hosts. The list continues to expand, as more samples are collected and found to be positive for the disease.

The wide range of host plants includes, rhododendron, camellia, Douglas fir, viburnum, and lilacs, including other hardwood species and herbaceous plants. Effects of the disease can vary from leaf spots to complete mortality of some plants. This disease is capable of rapid disease spread, as increasing numbers of ornamental plants are shipped both nationally and internationally.

During the 2005 National Survey for Sudden Oak Death, three nurseries tested positive in Louisiana. A nursery in Tennessee was also confirmed with two positive *Phytophthora ramorum* samples while surveying for the disease.

The Montana Department of Agriculture surveyed nurseries and retail outlets throughout twelve counties. Over 430 samples were collected and tested for *Phytophthora ramorum.* All of the results were negative for the detection of the pathogen.

Often the disease is difficult to detect, therefore an accurate diagnosis requires testing of any suspicious plant material that appears to be infected.

Positive Rhododendron leaf. Other signs and symptoms may vary from plant to plant.
O'Brien, Joseph USDA Forest Service http://www.forestryimages.com

Phytophthora ramorum has been detected on these hosts

Coast Live Oak & CA Black Oak

Bay Laurel

Sample leaves

Rhododendron

Sample leaves

Toyon

Sample leaves

Buckeye

Sample leaves

Maple

Sample leaves

Madrone

Sample leaves

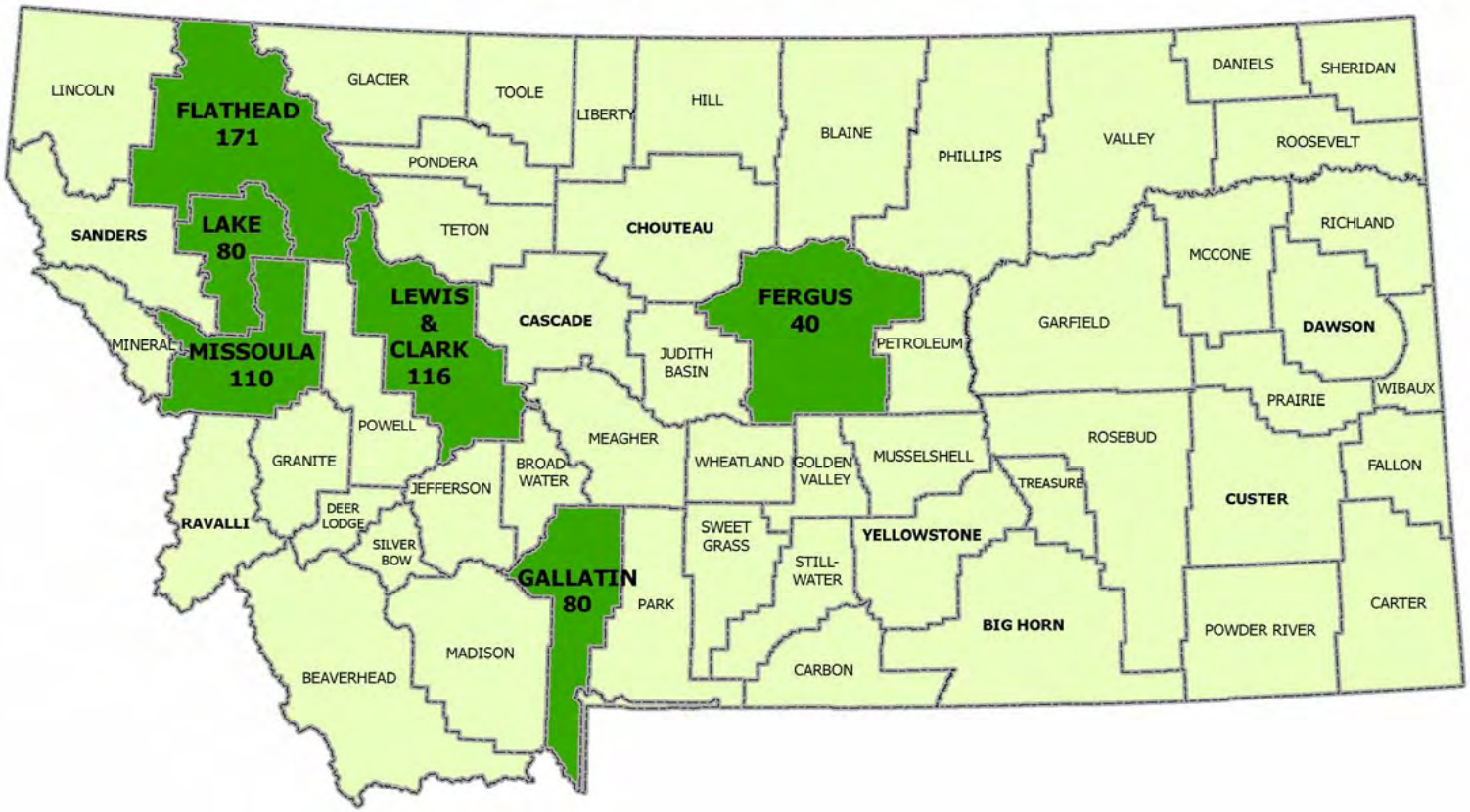
Tanoak

Sample leaves

Manzanita

Sample dead branch- on the border between the dead and the live areas.

Sudden Oak Death Samples Per County - 2005

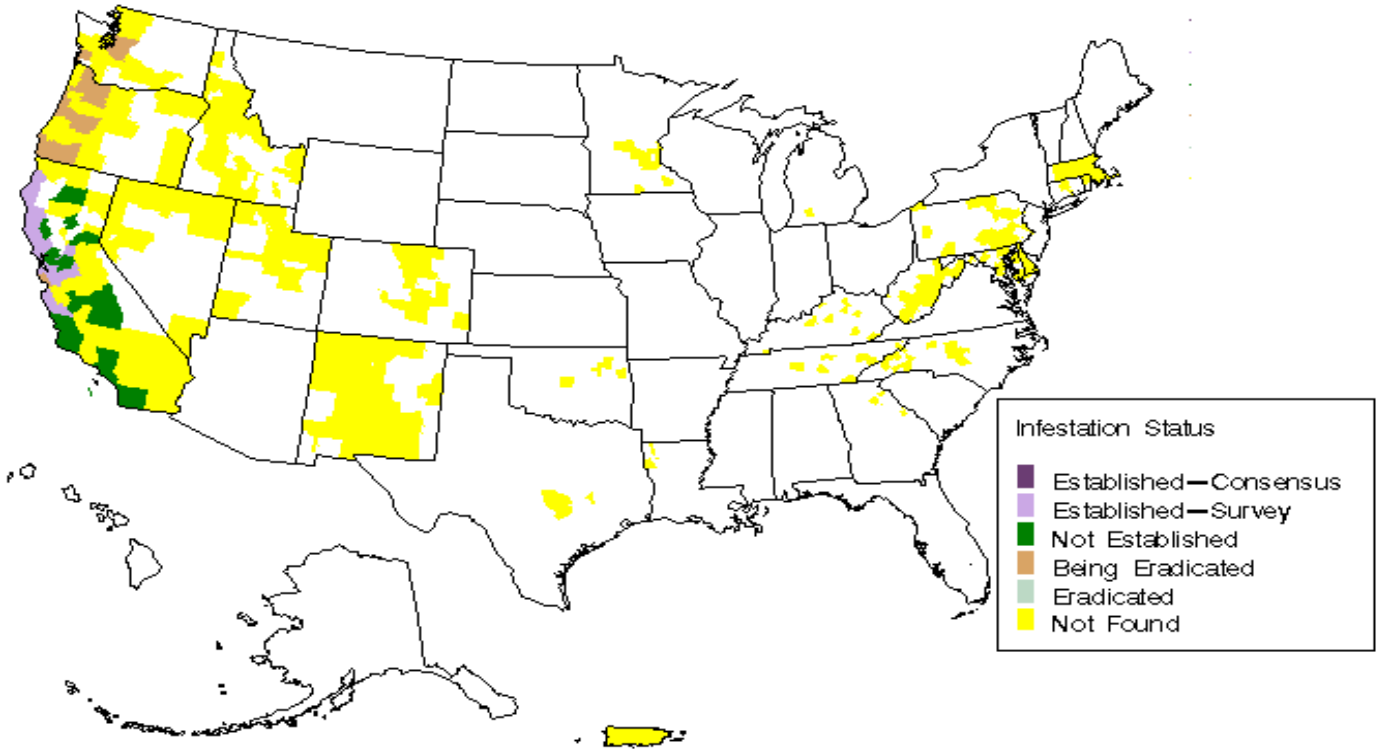


Reported Status of

SUDDEN OAK DEATH MATING TYPE 2 , PHYTOPHTHORA RAMORUM

in US and Puerto Rico

Data retrieved from National Agricultural Pest Information System on 02/14/2006



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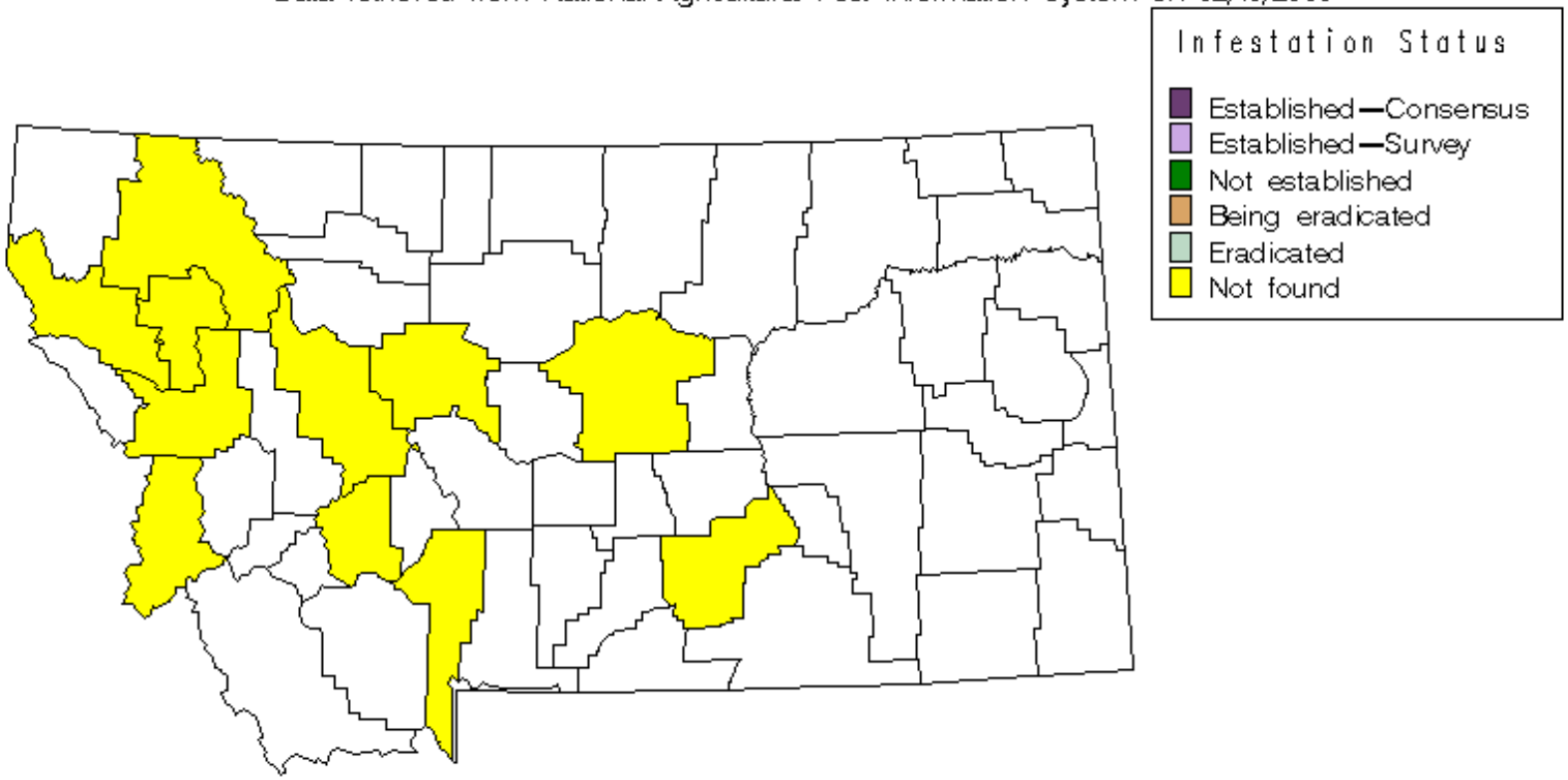
Sudden Oak Death

SUDDEN OAK DEATH , PHYTOPHTHORA RAMORUM

in MONTANA

Data retrieved from National Agricultural Pest Information System on 02/15/2006



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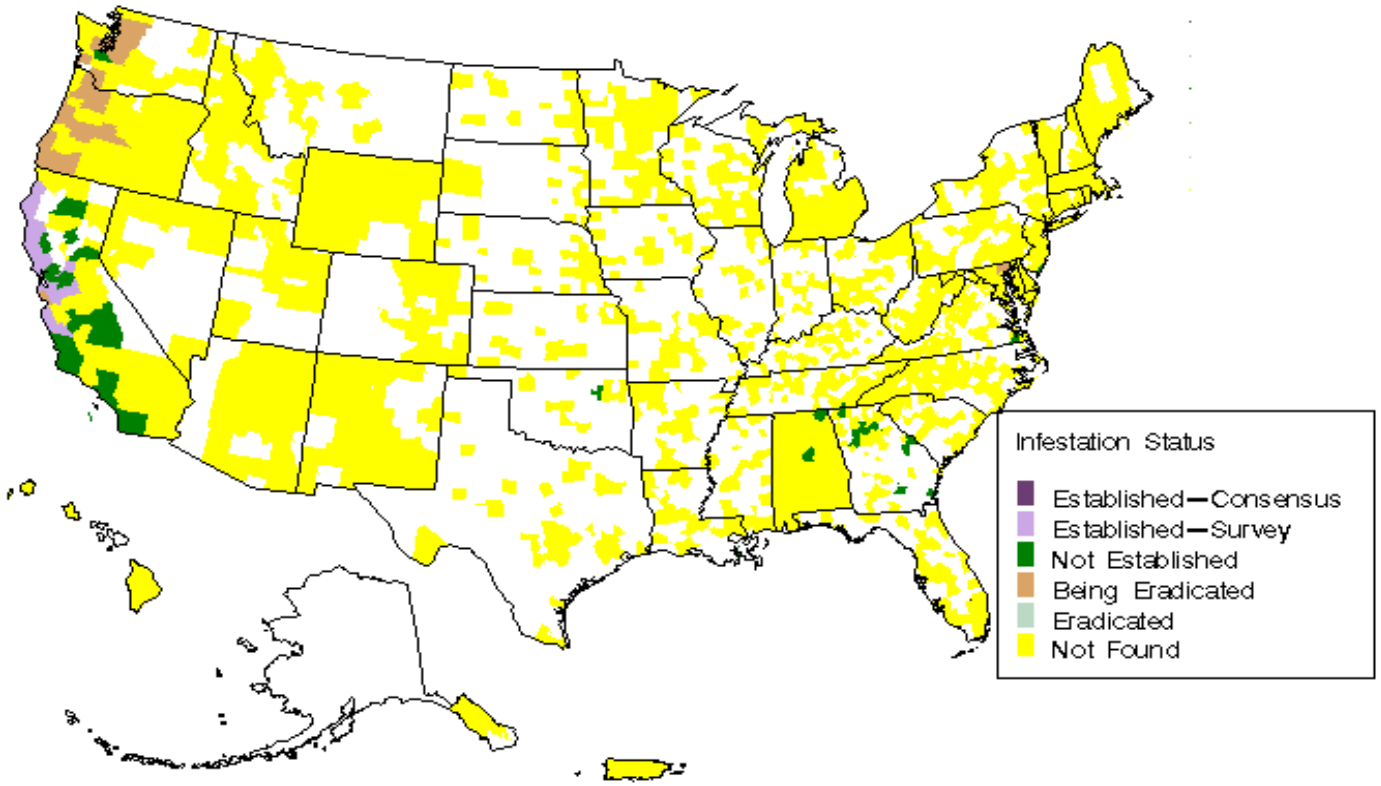
Sudden Oak Death

SUDDEN OAK DEATH , PHYTOPHTHORA RAMORUM

in US and Puerto Rico

Data retrieved from National Agricultural Pest Information System on 02/15/2006



The Center for Environmental and Regulatory Information Systems does not certify the accuracy or completeness of the map. Negative data spans over last 3 years only.

Daylily Rust
Puccinia hemerocallidis

Daylily rust is a fungus, which primarily affects numerous varieties of Hemerocallis. Daylily rust requires two distinct host plants in order to complete its life cycle. Alternate hosts of daylily rust are Patrinia species and potentially Hosta species.

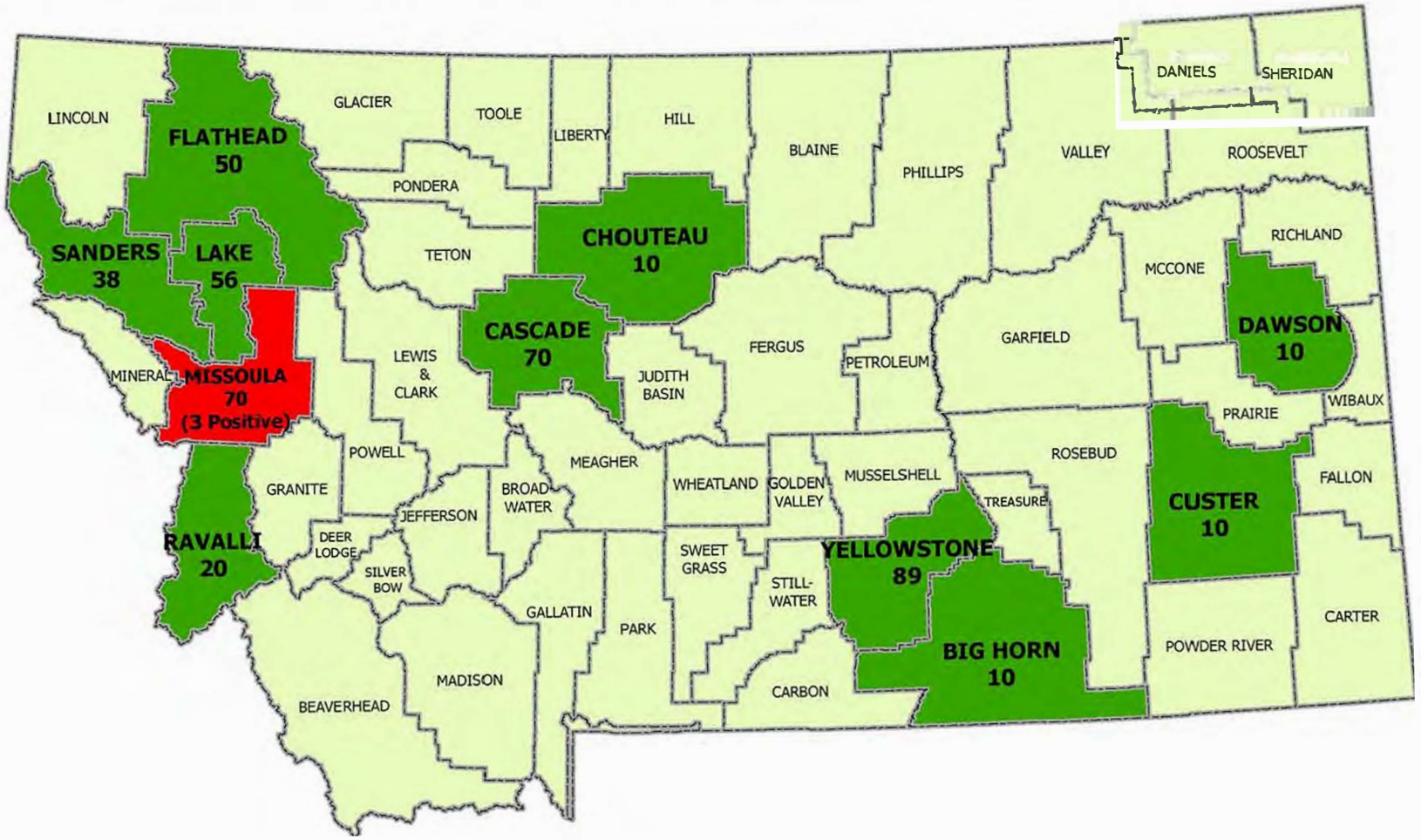
There are six known Patrinia species in the United States. The pathogen was discovered in 1880, and is native to Asia. It is generally found in China, Japan, Korea, Taiwan and Russia.

The first confirmation of daylily rust in the United States was found the summer of 2000. In the fall of 2001, Puccinia hemerocallidis was discovered throughout 30 states, due to the natural spread of spores.

The rust is an airborne pathogen spread by wind, irrigation methods, rain, and also by human movement of the plants. Daylily Rust is spread very rapidly, and development of the rust takes only between 2-3 days after inoculation with the spores to cause rusty colored lesions. Subsequent spore release causes further distribution of the pathogen. Symptoms of infection are observed when yellow to brown colored leaves appear with streaks and spotting, which begins to spread until the entire leaf appears brown in color. On the underside of the leaves, during sporulation, several small yellow-orange pustules will develop, which are dusty to the touch.

This is the first year Nevada has discovered the presence of daylily rust. Maine also found daylily rust within their state. Both states are working to eradicate the rust, to prevent its spread. The Montana Department of Agriculture collected a total of 435 samples at nurseries and retail garden centers. All daylily samples were shipped to the Montana State University Plant Pathology Lab for analysis. Test results confirmed the presence of daylily rust on three samples in Missoula County. All other submitted samples that were tested for the pathogen came back negative.

Daylily Rust Samples Per County - 2005

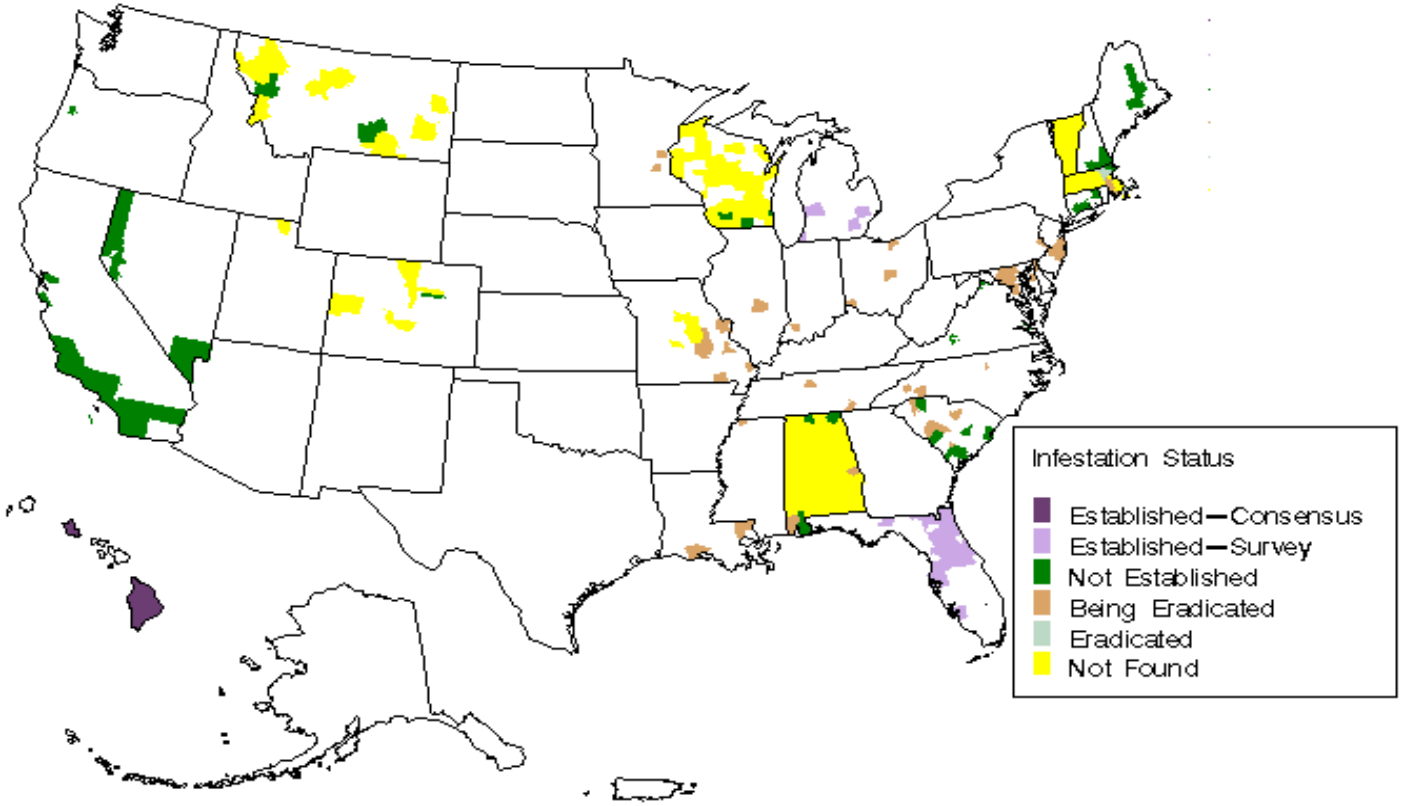


Reported Status of

DAYLILY RUST , PUCCINIA HEMEROCALLIDIS

in US and Puerto Rico

Data retrieved from National Agricultural Pest Information System on 02/15/2006



The Center for Environmental and Regulatory Information Systems does not certify the accuracy or completeness of the map. Negative data spans over last 3 years only.

Karnal Bunt
Tilletia indica

Karnal bunt (KB) is a fungal disease that affects wheat, durum wheat and triticale. Initially, the disease was discovered near Karnal, India in 1931. It was first detected in the United States in 1996, within the State of Arizona. KB thrives in cool, moist temperatures as the wheat is starting to head out.

Fungal spores are windborne and can be spread easily through the soil. Uncontaminated grain can also become infested after passing through or being transported by contaminated equipment. Spores have the ability to survive within the soil for several years, given favorable conditions. Controlling the transportation of contaminated seed is essential to prevent KB from spreading to major grain production areas.

I

Montana ranked third in all wheat production in 2004, accounting for 8.0 percent of the U.S. wheat production, surpassed only by Kansas and North Dakota. Although North Dakota outpaced Montana in durum wheat production, Montana still produced 20.0 percent of the nation's durum wheat, ranking second among states in durum wheat production. Montana ranked third in other spring wheat production.

Bunted Wheat

Credits: R. Duran, Washington State University www.forestryimages.org

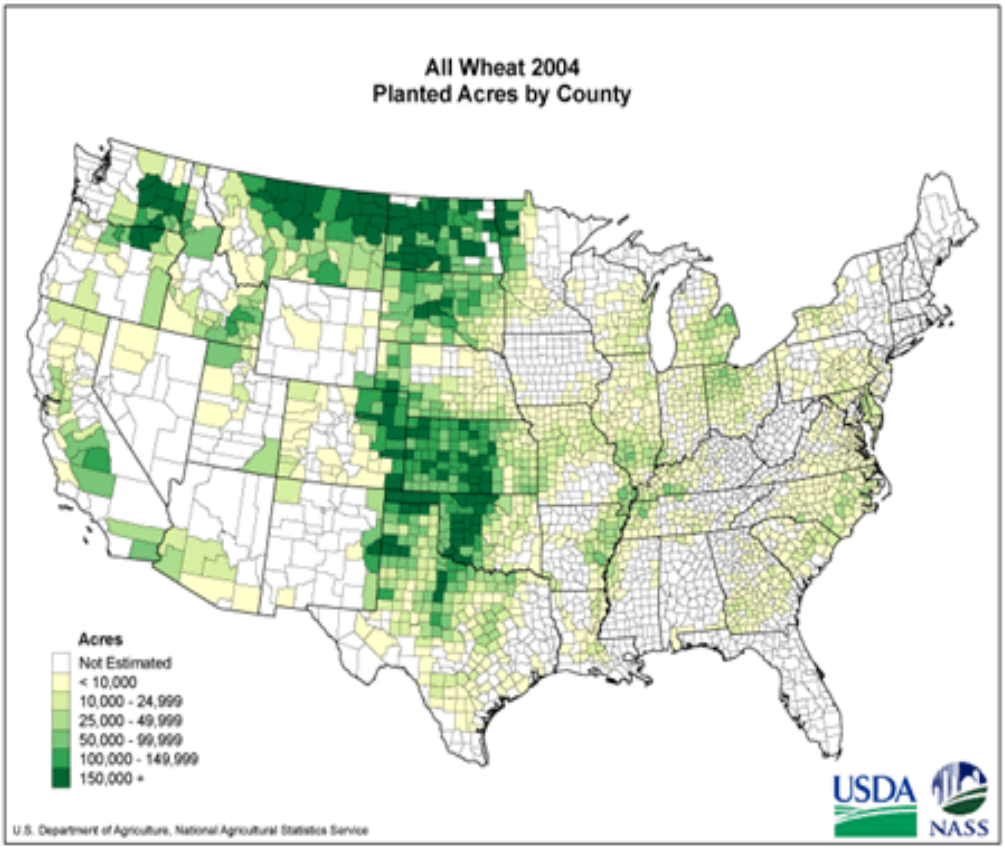
Montana's Rank in the Nation's Wheat Production

ITEM	UNIT		PERIOD OR DATE	RANK	% U.S. Total
CROP PRODUCTION					
All Wheat	173,165,000	bushels	2004	3	8.0
Winter Wheat	66,830,000	bushels	2004	5	4.5
Durum Wheat	17,985,000	bushels	2004	2	20.0
Other Spring Wheat	88,350,000	bushels	2004	3	15.5
Barley	48,970,000	bushels	2004	3	17.5

www.nass.usda.gov/mt/pressrls/misc/mtrank.htm

Montana continued to sample for Karnal Bunt during the 2005 harvest season. A total of 119 samples were collected in 31 counties throughout Montana. The USDA Laboratory in Olney, Texas conducted the testing. All samples tested negative for the presence of Karnal bunt. This sampling is critical for wheat growers in Montana. It confirms our wheat is free from KB, ensuring access to export markets.

Wheat All Value of production for 2005		
State Rank	**State**	**Value of production**
1	Kansas	1,254,000 thousand dollars
2	North Dakota	1,074,981 thousand dollars
3	Montana	696,537 thousand dollars
4	South Dakota	480,861 thousand dollars
5	Washington	476,005 thousand dollars

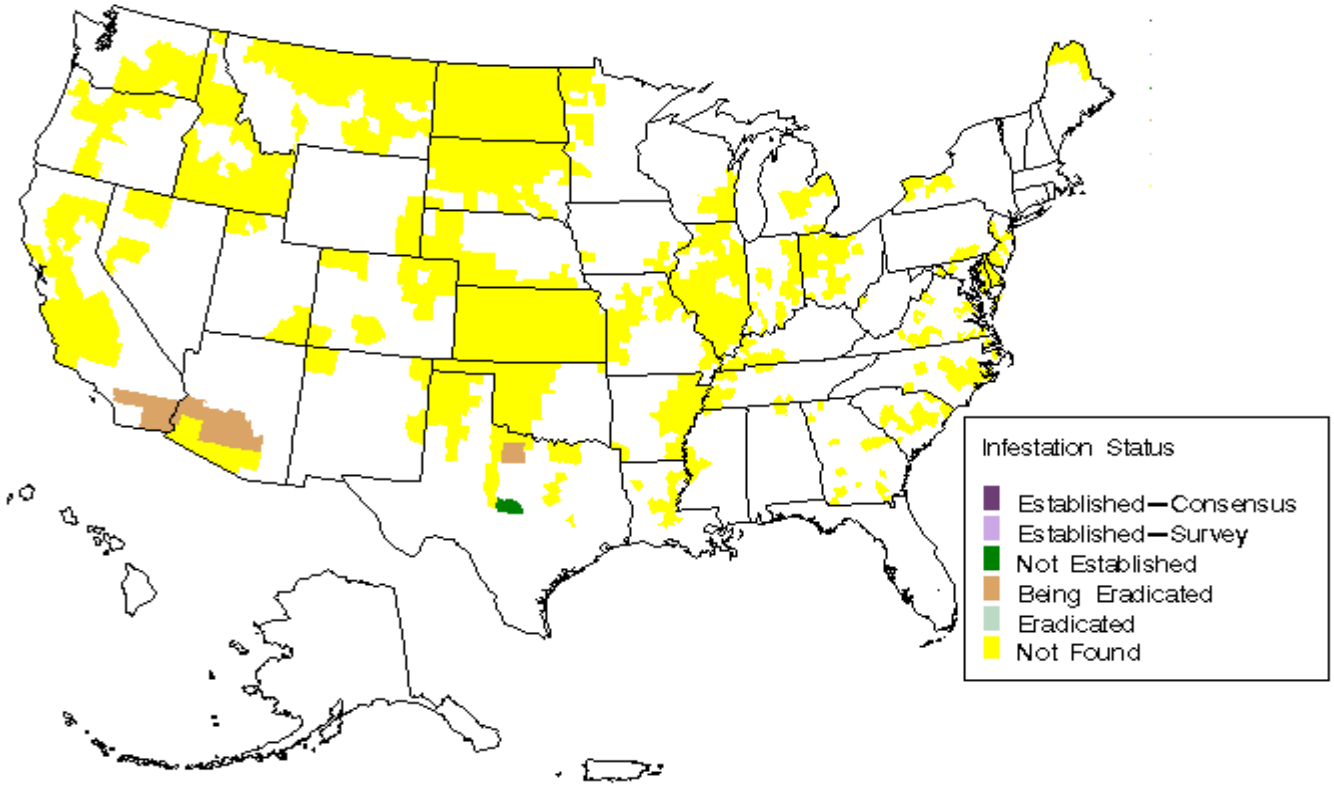


Reported Status of

KARNAL BUNT , TILLETIA (NEOVOSSIA) INDICA

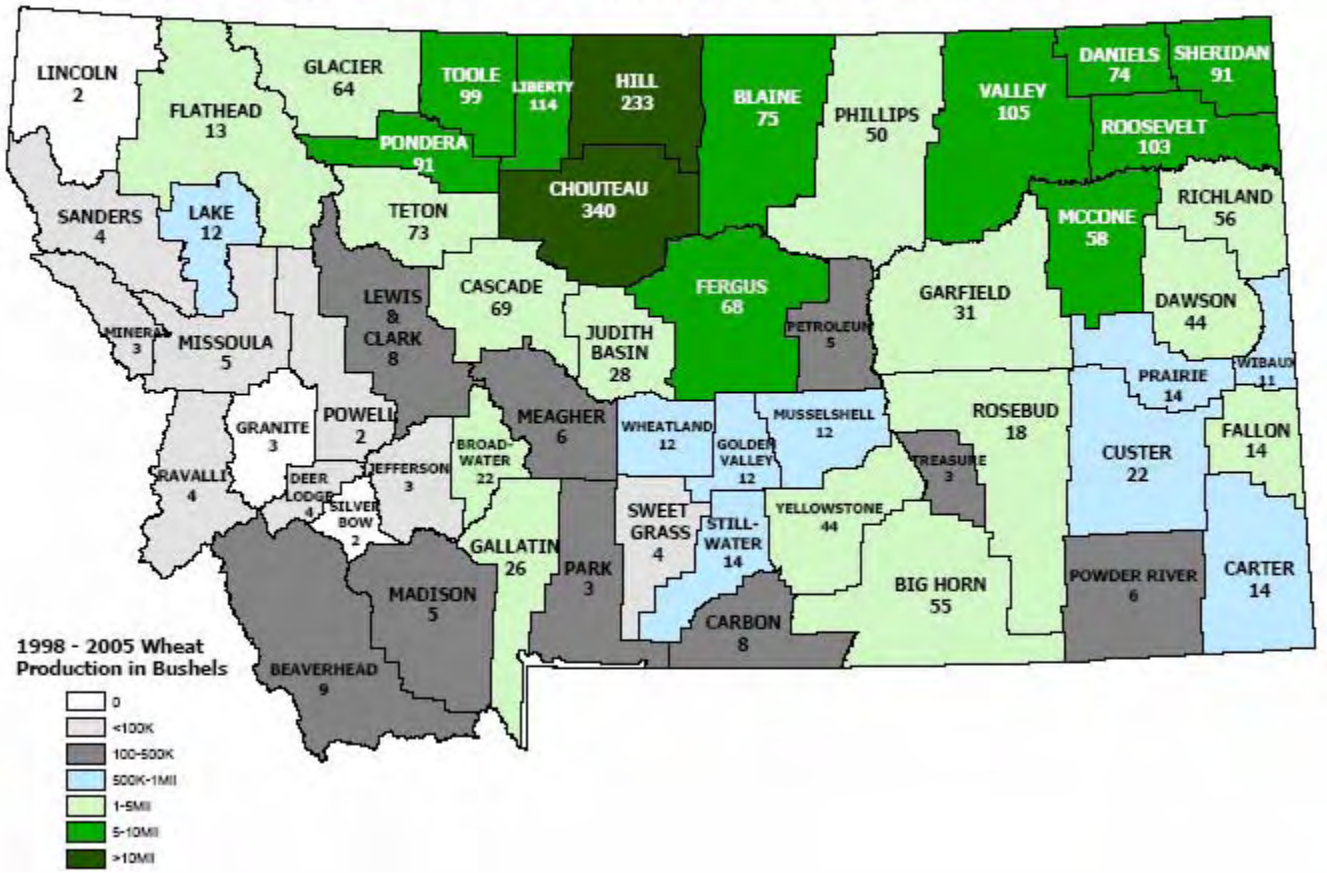
in US and Puerto Rico

Data retrieved from National Agricultural Pest Information System on 03/02/2006



The Center for Environmental and Regulatory Information Systems does not certify the accuracy or completeness of the map. Negative data spans over last 3 years only.

Number of Karnal Bunt Samples Per County, 1996 - 2005
Compared to Average Wheat Production, 1998 - 2005



Karnal Bunt Samples - 1996 through 2005												8 Year Average Production
County	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total # Samples	1998 through 2005
Granite	0	1	0	0	1	0	1	0	0	0	3	0
Lincoln	0	1	0	0	0	0	1	0	0	0	2	0
Silver Bow	1	1	0	0	0	0	0	0	0	0	2	0
Deer Lodge	1	1	0	0	1	0	1	0	0	0	4	5,500
Powell	1	1	0	0	0	0	0	0	0	0	2	8,333
Mineral	1	1	0	0	0	0	1	0	0	0	3	34,833
Sanders	1	1	0	1	0	1	0	0	0	0	4	43,000
Jefferson	1	1	0	0	0	0	1	0	0	0	3	53,250
Sweet Grass	1	1	0	1	0	1	0	0	0	0	4	55,533
Ravalli	1	1	0	1	0	1	0	0	0	0	4	63,329
Missoula	1	1	1	1	0	1	0	0	0	0	5	82,666
Carbon	3	3	0	1	0	1	0	0	0	0	8	213,167
Park	1	2	0	0	0	0	0	0	0	0	3	317,084
Treasure	1	2	0	0	0	0	0	0	0	0	3	323,667
Meagher	2	2	0	0	1	0	1	0	0	0	6	328,250
Powder River	2	4	0	0	0	0	0	0	0	0	6	395,667
Petroleum	1	3	0	0	0	1	0	0	0	0	5	437,667
Madison	1	3	0	0	0	1	0	0	0	0	5	444,250
Beaverhead	2	3	1	1	1	1	0	0	0	0	9	449,167
Lewis & Clark	2	4	0	0	1	0	1	0	0	0	8	462,834
Custer	3	5	4	2	3	2	2	0	1	0	22	573,417
Golden Valley	3	5	1	0	1	0	1	0	1	0	12	632,250
Lake	3	5	1	0	1	0	1	0	1	0	12	679,917
Musselshell	3	5	1	1	0	1	0	0	1	0	12	740,500
Stillwater	4	7	1	1	0	1	0	0	0	0	14	750,334
Carter	3	5	1	1	0	1	1	0	1	1	14	775,000
Prairie	2	6	1	1	0	1	1	0	1	1	14	821,417
Wheatland	4	5	1	0	0	0	1	0	0	1	12	849,534
Wibaux	2	7	0	0	0	0	0	0	1	1	11	853,000
Karnal Bunt Samples - 1996 through 2005												8 Year Average Production
County	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total # Samples	1998 through 2005
Fallon	2	7	0	1	0	1	0	1	1	1	14	1,042,584

Flathead	3	4	1	1	0	1	0	1	1	1	13	1,270,417
Rosebud	6	8	0	0	1	0	0	1	1	1	18	1,271,167
Broadwater	7	8	1	0	1	0	1	1	2	1	22	1,634,667
Yellowstone	11	14	5	2	2	3	2	2	1	2	44	2,305,417
Judith Basin	6	10	2	1	1	1	1	2	2	2	28	2,523,584
Garfield	6	13	2	1	1	1	1	2	2	2	31	2,583,417
Gallatin	6	10	1	1	1	1	0	2	2	2	26	2,822,167
Glacier	17	25	5	2	3	2	3	2	3	2	64	3,396,500
Phillips	17	15	3	2	1	2	1	3	3	3	50	3,840,667
Big Horn	18	19	3	1	2	1	2	3	3	3	55	3,929,334
Dawson	5	21	3	2	1	1	1	3	4	3	44	4,081,917
Richland	10	23	4	2	2	1	2	4	4	4	56	4,593,167
Teton	17	26	7	4	3	4	3	3	2	4	73	4,940,167
Cascade	19	23	5	3	2	3	2	4	4	4	69	4,991,167
Pondera	23	30	9	4	5	4	4	4	4	4	91	5,698,334
Toole	28	36	8	4	4	4	4	4	3	4	99	5,711,334
Blaine	23	25	4	2	2	2	2	5	5	5	75	5,841,167
Liberty	34	38	10	5	5	4	5	4	5	4	114	6,093,917
McCone	6	25	4	2	2	2	2	5	5	5	58	6,330,584
Daniels	17	30	3	1	2	1	2	6	6	6	74	6,477,834
Fergus	17	21	5	2	3	2	3	5	5	5	68	6,653,917
Valley	28	34	8	4	4	4	4	7	5	7	105	8,629,667
Sheridan	22	34	4	2	2	2	2	8	7	8	91	9,067,417
Roosevelt	23	36	7	3	4	3	4	8	7	8	103	9,846,834
Hill	72	72	19	10	9	10	9	10	11	11	233	13,645,500
Chouteau	74	81	22	11	12	11	11	12	13	13	340	18,694,750
TOTALS	568	775	158	85	85	85	85	112	118	119	2190	157,989,250

Montana Department of Agriculture
Cooperative Agricultural Pest Survey Program
2005

Dalmatian Toadflax Biocontrol Agent
Mecinus janthinus Germar

Submitted by David Weaver and Sharlene Sing, Montana State University

The stem mining weevil, *Mecinus janthinus* Germar (Meja) continues to be released on Dalmatian and yellow toadflax in Montana. In 2005, we collected data on a series of releases that were made on Dalmatian and yellow toadflax in 2004. The information for these releases was obtained from required APHIS reporting documents that are returned to the office of the State Plant Health Director after a release is made. The data collection was assisted ably by Cale Davis and Terra Scheer, as well as by an APHIS summer staff member who participated through the kind cooperation of Glenn Harruff of the Billings USDA, APHIS PPQ office. Much additional input on individual release locations was provided by County Weed Coordinators, or in some cases, other individuals who made the releases.

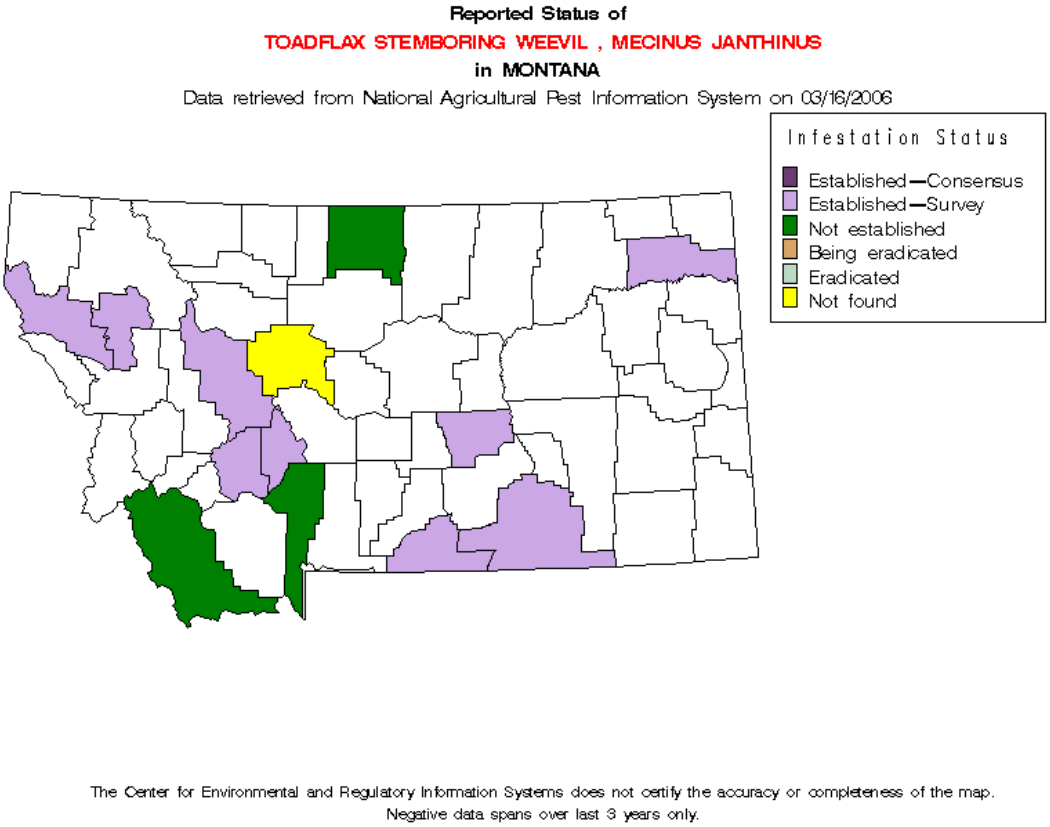
Monitoring was conducted in all counties known to have received Meja in 2004. Counties where transects were established included Beaverhead, Broadwater, Lewis and Clark, Musselshell, Jefferson, Roosevelt, Hill, Gallatin, Sanders, Lake, Carbon, Cascade, and Big Horn. Transects were established when evidence of Meja injury would be evident, starting on 27 and running through 16 August. Evidence of Meja establishment was found in all counties except Beaverhead, Hill, Gallatin, and Cascade. In the case of a number of the unsuccessful releases, it is a function of the candidate agent being released on yellow toadflax, on which we have seen no evidence of success over a number of years now. Other unsuccessful locations occurred as a result of unsuccessful relocation of the release site by the person making the initial release. Finally a few release sites were subsequently subjected to other means of weed elimination, effectively killing Meja.

In order to determine whether Meja established from releases made in 2004, we made traditional 20 meter monitoring transects at each location and collected detailed data on Meja and the plant community. We also collected additional sets of toadflax stems from the area surrounding the monitoring transect, and dissected these to determine if Meja had established and survived the winter. The data was all recorded in MicroSoft Excel spreadsheets that were considerably more extensive than required for reporting in the standard CAPS format. The transects we established were designed to be permanent, and can be used for reference for future monitoring to ultimately provide data on when the biocontrol populations have become large enough for redistribution (that is - to serve as insectaries).

To convert this extensive data to CAPS format worksheet, we determined whether live adults were present within the monitoring quadrat or whether there was evidence of successful adult emergence from dead stems that were collected within the quadrat frame (quadrats were

collected at 2 meter intervals along the transects as indicated in the worksheet). This data is the most conservative, because there were a higher percentage of sites that appeared to have damage that was likely caused by Mecinus larval feeding within the stems or by adult perforation of the leaves. However, this is not absolute, and could possibly come from another source (grasshopper or plant bug feeding). By using the data as we have when we indicate a site is positive, there is no doubt about the fact that adults were present the following year. Additional data on positive establishment was obtained from sets of stems collected near the release sites, as well, and subjected to the same rigorous criteria.

Overall, twenty releases made in 2004 show potential to serve as future insectaries, if the sites are not subjected to remediation using herbicides or other means of weed control that may compromise the survival of Meja. It is recommended that these same sites be surveyed again in 2007 to determine if they can be collected for redistribution, starting in 2008. These sites, along with a number of others established by early research, should provide for an ample supply of Meja for managing Dalmatian toadflax in Montana in the coming years. The sites that failed did so predominantly as a result of human error, and may not be a very good indicator of the potential efficacy of this species as a weed control agent.

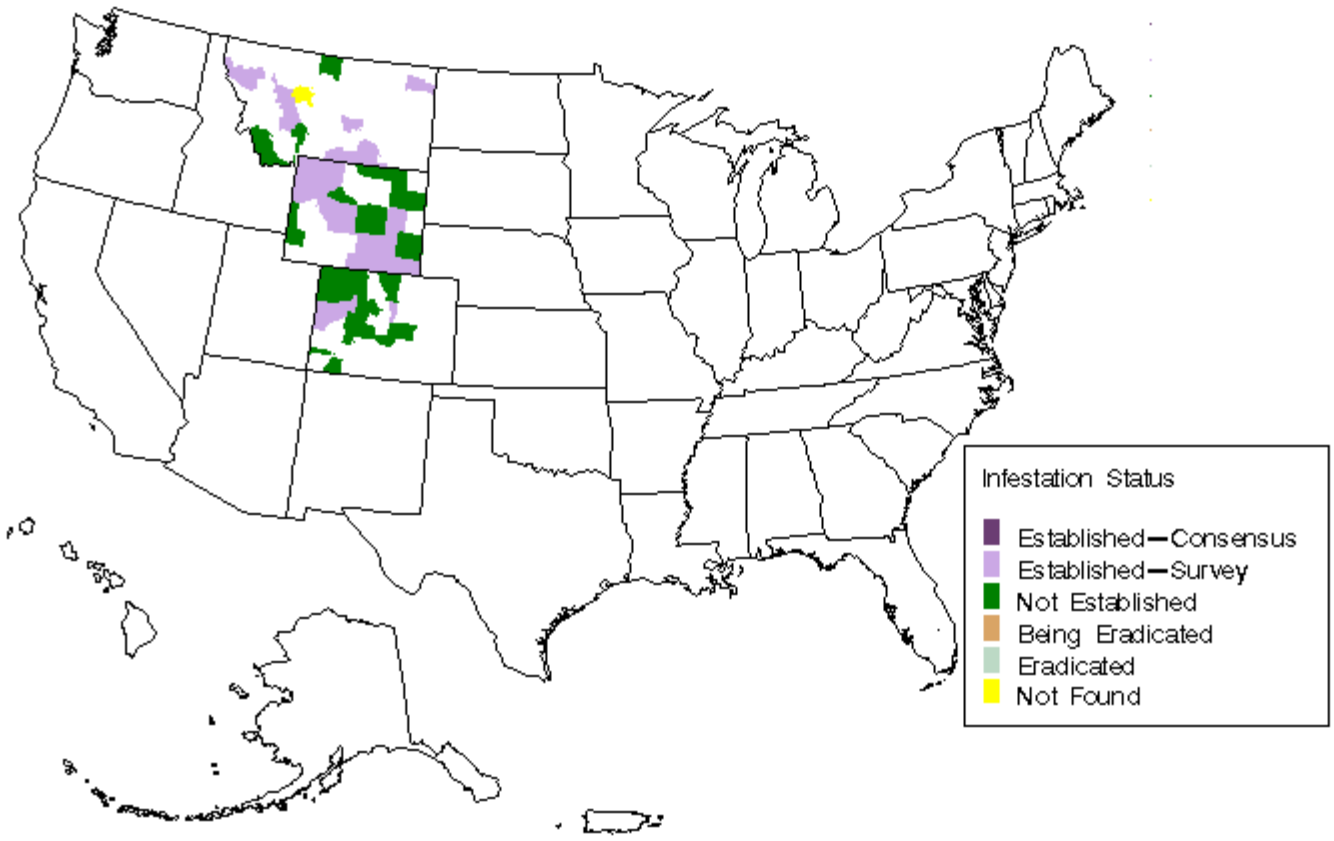


Reported Status of

TOADFLAX STEMBORING WEEVIL , MECINUS JANTHINUS

in US and Puerto Rico

Data retrieved from National Agricultural Pest Information System on 03/16/2006



The Center for Environmental and Regulatory Information Systems does not certify the accuracy or completeness of the map. Negative data spans over last 3 years only.

Montana Department of Agriculture
Cooperative Agricultural Pest Survey Program
2005

Gypsy moth, *Lymantria dispar*

Region 1: Idaho, Montana, North Dakota, Wyoming

Submitted by: Leah Chapman, USDA Forest Service

Cooperative detection monitoring continued for the gypsy moth in Region 1 with APHIS, and State Departments of Agriculture, Forestry, and Lands in 2005. A network of strategically located pheromone-baited traps was placed throughout all Region 1 states. Two moths were captured on Federal land in Yellowstone National Park. The first was trapped at Fishing Bridge RV Park, which is the same trap site where one moth was captured each year from 2001 to 2003. A second moth was trapped at Madison Campground, also in Yellowstone NP. Delimitation surveys near the Fishing Bridge RV Park were still in place as a result of the 2003 catch.

A single European gypsy moth was trapped on private land near Enaville in the Idaho panhandle. Delimitation surveys will be instituted for the area surrounding this trap catch, and will be continued for last year's Asian gypsy moth catch near Hauser, ID. There have been no new AGM catches following the suppression project where 600 acres were sprayed with Btk4a48b. No moths were caught in Montana or North Dakota in 2005.

Aside from the new delimiting grid in the Idaho panhandle, the trapping program will continue as usual in Region 1 next year.

Montana Department of Agriculture
Cooperative Agricultural Pest Survey Program
2005

Silver Y Moth Detection and Delimitation Survey Report

Submitted by Will Lanier, Montana State University

The Silver Y Moth (*Autographa gamma*) is an emerging pest (Ranked 2 on the Western Region Pest List) of various crops including both potatoes, broadleaf and cereal grains. The Silver Y Moth (SYM) detection and delimitation survey was designed to determine if SYM, is found in Montana. If SYM was found, the trapping program would give some indication of the extent of the infestation.

A network of pheromone trapping sites (@40) managed by individual site cooperators (4-H, Extension agents and producers) for detection of a number of native cutworm moths already operates in Montana. The proposed survey added 40 PheroTech Uni traps baited with pheromone specific for Silver Y moth, *Autographa gamma*, to the current network. Sampling was conducted in Beaverhead, Big Horn, Blaine, Cascade, Chouteau, Custer, Powder River, Daniels, Dawson, Fallon-Carter, Flathead, Gallatin, Glacier, Hill, Judith Basin, Liberty, Phillips, Pondera, Prairie, Richland, Roosevelt, Sweet Grass, Teton, Toole, Yellowstone and Carbon counties.

Each week for 8 weeks beginning approximately Aug 1st. cooperators install and begin monitoring the number of moths caught in pheromone traps. Each week the catches are recorded and data is submitted to allow the Cutworm Risk warning for that area to be estimated. During the cutworm trapping process the contents of the SYM traps were be bagged and refrigerated until they were mailed/delivered to the MSU Schutter Diagnostic lab.

Trap examination and identification of suspect moths were done in a tiered system, with the insect diagnosticians at Montana State University (Bozeman) first examining the specimens following a dissection protocol developed by Richard Worth, Lepidopterist & Insect Program Specialist at the Oregon Dept. of Agriculture, Plant Division, conferring with MDA State Entomologist and if necessary confirming identifications with USDA specialists.

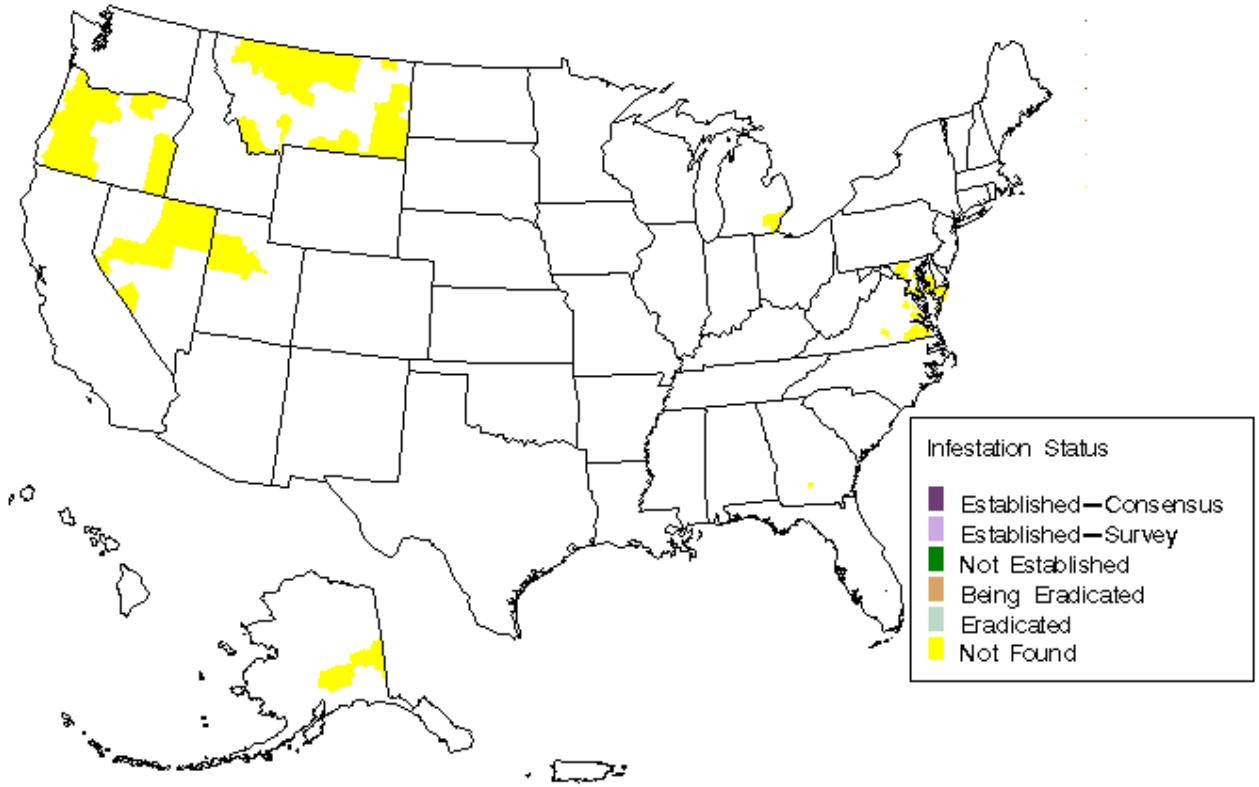
No SYM were collected in 2005. The majority of our specimens were Alfalfa looper (*A. californica)* with a few unknowns that were not *A. gamma.*

Reported Status of

SILVER–Y MOTH , AUTOGRAPHA GAMMA

in US and Puerto Rico

Data retrieved from National Agricultural Pest Information System on 03/16/2006



The Center for Environmental and Regulatory Information Systems does not certify the accuracy or completeness of the map. Negative data spans over last 3 years only.

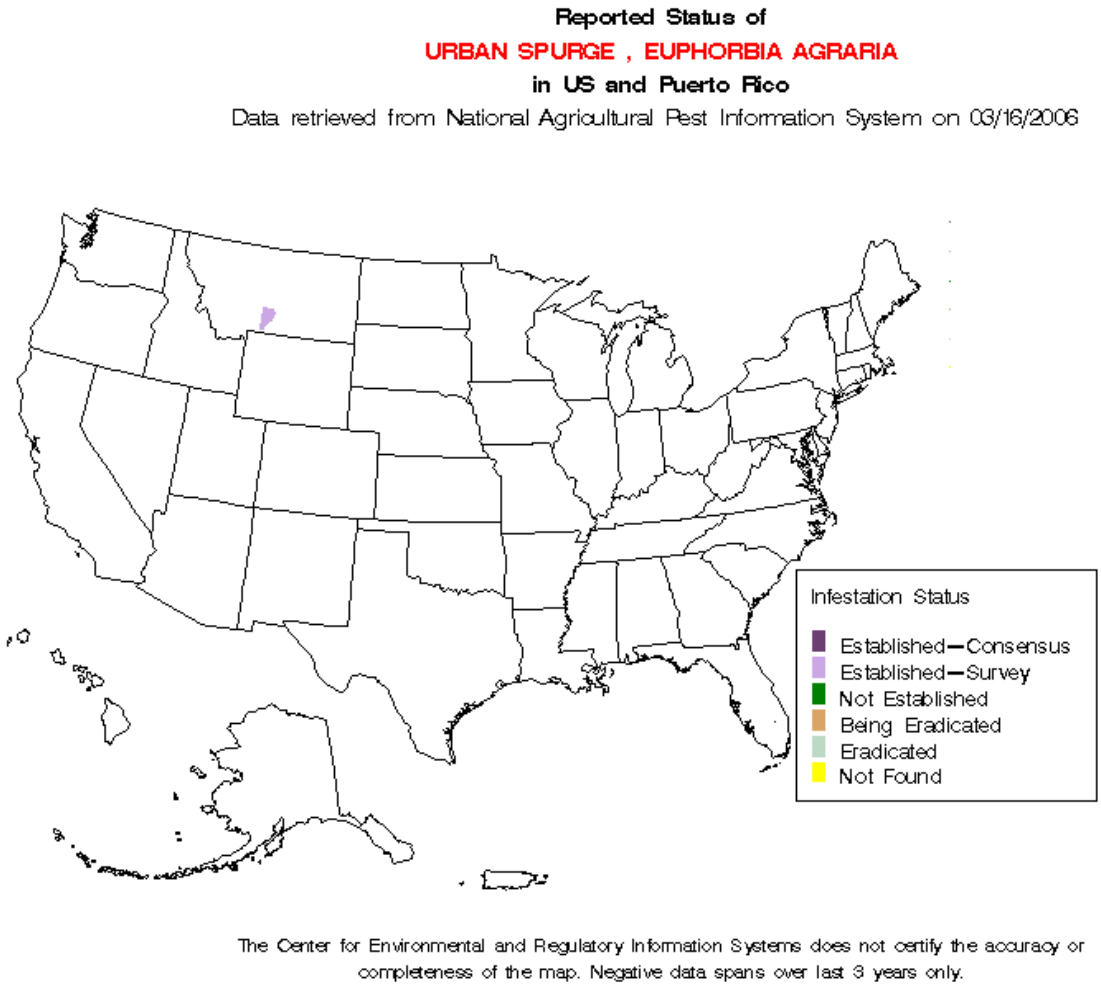
Montana Department of Agriculture
Cooperative Agricultural Pest Survey Program
2005

Urban Spurge Survey Report

Submitted by: Stacey Barta, Sweet Grass County

Sweet Grass County began surveying for the urban spurge in July 2005. Approximately 20,000 acres were surveying using ATV's, 4 wheeled drive vehicles and by foot travel. Infestation locations were mapping using GPS. Specimens were collected and sent to Montana State University and University of Montana in various vegetative stages.

The located infestations were limited and did not appear to spreading at an alarming rate. The plants also appeared to be affected by biocontrol specific to leafy spurge. Apthona species and Oberea species were noted on various patches of urban spurge.



Montana Department of Agriculture
Cooperative Agricultural Pest Survey Program
2005

Saltcedar Survey Report

Valley County

Submitted by: Rick Stellflug, Valley County Weed District

Our survey for 2005 covered an area north of the CMR from the Hill Ranch to the Phillips County line. The Willow Creek and Ridge Roads were the north boundary lines. Fortunately we did not find any saltcedar.

We also searched the milk River from Bjornberg Bridge to Vandalia Dam, with the Valley County Search and Rescue riverboat. Volunteers from Search and Rescue and Beth Klempel from BLM helped with this survey. We inventoried 35 miles of riverbank and didn't find and saltcedar. The search was prompted because of several trees that were found along the Milk River in Blaine County this summer.

In 2004, a multi-agency management team met to form a saltcedar WMA (Weed Management Area). The Fort Peck Saltcedar Management Team consists of 12 members, representing the following: Valley County, McCone County, Garfield County, Phillips County, Fergus County Petroleum County, Jim Thompson, project leader; Beth Klempel, BLM; Patricia Gilbert, Corp of Engineers; Hoyt Richards, DNRC; Steve Henry, USFW; and two private landowners, one from the north side and one from the south side of the lake.

The team members compiled information of known saltcedar infestations along Fort Peck Reservoir. The information was accumulated and a final map was produced. The map shows where the saltcedar is present on a section basis, the priority and if it was treated. This summer the USFW had a "strike team" working on their areas of Devil's and Hell Creek. The team started at the head of the drainage and worked their way to full pool level.

In conclusion we are achieving our survey goals in most of the counties around Fort Peck Lake. Jim Thompson has been very instrumental in getting all the entities together and compiling survey information. We all know that weeds know no boundaries or landownership therefore; we are all in this battle together. We all appreciate the funding from CAPS and feel that it has helped a very worthwhile ongoing project.

Petroleum County

Submitted by: Clint Clark, Petroleum County Weed District

Our survey area covered the Musselshell River from its mouth to the town of Roundup, MT. There is an existing Saltcedar bio release site in this survey area. Three other sites have

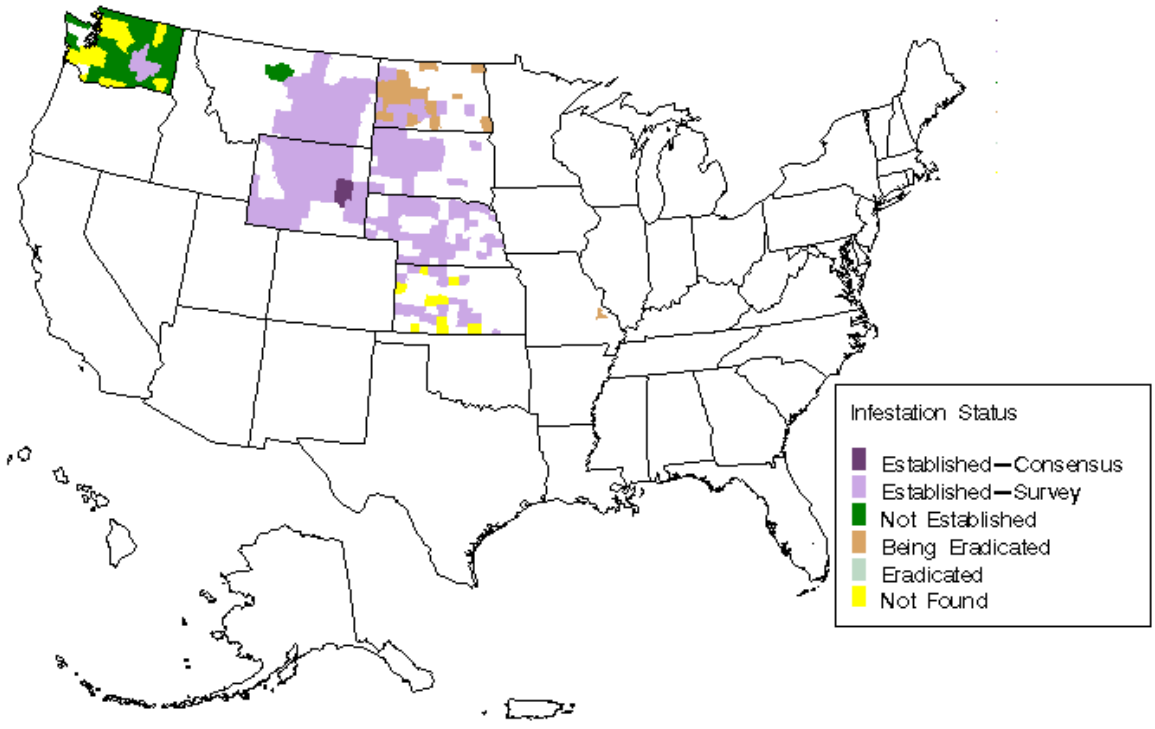
concentrations of Saltcedar that might be called patches, whereas the rest of the survey area, outside Petroleum Co. are individual plants or small strips. The Saltcedar in the survey area in Petroleum Co., except CMR lands, will be chemically treated this summer. We hope the biocontrol release upstream will reduce the seed spread, re-infestation and provide long-term control in the treated area. Site 3 contains approximately 30 acres of Saltcedar in the 70 acre site, this site is within the CMR and is being dealt with by them. The probable acreage of Saltcedar in the survey area is 75.

Reported Status of

SALTCEDAR , TAMARIX RAMOSISSIMA

in US and Puerto Rico

Data retrieved from National Agricultural Pest Information System on 03/16/2006



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Montana Department of Agriculture
Cooperative Agricultural Pest Survey Program
2005

Whitetop Mapping Project Report

Southwest Montana Multi-County

Submitted by: Butte Silver Bow Weed Control Department

Beaverhead and Silver-Bow Counties: Hired aircraft to survey and GPS infestations of whitetop within the counties. Selective ground surveys and all the data collected has been entered into a database. The Butte Silver Bow GIS department verified the data obtained and the data has been forwarded to the Montana Department of Agriculture GPS office (Patrick Dougherty). Butte Silver Bow GIS Department is currently refining the data to a PDF file for distribution to all entities involved.

Jefferson and Broadwater Counties were unable to perform the projects due to weather conditions with in their respective counties.

Pondera Creek

Submitted by: Steve Becker, Pondera County Weed Coordinator and Jim Ghekiere, Liberty County Weed Coordinator

The purpose of this project was to inventory infestations of Whitetop (hoary cress), *Cararia draba,* on Pondera Creek throughout its entire course in Pondera and Liberty Counties. The project is just one of several whitetop inventories being conducted across Montana for this project. The data collected will be submitted to APHIS and will be used to prepare for the introduction of biological weed controls for whitetop that may become available soon. A complete inventory of infested areas in the state was needed, first, to determine the severity of the whitetop problem in the state, and also for identifying for potential release sites for the biocontrol agents as they become available.

An additional benefit of this project for the County Weed Districts was to compile a complete GIS database inventory of the whitetop infestations for each county. This data will benefit the weed management efforts of the counties in controlling and eradicating these plants, and in identifying and protecting areas, which are threatened, but not infested at this time.

The Pondera and Liberty County Weed Districts began mapping the project area with Garmin GPS units in early May. At this time the whitetop plants were in the early rosette stage and were beginning to bolt. At this time we mapped the heaviest known infestations, which we knew would be easiest to find. By May 23rd, the plants had flowered and were easily distinguishable throughout the area for locating them and mapping. Mapping continued into June, when the flowers began to lose their color and the plants began to set seed. By this time even the smallest

patches of plants were easy to distinguish, so it was relatively easy to collect accurate data for these locations. The final data was collected in late July.

Approximately 80 miles of the riparian zone along the creek were mapped and inventoried. A buffer zone of ¼ mile on each side of the creek was selected for the project boundary and inventoried area. We found the heaviest infestations of whitetop are located on upper Pondera Creek, beginning near the town of Conrad, and down the creek, for approximately 25 miles. In this stretch of the creek, the whitetop is extremely dense on both sides of the creek. We found very few uninfested areas. As you move downstream, the density of plants decreases, and the large, several-hundred acre infestations we found, decreased in size to 1 to 3 acre patches. These patches became more intermittent as we progressed downstream into the small section of creek in Chouteau County, and into Liberty County.

A total of 3764 acres of whitetop were mapped and inventoried along Pondera creek. There were many acres of uninfested ground, areas that became larger and more prominent as we moved downstream.

It is our determination, that the upper Pondera Creek, with its extremely high whitetop plant density, would be an ideal location for any introduction and research work on biological controls for whitetop.