



2013 Insect Report



Utah Department of
Agriculture and Food

PLANT INDUSTRY



2013 UDAF Insect Report



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Protecting Utah Agriculture

Utah agricultural industries are valued at over a billion dollars annually, which constitutes about 22% of the state's land in agricultural production. The mission of the Utah Department of Agriculture and Food (UDAF) is to "Promote the healthy growth of Utah agriculture, conserve our natural resources and protect our food supply." Managing insects is essential to this mission. Although most insects are beneficial, pest infestations can be devastating. Hence UDAF Plant Industry has been addressing insect issues since pioneer agriculture began here 160 years ago. Some economic estimates of losses to U.S. food crops due to pests approach 40%. Both newly introduced insects and outbreaks of endemic species can cause sudden losses much like a natural disaster. Trends that contribute to these losses include erratic weather patterns and climate change, intensive monoculture farming methods and global commerce, which commonly transports materials of risk great distances. The UDAF Plant Industry Insect Program aims to protect Utah agriculture, food, and quality of life from losses due to insects.

Goals and Strategies of the Insect Program

Prevention and Protection

Insects are transported in various ways, often unintentionally. Using quarantines and inspections can prevent the establishment of new pests. Surveillance of insects with outbreak potential allows protection of resources at risk.

Early Detection

Using strategic detection, diagnostic networks, and trap and survey technology to detect pests as early as possible minimizes insect damage and the cost of eradication or control. UDAF Plant Industry annually surveys and traps over 8,000 locations statewide and works with partners nationwide to share information and employ the latest detection methodology.

Insect Control

There are many effective tools for insect control and more are being developed. UDAF Plant Industry uses survey methods, predictive models and economic thresholds to determine the best course of action using a variety of tools to suppress pest populations such as: chemical pesticides, biological controls or cultural methods.

Public Education

Raising awareness of how insect pests are introduced and the consequences of outbreaks can facilitate early detection efforts and protect resources. Teaching Integrated Pest Management principles can also help protect beneficial insects and increase environmental stewardship.



Public Education & Detection

Africanized Honey Bee

UDAF Plant Industry

Africanized honey bees are slightly smaller in size, will live in smaller cavities and will swarm more times per year than European honey bees. They will aggressively defend their hives but may attack unprovoked. They will follow people or animals a much further distance from the hive and may sting thousands of times per attack. Though it is dangerous, this insect has been unfairly sensationalized in the media; education efforts have decreased panic and stinging incidents nationwide. These bees are typically found next to water sources such as rivers, streams, lakes, canals, and man-made sources. It is thought that these water sources are the highways in which the bees migrate.

In 2008, AHB was detected in Utah, in the St. George area. Shortly after, they were found in Kane and Iron counties as far north as Parowan. In 2010, AHB was found in San Juan County in the small town of Bluff. UDAF Plant Industry has been working with beekeepers, setting traps and monitoring feral colonies for AHB since the 2008 detection. In 2013 no swarms were caught in UDAF traps but several potential aggressive colonies were tested from areas of concern such as Moab in Grand County and Escalante in Garfield County. None of the colonies in those areas tested positive for AHB and therefore were likely aggressive for other reasons such as cultural or environmental factors. Currently there are 48 AHB traps in 8 southern Utah counties to monitor the movement of AHB northward. UDAF will continue to monitor and trap for AHB in the future in an effort to inform the public of the presence of AHB in their communities. The program strives to educate the public and commercial beekeepers about AHB, and to address their concerns.



SCOTT BAUER, USDA ARS

Fig. 1 An Africanized honey bee (left) and a European honey bee (right).



Pollinator Protection

Apiary Program

UDAF Plant Industry

Utah, the “Beehive State”, is home to over 1500 registered beekeepers that produce well over a million pounds of honey each year. Honey bees are key pollinators of many crops throughout the state, from large-scale orchards and farms to backyard fruit trees and gardens.



CLINT BURFITT, UDAF

Fig. 2 UDAF Apiary Program inspectors examine a beehive for pest and disease problems.

The ability of UDAF Plant Industry to work closely with municipalities on updating regulations to allow urban bee keeping is reflected in the record increase of new beekeepers along the Wasatch Front and in rural areas. Newly registered beekeepers have nearly doubled in the past two years. The health of Utah’s bees is vital to our communities and farmers. The numerous diseases, parasites, and illnesses that affect our colonies are important concerns for UDAF Plant Industry.

The combined efforts of the state bee inspector and numerous county bee inspectors resulted in over 1,700 hives surveyed for overall health. Inspections and test results revealed outbreaks of American foulbrood (AFB) in Millard, Salt Lake, Summit, Utah, and Weber counties. UDAF alerted all registered beekeepers within a 2 miles radius of the outbreaks via phone and email to warn apiarists of the contagion’s presence in their area.

Through media contacts and general public inquiries UDAF Plant Industry annually fields hundreds of phone calls and emails regarding bees. In 2013 the program sent a mailer to all registered beekeepers regarding honey bee health and conducted numerous outreach events for beekeeper associations and the general public. Through these efforts, UDAF Plant Industry raised awareness about the importance of beekeeping to the ecosystem and agriculture.



Fruit Industry

Apple Maggot & Cherry Fruit Fly

Utah Fruit Growers
UDAF Plant Industry



ELIZABETH BEERS, WSU

Fig. 3 An adult cherry fruit fly on a cherry.



ELIZABETH BEERS, WSU

Fig. 4 Cherry fruit fly larvae exiting a cherry.

The apple maggot (*Rhagoletis pomonella*), also known as the “railroad-worm,” and the cherry fruit fly (*R. indifferens*), are both picture-wing flies native to North America. Both insects have become major pests of fruit trees in the U.S. and Canada. The UDAF Plant Industry program began in 1985 with the discovery of apple maggot in abandoned and non-commercial cherry orchards in Utah County. In 2013, 16 sites were monitored during the growing season and cherry fruit flies were found in Box Elder, Davis, Salt Lake, and Utah counties.

There are approximately 615 commercial fruit growers in Utah, with a commercial value of an estimated \$17 million annually. All fruit marketed for export must be free from any apple maggot and cherry fruit fly injury, so thorough and effective control measures are necessary. This program allows Utah fruit growers to export fruit outside of Utah.

In addition to trapping, this program provides commercial growers with information to improve insecticide spray timing. Accurately timed sprays result in the following: better control, smaller amounts of pesticides being used, less environmental impact, and lower production costs. Without proper control, these insects could cause serious damage to all tree fruit grown in the state.



Natural Resource Protection

Asian Defoliators

UDAF Plant Industry
USDA APHIS—PPQ
DHS USCIS

Asian defoliators (e.g., *Dendrolimus pini*, *D. sibiricus*, *Lymantria monacha*, *L. dispar asiatica*) pose a significant potential threat to Utah’s forests and related industry. Due to an increase of shipments of containerized cargo and the movement of plant material into Utah, monitoring for the presence of Asian defoliators and other exotic forest pests is crucial to protect our natural resources. Exotic defoliators, if introduced, have a large host range that include all species of conifer and hardwood trees found throughout the state. The forests and climate of Utah provide ideal settings for these species to become established. Asian defoliators can be introduced through commerce because females can deposit eggs in crevices on containers, pallets, and ships. Adult moths have been observed in many Asian and Russian Far East ports. Using pheromones specific to these pests, UDAF Plant Industry places traps in high-risk areas of the state. Trapping areas include shipping corridors along railroads and highways, landing points including airports and military bases, areas where large quantities of plant debris are collected, and any high risk areas recommended by U.S. Customs and Immigration Service and USDA APHIS-PPQ. In 2013, 380 traps were deployed to detect adults of these species with negative results for all species.



STANISLAW KINELSKI, UGA

Fig. 5 A larvae of the *L. monacha*.



JAN LISKA, FGMRI

Fig. 6 Heavy defoliation of Norway spruce (*Picea abies*) by the *L. monacha*.



Fruit Industry

Brown Marmorated Stink Bug

USU Department of Biology,
Lori Spears
UDAF Plant Industry

The first U.S. detection of the brown marmorated stink bug (BMSB), *Halyomorpha halys*, which is native to Asia, occurred in the 1990's in Allentown, PA. Since its introduction it has spread quickly, having been reported in 33 states thus far and recently causing severe damage in some states. Unlike many agricultural pests, BMSB is a year-round problem. It can cause severe damage as it feeds on fruits and leaves, resulting in necrotic tissue and cat-facing injury. In the fall, BMSB migrates indoors where it aggregates, becoming a nuisance pest and emitting a foul odor when disturbed or destroyed.



STEPHEN AUSMUS, USDA ARS

Fig. 7 BMSB can migrate into buildings and become nuisance pests.

Continued survey for the BMSB was conducted in Utah in 2013. A total of 26 brown marmorated stink bug traps were placed at 26 different sites in 3 counties. Traps were in place from June to November, 2013. Sites included community gardens (multiple vegetable crops) and farms growing caneberreries, sweet cherries, tart cherries, apples, peaches, and other fruits. Traps were checked for BMSB presence every two weeks. Lures were replaced every four weeks. Through cooperative efforts a total of four BMSB's were found: three in Salt Lake County and one new county record detected in Utah County.

In 2014, state agricultural officials plan on continuing to survey for this pest in commercial orchards throughout Northern Utah.



Crop Protection Export Program

Cereal Leaf Beetle

UDAF Plant Industry
USU Department of Biology,
Ted Stevens Lab



JOHN TOOKER, PENN STATE

Fig. 8 No cereal leaf beetles were detected in UDAF's 2013 survey.

The cereal leaf beetle (CLB; *Oulema melanopus*), has been spreading across the U.S. for about 50 years. In Utah, it was first recognized in Morgan County in 1984, where it was causing economic damage on barley, oats, and wheat. Since then it has infested the cooler, moister counties in Utah. The CLB prefers irrigated fields of oats, wheat, and barley. In 1984, UDAF Plant Industry began annual statewide surveys for this pest, in part to satisfy the requirements of the California Cereal Leaf Beetle Quarantine, so that Utah growers could export to California. In 2013, the survey included Utah's counties with hay and cereal export potential. The following counties were surveyed: Garfield, Iron, Millard, Sanpete, San Juan, Sevier, Washington, and Wayne. A total of 41 surveys were conducted and no CLB was detected.

In northern counties, where CLB is established, detected levels lower were than in years past. This was probably due to the successful release of a biological control agent, the wasp *Tetrastichus julis*, which parasitizes and kills the CLB larvae. Utah State University Department of Biology continues to release this biological control species and past CLB surveys have determined that all counties positive for CLB also have substantial levels of these parasitoids. The parasitoids population stays highest when growers tolerate sub-economic levels of CLB. In contrast, the parasite population is set back substantially with each chemical application to control CLB.



Emerald Ash Borer

USDA APHIS PPQ
UDAF Plant Industry

Emerald ash borer (EAB; *Agrilus planipennis*) is native to Asia, and was introduced through wood packing material used to ship cargo from Asia to Michigan in 2002. EAB continues to spread rapidly to states and provinces in and around the Great Lakes region in Canada and the USA. EAB quickly killed many millions of ash trees (*Fraxinus* sp.) in these areas and can now be easily spread from infested areas by transporting infested trees, logs and especially firewood. In its native ecosystem in Asia, this insect exists in balance with competitors, natural predators, and pathogens. It does not cause economic damage in this setting. However, in North America, without these balancing factors, EAB has caused rapid tree mortality affecting all ash species it attacks. Symptoms include crown dieback initially, which progresses until the tree is dead. Epicormic shoots, splitting bark, increased woodpecker damage, serpentine galleries, and D-shaped exit holes are also symptoms of EAB infestation.



STEPHEN AUSMUS, USDA ARS

Fig. 9 The emerald ash borer was recently discovered in Colorado.

In addition to Utah's many ornamental ash trees in urban landscapes, there are two native ash species that are part of the forest ecosystem. All of these species would be vulnerable to EAB attack, causing economic and aesthetic losses in urban areas and ecological impacts in natural settings. In 2013, UDAF placed 42 baited traps along the Wasatch Front, targeting high-risk ash trees with symptoms associated with unhealthy or declining trees. No EAB was detected.



European Corn Borer

UDAF Plant Industry

This highly adaptable pest attacks over 200 plant species. During its early history in the United States, the European corn borer (*Ostrinia nubilalis*) spawned one generation yearly. By the late 1930s, a two-generation per annum European corn borer mushroomed swiftly and became a dominant pest in the central Corn Belt. It continued spreading in all directions, with the southernmost populations spawning three and four generations per year.

UDAF Plant Industry administers a quarantine for small grains and other agricultural crops that may contain the European corn borer to prevent this destructive insect from entering Utah. When shell corn is brought into the state from the Midwest every year, the shipments are certified that they meet Utah's European Corn Borer Quarantine.

UDAF Plant Industry also coordinates a European corn borer trapping program. This program consists of 98 traps placed each year in chief corn producing areas including 17 counties. No new records of the European corn borer were found in Utah in 2013.



KEITH WELLER, USDA ARS

Fig. 10 The larval form of the European corn borer has a pinkish tan body.



KEITH WELLER, USDA ARS

Fig. 11 The female moth (pictured) has a dull, buff color; the male moth is brown.



Invasive
Species
Early
Detection

Gypsy Moth

UDAF Plant Industry
USDA APHIS—PPQ
USDA Forest Service—FHP



SCOTT BAUER, USDA ARS

Fig. 12 UDAF has successfully eradicated gypsy moth populations introduced to Utah.

Gypsy moth (GM; *Lymantria dispar*) is established in the eastern U.S. Because their egg masses are laid on virtually any substrate, they are often moved long distances to new territory. Utah's arid climate and mountainous terrain have a high potential for GM introduction and establishment capable of causing widespread negative impacts on Utah's landscapes. Because Utah is not part of the contiguous range of

GMs, early detection and eradication are cost effective strategies to prevent establishment of this forest and urban pest in Utah.

GM was first found in Utah in 1988. Since then, UDAF Plant Industry has been the lead agency in the administration of a major survey and control program. When populations are found, they can be treated and effectively eradicated before damage occurs. UDAF Plant Industry has successfully eradicated introduced GM populations twice using the bacterium *Bacillus thuringiensis* var. *kurstaki* (*Btk*) and annually monitors for new introductions. In 2013, Utah Gypsy Moth Program placed 1,669 detection traps using the GMWest model Bi-oSIM to determine areas of highest risk of introduction and establishment. This model integrates climate and elevation data to predict the probability of GM establishment. Two male moths were caught in 2008, and from 2000 to 2009, the GM detection program has trapped 15 single males in individual pheromone traps. In every case, further delimitation surveys have produced negative results. No GM has been detected in Utah since 2010.



Early
Detection &
Eradication

Japanese Beetle

UDAF Plant Industry
USDA APHIS—PPQ



STEPHEN AUSMUS, USDA ARS

Fig. 13 Japanese beetles are most active during hot, sunny weather.

The Japanese beetle (JB; *Popillia japonica*) is a highly ruinous pest which causes plant damage and increases control costs. It has swept through most of the eastern United States. Adults attack more than 300 species of plants, including numerous trees, ornamental shrubs, vines, fruits, flowers, vegetables, garden crops, weeds, and field crops. Larvae are serious pests of lawns, other grasses, and nursery stock. Because the larvae are easily shipped with nursery stock and soil, JB is a serious threat to Utah's \$128 million nursery and floriculture economy and has been part of UDAF Plant Industry's detection trapping program since 1993. When a JB infestation was discovered in Orem, Utah in 2006, the infestation was delimited using pheromone baited traps, and an eradication plan was devised.

Treatment began in 2007 with turf and foliar applications. Delimiting data has allowed the treatment areas to shrink over consecutive years and no treatments were conducted in the last year. In 2013 a single JB was caught in Salt Lake County and after implementing a high density trapping grid no more beetles were found. Continued delimit trapping will be conducted in the area during 2014.

Attention will focus on the nursery plant trade in 2014 and continued state wide monitoring will occur to ensure this pest does not establish in Utah.



Cropland &
Rangeland
Habitat
Protection

Mormon Cricket & Grasshopper

UDAF Plant Industry
USDA APHIS—PPQ

For the past nine years, disaster declarations by the governor have focused resources (administered through UDAF Plant Industry) to provide relief from major infestations of Mormon crickets (*Anabrus simplex*) and grasshoppers (various genera). Mormon cricket and grasshopper infestations are historically significant because they are difficult to predict and cause widespread damage to crop and rangeland habitats. The overall goal of the UDAF Plant Industry grasshopper and Mormon cricket program is to facilitate biologically sensitive and effective suppression programs before widespread damage occurs. The elements that contributed to successful projects in 2013 were: Available funding, collaboration with all affected stakeholders, accurate survey data, availability of suitable contractors, updated environmental documentation and access to effective chemical technologies.

In 2013, grasshopper treatment programs were conducted to protect vulnerable crop and rangeland habitat in Beaver, Iron, Sanpete, and Washington Counties: a total of 23,874 acres were treated. UDAF Plant Industry also shared some of the cost of treatment with farmers and ranchers with infestations of grasshoppers on private land.



MICHAEL THOMPSON, USDA ARS

Fig. 14 Despite their name, Mormon crickets are actually shield-backed katydids—not crickets.



Fruit
Industry
Export
Program

Plum Curculio

Utah State University
Utah Fruit Growers
UDAF Plant Industry



ELI LEVINE, OSU

Fig. 15 The plum curculio feeding puncture is round in shape (pictured), whereas egg punctures are crescent-shaped.

Utah's fruit industry is valued at approximately \$17 million annually, with over 615 operations growing at least 6,700 acres of cherries, peaches, and apples. Plum curculio (*Conotrachelus nenuphar*) is a pest of stone and pome fruits and is native to eastern North America. In 1999, it was detected in home and yard fruit trees in Brigham City.

The presence of plum curculio in Brigham City is sustained by unmanaged fruit trees located in residential areas, which serve as a reservoir for populations of this insect. Each year Utah State University and UDAF Plant Industry, in conjunction with Brigham City, send out an informational pamphlet to educate home owners about this insect and how to manage or remove the fruit trees.

Utah fruit orchard survey consists of 16 sentinel sites in Box Elder, Utah and Davis Counties. Traps designed to collect plum curculio with a specific lure were placed at each site. Traps were serviced every two to four weeks from late May to early September in 2013. 10 plum curculios were detected in three different locations in Box Elder County. No plum curculios were detected in Weber and Utah Counties.



Public Health & Nuisance

Red Imported Fire Ant

USDA APHIS—PPQ
USU Department of Biology,
James Pitts Lab

Imported fire ants are both a public health risk and an economic threat. They are federally quarantined pests not known to occur in Utah, but easily introduced in infested soil. They were first introduced to the southern U.S. in the 1930s from South America. Imported Fire ants can feed on many agricultural crops, including corn, soybean, and fruit trees. The aboveground mounds make cultivation, irrigation, and harvesting almost impossible. Imported fire ants can infest urban areas and become a nuisance that deters outside activity. Not only are imported fire ant mounds unattractive, the ants are aggressive and sting humans and other animals. UDAF Plant Industry uses quarantine enforcements, port of entry inspections, and public education to keep Utah free of imported fire ants. Annual surveys to detect introductions of red imported fire ant (RIFA; *Solenopsis invicta*) and the black imported fire ant (BIFA; *S. richteri*) focus on Washington County, the most suitable climate and habitat in Utah.



RICHARD NOWITZ, USDA ARS

Fig. 16 RIFA can sting humans repeatedly; their venom can result in severe blistering.

Utah State University sampled 56 sites in 2013; representative ants from seven genera were collected. During this survey, RIFA or BIFA was not detected at any of the sites. A native *Solenopsis* species, *S. xyloni*, was detected at several sites, its presence indicates RIFA/BIFA have not yet established in Washington County, Utah.



Fruit Industry

Spotted Wing Drosophila

USU Biology Department,
Lori Spears

In 2013, Utah State University surveyed for spotted wing drosophila (SWD; *Drosophila suzukii*) an insect that could devastate the eight different tree fruits and six different berries grown by at least 370 operations in Utah.

Twelve workshops were presented in high risk areas, focusing on Davis County and areas of high fruit production. The workshops educated growers and homeowners about SWD biology and management, with the main focus on monitoring (trapping) procedures. Workshops demonstrated how traps are made, and participants were given a trap and other useful monitoring tools to take home. Additionally, participants were given pocket sized SWD identification cards and handouts providing further information. 90% of participant submitting evaluations indicated that they were “very likely” to begin their own SWD monitoring programs.

In addition to the 2013 outreach, a survey for SWD focused on 28 sites in Davis County and 2 sites in Salt Lake County. Each trap used yeast/sugar bait. A total of 23 SWD were found all in Davis County. All *D. suzukii* samples were screened by Lori Spears and her lab technicians at Utah State University. In 2014, state agricultural officials are planning to continue surveys for this pest in commercial orchards areas.



ELIZABETH BEERS, WSU

Fig. 17 A female spotted wing drosophila oviposits on fruit.



ELIZABETH BEERS, WSU

Fig. 18 The female leaves behind a breathing tube for the eggs.



Early
Detection &
Rapid
Response

Velvet Longhorn Beetle

UDAF Plant Industry
USDA APHIS—PPQ
DHS USCIS

The Velvet Long Horn beetle (VLHB; *Trichoferus campestris*) was first discovered in North American in the province of Quebec, Canada in 2002. It was first detected in Utah at a trapping site in South Salt Lake City in July 2010.

The VLHB attacks healthy or slightly stressed trees of many important species. It prefers to attack mature trees, which results in tree death or causes significant loss of vigor. This damage results in a devaluation of host trees in urban settings, a loss of wood marketability (because of the boreholes) and reduced fruit yields in the case of orchards. Nevertheless, the relative importance of VLHB in damaging forest trees, trees in natural environments, orchard trees, and amenity trees has not been evaluated beyond the observation that the preferred hosts are fruit or amenity trees (*Malus* and *Morus*).

A survey for the VLHB and other exotic wood boring beetles was conducted in Utah in 2013. 48 Lindgren funnel traps were placed at 12 sites in Salt Lake, Box Elder, Utah and Davis County, which targeted stone and machinery importers, riparian corridors and fruit orchards. The lures used were ethanol, ethanol with alpha-pinene, and Ips tri-lure. In addition four light traps were used periodically for additional survey. From these traps 157 VLHB specimens were detected at nine different sites in Salt Lake and Utah Counties. State and federal agricultural officials plan to survey this area in 2014.



CARESSA PRATT, UDAF

Fig. 19 The VLHB's preferred hosts are apple (*Malus*) and mulberry (*Morus*) trees.



Invasive
Species
Habitat
Restoration

Weed Biological Control

USDA APHIS—PPQ
Utah Weed Supervisor Ass.,
Jerry Caldwell

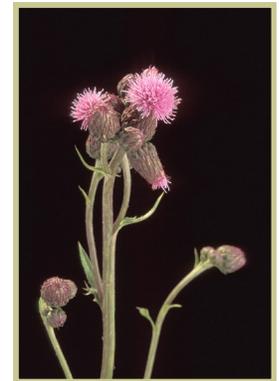
Noxious weeds are spreading at an alarming rate across the western United States, including Utah. Although the exact acreage is unknown, 100% of Utah's counties are severely infested by at least one of the state-designated 27 noxious weeds. The negative impacts of weeds are well known and profound. Noxious weeds can create monocultures that eliminate diverse plant communities. Watersheds dominated by noxious weeds tend to be less efficient in absorbing and storing water resulting in increased soil erosion. Noxious weeds can diminish forage production for all classes of herbivores and reduce habitat for small birds and animals. In addition, many noxious weeds are poisonous or injurious to animals.

The biological control of noxious weeds remains a cost effective and environmentally friendly method of preserving range habitat from invasive species. In 2013, the Utah Weed Supervisor Association received USDA funding. This funding was used to collect and distribute biological control agents to help restore critical habitat. Funds were also used for outreach including education about bio-control agents



UNCREDITED, USDA ARS

Fig. 20 Utah has 3 classes of noxious weeds. Leafy spurge is a "Class A" weed and is of very high priority for control.



PEGGY GREB, USDA ARS

Fig. 21 Canada thistle is a "Class C" noxious weed.



Early
Detection &
Rapid
Response

Wood Borer Survey

USDA FS Forest Health Protection
UDAF Plant Industry

Bark beetle damage is a conspicuous reality in the forests of the western United States. Several exotic species of wood borers have been detected throughout North America in the past decade. Some invasive species of wood borers have



E. RICHARD HOEBEKE, CORNELL UNIVERSITY

Fig. 22 An adult *Pityogenes sp.* specimen on a card point.

caused devastating tree mortality and subsequent loss of critical habitat. Exotic wood borers are being transported by the global movement of soft and hard-wood packing material. These materials are used by foreign exporters to transport commodities, such as glass, machinery, stone, tile, and plumbing fixtures. International efforts have succeeded in creating policy that requires the treatment of these materials, however, introductions of exotic wood borers continues to occur.

Invasive species survey is a critical component of the early detection and rapid response (EDRR) model used nationally. In 2013, the UDAF Plant Industry received Forest Service, Forest Health Protection funding to place traps that are designed to attract a variety of wood boring beetles. 60 Lindgren funnel traps were placed at 20 different sites in the Wasatch Mountain Range. The traps were baited with the following combination of lures: Ips complex lure, ethanol and a-pinene lures, and a-pinene lure. Approximately 18,000 individual specimens were identified to species, with no new exotic species detected.

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Utah Invasive Species

Web Resources

2013 Plant Industry Insect Report

<http://ag.utah.gov/documents/2013InsectReport.pdf>

Utah Plant Pest Diagnostics Lab

<http://utahpests.usu.edu/upddl/>

Utah Cooperative Agricultural Pest Survey

<http://utahpests.usu.edu/caps/>

Utah Horticultural Association

<http://www.utahhort.org/>

Honey Bee Resources

<http://bees.usu.edu>

Utah Weed Supervisors Association

<http://www.utahweed.org/>

Utah Nursery and Landscape Association

<http://www.utahgreen.org/>

UDAF Insect and Quarantine Program

<http://ag.utah.gov/plants-pests/insects.html>

Grazing Improvement Program

<http://ag.utah.gov/conservation-and-environmental/grazing-improvement.html>

Summary of Invasive and Native Pest Risks

Africanized Honey Bee	Potential to disrupt Utah's \$1.5 million honey industry, health risks to humans and livestock
Orchard Pests	Fruit industry pest, potential to devastate Utah's \$17 million fruit industry
Cereal Leaf Beetle	Potential to reduce Utah's \$715 million small grain and field crop industry
Emerald Ash Borer	Threaten to kill all ornamental and native ash trees in Utah
European Corn Borer	Potential to devastate Utah's \$69 million corn harvest
Gypsy Moth	Potential to destroy Utah's watersheds, coniferous forests, and residential landscapes
Japanese Beetle	Potential to damage Utah's \$128 million nursery and floriculture industry, and \$17 million fruit industry
Mormon Cricket and Grasshopper	Potential to significantly reduce Utah's \$715 million small grain and field crop industry
Red Imported Fire Ant	Economic damage caused in the US exceeds \$5 billion and a public health risk