2015 Insect Report

Utah Department of Agriculture and Food

PLANT INDUSTRY & CONSERVATION

2015 UDAF Insect Report

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National Plant Board

USU Plant Pest Diagnostic Lab

Utah Nursery and Landscape Association

DHS United States Citizenship and Immigration Services

UTAH FRUIT GROWERS

UTAH WEED SUPERVISORS ASSOCIATION

USDA CENTER FOR PLANT HEALTH SCIENCE AND TECHNOLOGY

UDAF Plant Industry thanks all of our partners as well as the following entomologists:

Ryan Davis	Steve Munson	Lori Spears	Dawn Holzer
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COVER PHOTO BY USDA APHIS

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 and Conservation 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 and Conservation 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. 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 and Conservation 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 and Conservation 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 (AHB) 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. These bees will follow people or animals a much further distance from the hive and may sting thousands of times per attack. Though these bees are dangerous, they have 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.

JEFFREY W LOTZ, FLORIDA DEPARTMENT OF AGRICULTURE

Fig. 1 It is difficult to distinguish Africanized (pictured) and European honey bees visually.

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.

Since the initial 2008 detection, UDAF Plant Industry and Conservation has been working with beekeepers and scientists to track the movement of AHB in the state. In 2015 48 AHB traps were set in eight southern Utah counties. None of these traps caught any swarms in 2015. However samples collected from feral colonies which were sent to the University of Arkansas Agricultural Experiment Station revealed that Africanized genetics were present in two counties previously thought to be free of AHB: Grand and Wayne counties. 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.

Apiary Program

UDAF Plant Industry

KRIS WATSON, UDAF

Fig. 2 State inspections discovered three cases of American foulbrood in 2015.

Utah, the "Beehive State", produces around a million pounds of honey each year. Honey bees are key pollinators of many crops grown throughout the state—from large-scale orchards and farms to backyard fruit trees and gardens. Utah's bees are also important to agriculture nationwide, as most of the state's commercial beekeepers move their hives to other states for pollination services.

The numerous diseases, parasites and other maladies that affect these colonies are important concerns for UDAF Plant Industry and Conservation. The Apiary Program has been active in protecting these managed colonies by conducting health inspections, disease testing and education regarding malady management. The combined efforts of state apiary specialists and county bee inspectors resulted in thousands of hives surveyed. These inspections revealed three cases of the most devastating honey bee disease, American foulbrood (AFB). The infections were found in Davis, Salt Lake and Weber counties. UDAF Plant Industry and Conservation contained these cases by working with beekeepers to treat or destroy infected colonies.

In 2015 the Apiary Program also partnered with the UDAF Pesticide Program to create the state's first Managed Pollinator Protection Plan (MP3). Various stakeholders were involved in the creation of this plan along with Best Management Practices (BMPs) for pesticide applicators, beekeepers and landowners. Highlights of the MP3 include improved training of pesticide applicators, promoting integrated pest management in beekeeping and partnering with other institutions to enhance pollinator forage.

Fruit Industry

Apple Maggot & Cherry Fruit Fly

Utah Fruit Growers
UDAF Plant Industry

JOSEPH BERGER, BUGWOOD.ORG

Fig. 3 The apple maggot has a distinct patern on the wings.

H.J. LARSEN, BUGWOOD.ORG

Fig. 4 Damage to inside of fruit caused by the apple maggot.

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 and Conservation program began in 1985 with the discovery of apple maggot in abandoned and non-commercial cherry orchards in Utah County. In 2015, 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 $34 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

GYORGY CSOKA, HUNGARY FOREST RESEARCH INSTITUTE

Fig. 5 The pine-tree lappet (*Dendrolimus pini*) is a serious forest pest. Pictured is the larvae.

STANISLAW KINELSKI, UGA

Fig. 6 Pine-tree lappet adult.

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 have a large host range that includes all species of conifer and hardwood trees found throughout the state. If introduced, 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 and Conservation 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 2015, 800 traps were deployed to detect adults of these species with negative results for all species.

Fruit Industry

Brown Marmorated Stink Bug

USU Department of Biology, UDAF Plant Industry

SUSAN ELLIS, BUGWOOD.ORG

Fig. 7 Statewide trapping efforts detected BMSB in two new counties this year.

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 and is now reported in 42 states, 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 vegetables, 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.

Several outreach events and workshops were conducted in Cache, Box Elder, Davis, Salt Lake and Utah counties, and focused on educating growers and homeowners about BMSB biology, monitoring, identification and best management practices.

In addition, surveys for BMSB took place in 2015 in northern Utah. 56 BMSB traps were monitored in seven counties from April through October. Trapping locations included commercial orchards, urban settings, and community gardens (multiple vegetable crops). BMSB adults were found on honeysuckle (*Lonicera spp*.), Amur maple (*Acer ginnala*), Siberian peashrub (*Caragana arborescens*), catalpa (*Capalta spp*.) and butterfly bush. Through cooperative efforts hundreds of adult BMSBs were found in Salt Lake and Utah counties including two new county records in Davis and Weber counties. For the first time nymphs and egg masses were also discovered in Utah during the 2015 survey. No BMSBs have been found in commercial orchards. In 2016, State agricultural officials will continue to survey for this pest throughout northern Utah.

Urban Habitat Protection

Emerald Ash Borer

USDA APHIS PPQ
USU Department of Biology

DEBBIE MILLER, USDA FOREST SERVICE

Fig. 8 Gradual maturation of emerald ash borer: prepupae on far left and adult on far right.

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 and logs (especially fire-wood). In its native ecosystem, 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 of infestation begin with crown dieback, which is followed by epicormic shoots, splitting bark, increased woodpecker damage, serpentine galleries, and D-shaped exit holes. These symptoms progress until the tree is dead.

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 2015, APHIS PPQ placed 105 baited traps throughout eight counties, targeting high-risk ash trees that exhibited symptoms associated with unhealthy or declining trees. No EAB were detected from these efforts.

Crop Protection Export Program

European Corn Borer

UDAF Plant Industry

ADAM SISSON, IOWA STATE UNIVERSITY, BUGWOOD.ORG

Fig. 9 The larval form of the European corn borer has a pinkish tan body.

FRANK PEAIRS, COLORADO STATE UNIVERSITY

Fig. 10 The adult female has a thick body and light colored wings.

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 and Conservation 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 and Conservation also coordinates a European corn borer trapping program. This program consists of 101 traps placed in chief corn producing areas including 20 counties. No new records of the European corn borer were found in Utah in 2015.

Invasive Species Early Detection

European Grapevine Moth

UDAF Plant Industry

JACK KELLY CLARK, UC DAVIS IPM

Fig. 11 Early stage larvae are tan or brown; late stage larvae are darker.

JACK KELLY CLARK, UC DAVIS IPM

Fig. 12 The adult moth has a mosaic pattern on the wings.

First found in California vineyards in 2009, European Grapevine Moth (EGVM; *Lobesia botrana*) is native to southern Italy and causes significant economic damage. As its name suggests it is a pest of grapes (*Vitis vinifera*), however it also feeds on blackberry (*Rubus fruticosus*), gooseberry (*Ribes sp.*), cherry (*Prunus avium*), prunes (*Prunus domestica*), carnations (*Dianthus spp.*) and many other plants.

The first generation larvae feed on the flower buds and flower clusters. Subsequent generations feed on the fruit, leaving only seeds and skin. Webbing and frass are found on host plants. Feeding damage often leads to Botyrtis infections as well as other secondary diseases. Obvious signs of infestation include grapes that turn brown or rot, webbing on inflorescences and the presence of larvae on host plants.

UDAF Plant Industry and Conservation is committed to preventing the entrance and establishment of this pest. In 2015 traps were set at 16 site in two counties; no EGVM were detected.

Invasive Species Early Detection

Gypsy Moth

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

USDA APHIS PPQ

Fig. 13 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; this is capable of causing widespread negative impacts on Utah's landscapes. Utah is not part of the contiguous range of GM populations in the Eastern U.S. Therefore GM early detection and, if necessary, 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 and Conservation has successfully eradicated introduced GM populations twice using the bacterium *Bacillus thuringiensis* var. *kurstaki (Btk)* and annually monitors for new introductions. The 2015, Utah Gypsy Moth Program placed 1,907 detection traps using the GMWest model BioSIM to determine areas of highest risk of introduction and establishment. This model integrates climate and elevation data to predict the probability of GM establishment. From 2000 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 2008.

Early Detection & Eradication

Japanese Beetle

UDAF Plant Industry
USDA APHIS—PPQ

SUSAN ELLIS, BUGWOOD.ORG

Fig. 14 Two Japanese beetles were found in the Avenues area of Salt Lake City in 2015.

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 $167 million nursery and floriculture economy and has been part of UDAF Plant Industry and Conservation'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 allowed the treatment area to shrink over consecutive years and no treatments were conducted in the past three years. With two years of negative catches in the Orem area, UDAF declared eradication of the Utah County JB population in fall of 2014.

However the ongoing threat of JB continues, in 2014 two solitary male beetles were found in Salt Lake County at separate locations and in 2015 one male and one female beetle was found in the Avenues area of Salt Lake City. Continued high density delimiting trapping will be conducted in the area during 2016 to help guide any treatments if found necessary. In 2016 attention will focus on the nursery plant trade 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

HOWARD ENSIGN EVANS, COLORADO STATE UNIVERSITY

Fig. 15 Mormon crickets are flightless, yet can travel long distances in a single day by crawling.

For the past decade, disaster declarations by the governor have focused resources (administered through UDAF Plant Industry and Conservation) to provide relief from major infestations of Mormon crickets (*Anbrus 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 and Conservation grasshopper and Mormon cricket program is to facilitate biologically sensitive and effective suppression programs before widespread damage occurs. In 2015 a total of 210,687 acres were infested; cost share programs were approved in six counties for 21 participants. Elements that have contributed to successful control of rangeland pest are: Available funding, collaboration with all affected stakeholders, and accurate survey data.

In 2015, no treatment programs were conducted on behalf the department. However UDAF Plant Industry and Conservation did share the cost of treatments with farmers and ranchers for infestations of grasshoppers on private land. The cost share program is an ongoing effort to support farmers and ranchers ability to suppress rangeland pests from damaging crops.

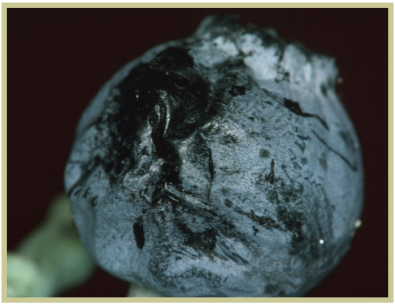
Fruit Industry Export Program

Plum Curculio

Utah State University
Utah Fruit Growers
UDAF Plant Industry

JERRY A. PAYNE, USDA ARS

Fig. 16 Both the larval and adult stage of this pest cause damage.



JERRY A. PAYNE, USDA ARS

Fig. 17 Blueberry fruit that was damaged by plum curculio.

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 backyard fruit trees in Brigham City.

The presence of plum curculio in Brigham City is sustained by unmanaged fruit trees located in residential areas. Unmanaged fruit trees serve as a reservoir for populations of this insect. Each year Utah State University and UDAF Plant Industry and Conservation, 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's fruit orchard survey consists of 16 sentinel sites in Box Elder, Davis and Utah 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 late October in 2015. 12 plum curculios were detected in six different locations in Box Elder County. No plum curculios were detected in Davis and Utah counties.

Public Health & Nuisance

Red Imported Fire Ant

USDA APHIS—PPQ
USU Department of Biology

Imported fire ants are both a public health risk and an economic threat. They were first introduced to the southern U.S. in the 1930s from South America. They are federally quarantined pests not known to occur in Utah, but can be easily introduced in infested soil.

ELI SARNAT, USDA APHIS

Fig. 18 RIFA can easily be transported in soil, baled hay, baled straw, plants, sod and beehives.

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 and Conservation 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.

Utah State University sampled 27 sites in 2015. During this survey, neither RIFA nor BIFA was detected at any of the sites. However native *Solenopsis* species, *S. xyloni*, has been 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

MARTIN HAUSER, UC DAVIS IPM

Fig. 19 The adult male fly has black spots on the wing tips.

LARRY L. STRAND, UC DAVIS IPM

Fig. 20 A cherry with a pupating spotted wing drosophila.

Utah's fruit industry is valued at $34 million and occurs on approximately 6,500 acres. In 2015, Utah State University surveyed for spotted wing drosophila (SWD; *Drosophila suzukii*) which could devastate the eight different tree fruits and six different berries grown by at least 370 operations in Utah.

Several outreach events and workshops were conducted in Cache, Box Elder, Davis, Salt Lake and Utah counties, and focused on educating growers and homeowners about SWD biology, monitoring, identification and best management practices.

In addition to these outreach efforts, a survey for SWD was carried out at 135 sites in Box Elder, Cache, Davis, Rich, Utah and Weber counties. Thousands of SWD were found in 2015, with the highest counts being in Cache County, although this pest was found in all counties surveyed.

All SWD samples were screened by Lori Spears and her lab technicians at Utah State University. In 2016, state agricultural officials will continue surveys for this pest in high fruit production and commercial orchards areas.

Early Detection & Rapid Response

Velvet Longhorn Beetle

UDAF Plant Industry
USDA APHIS—PPQ
DHS USCIS

CHRISTOPHER PIERCE, USDA APHIS

Fig. 21 This insect is native to Russia and Asia.

The velvet longhorn beetle (VLB; *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 VLB 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/or reduced fruit yields in the case of orchards. Nevertheless, the relative importance of VLB 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*).

Continued survey for the VLB was conducted in Utah in 2015. 100 cross vane panel traps were placed at two sites in Salt Lake and Utah County, which targeted the known epicenters of VLB in Utah at a golf course and orchard. In addition three light traps were used periodically for additional survey to collect live specimens for additional pheromone research. Specimens were also caught in the 60 Lindgren Funnel traps set across the state. From all of these traps 1,782 VLB specimens were detected at the two sites in Salt Lake and Utah counties. Credited to our cross training a single VLB was detected in Davis County for a new county record. State and Federal agricultural officials plan to continue survey in 2016, to help further the understanding of the biology and risk of this invasive pest.

Invasive Species Habitat Restoration

Weed Biological Control

USDA APHIS—PPQ
Utah Weed Supervisor Ass.,

ROB ROUTLEDGE, SAULT COLLEGE

Fig. 22 Utah has three classes of noxious weeds. Spotted knapweed is a "Class A" weed and is of high priority.

MARY ELLEN HARTE BUGWOOD.ORG

Fig. 23 Morning glory is a "Class C" noxious weed.

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 2015 UDAF Plant Industry and Conservation and Utah Weed Supervisor Association conducted outreach education about bio-control agents in conjunction with collecting and distributing biological control agents to help restore critical habitat.

Early Detection & Rapid Response

Wood Borer Survey

USDA FS Forest Health Protection
UDAF Plant Industry

RON LONG, SIMON FRASER UNIVERSITY

Fig. 24 Ips beetles (*Ips latidens*—pictured) typically attack weak trees but can devastate live trees under certain conditions.

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 caused devastating tree mortality and subsequent loss of critical habitat. Exotic wood borers are being transported by the global movement of soft and hardwood 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 2015, the UDAF Plant Industry and Conservation received 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 along the Wasatch front. The traps were baited with the following combination of lures: Ips complex lure, ethanol and a-pinene lures, and a-pinene lure. Approximately 13,000 individual specimens were identified to species, with no new exotic species detected.

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Utah Agriculture Web Resources

2015 Plant Industry and Conservation Insect Report
http://ag.utah.gov/documents/2015InsectReport.pdf

Utah Plant Pest Diagnostics Lab
http://utahpests.usu.edu/uppdl/

Utah Cooperative Agricultural Pest Survey
http://utahpests.usu.edu/caps/

Utah Horticultural Association
http://www.utahhort.org/

Honey Bee Resources
http://ag.utah.gov/plants-pests/beekeeping.html

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://www.ag.utah.gov/animals.html?id=273:grazing-improvement&catid=64

Summary of Invasive and Native Pest Risks

Asian Defoliators	Significant potential threat to Utah's forests and related industries
Emerald Ash Borer	Threaten to kill all ornamental and native ash trees in Utah
European Corn Borer	Potential to devastate Utah's $25 million corn harvest
Gypsy Moth	Potential to disrupt Utah's $2 million honey industry; health risks to humans and livestock
Honey Bee Pests and Diseases	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 $34 million fruit industry
Mormon Cricket and Grasshopper	Potential to significantly reduce Utah's $509 million small grain and field crop industry
Orchard Pests	Fruit industry pest, potential to devastate Utah's $34 million fruit industry
Red Imported Fire Ant	Economic damage caused in the US exceeds $5 billion and a public health risk