First Detector Training



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Invasive Species Survey Specialist

UTAH PESTS

UtahStateUniversity
DEPARTMENT OF BIOLOGY

EXTENSION
UtahStateUniversity

FIRST DETECTOR WORKSHOP 2021

September 30, 9:00am - 3:00pm

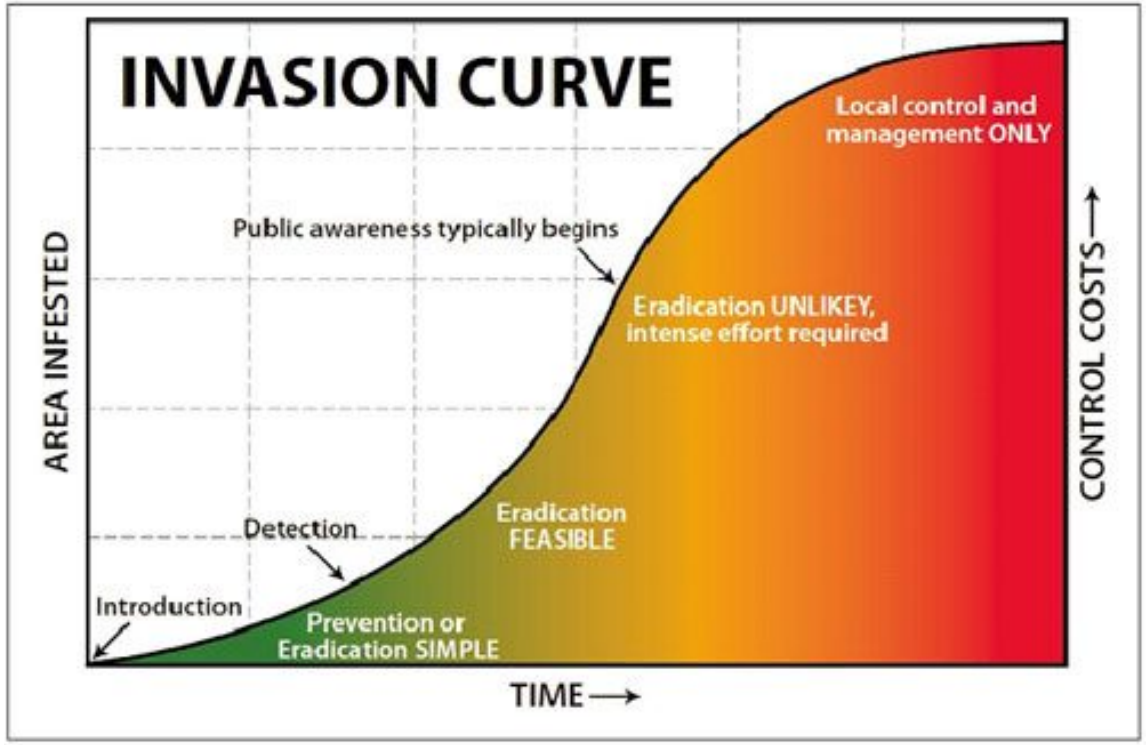
AGENDA

9:00	**Welcome**, Lori Spears, USU
9:15	**Partner Agencies and their Roles**, Dawn Holzer, USDA APHIS PPQ
9:45	**Asian Giant Hornet**, Zach Schumm, USU
10:15	**BREAK**
10:30	**Spotted Lanternfly**, Lori Spears, USU
11:00	**Japanese Beetle and Emerald Ash Borer**, Joey Caputo, UDAF
12:00	**LUNCH**
1:00	**Brown Marmorated Stink Bug**, Kate Richardson, USU Graduate Student
1:20	**Balsam Woolly Adelgid**, Liz Rideout, USU Graduate Student
1:45	**Beneficials in the Garden**, Mair Murray, USU
2:30	**Native Bees**, Sheriden Hansen, USU

Powerpoint slides will be made available at **https://extension.usu.edu/pests/caps/**

What is an Invasive Species?

- A non-native species that harms the economy, environment or human health.
- The term “invasive” is reserved for the most aggressive and destructive non-native species.
- Are introduced to new areas accidentally or intentionally; some spread naturally



Invasive insects and diseases are a major threat to agriculture and natural ecosystems

- Invasive species cost the U.S. > $120 billion per year
- National surveys are coordinated by **USDA APHIS PPQ** via the **Cooperative Agricultural Pest Survey** program
- Located in all 50 states and 3 territories
- The Utah CAPS Program is cooperatively administered by **USU** and **UDAF**

Objective

Safeguard U.S. agricultural and environmental resources by ensuring that new introductions of harmful plant pests and diseases are detected as soon as possible.

Surveys

Research

Outreach

Utah's First Detector Program is a response to the constant and growing threat of invasive species

First detected in Utah by a Master Gardener

…and the list goes on and on

First detected in Utah by a Master Gardener

…and the list goes on and on

…and the list goes on and on

…and the list goes on and on

…and the list goes on and on

Waiting in the wings…

Waiting in the wings…

Waiting in the wings…


we
need
you

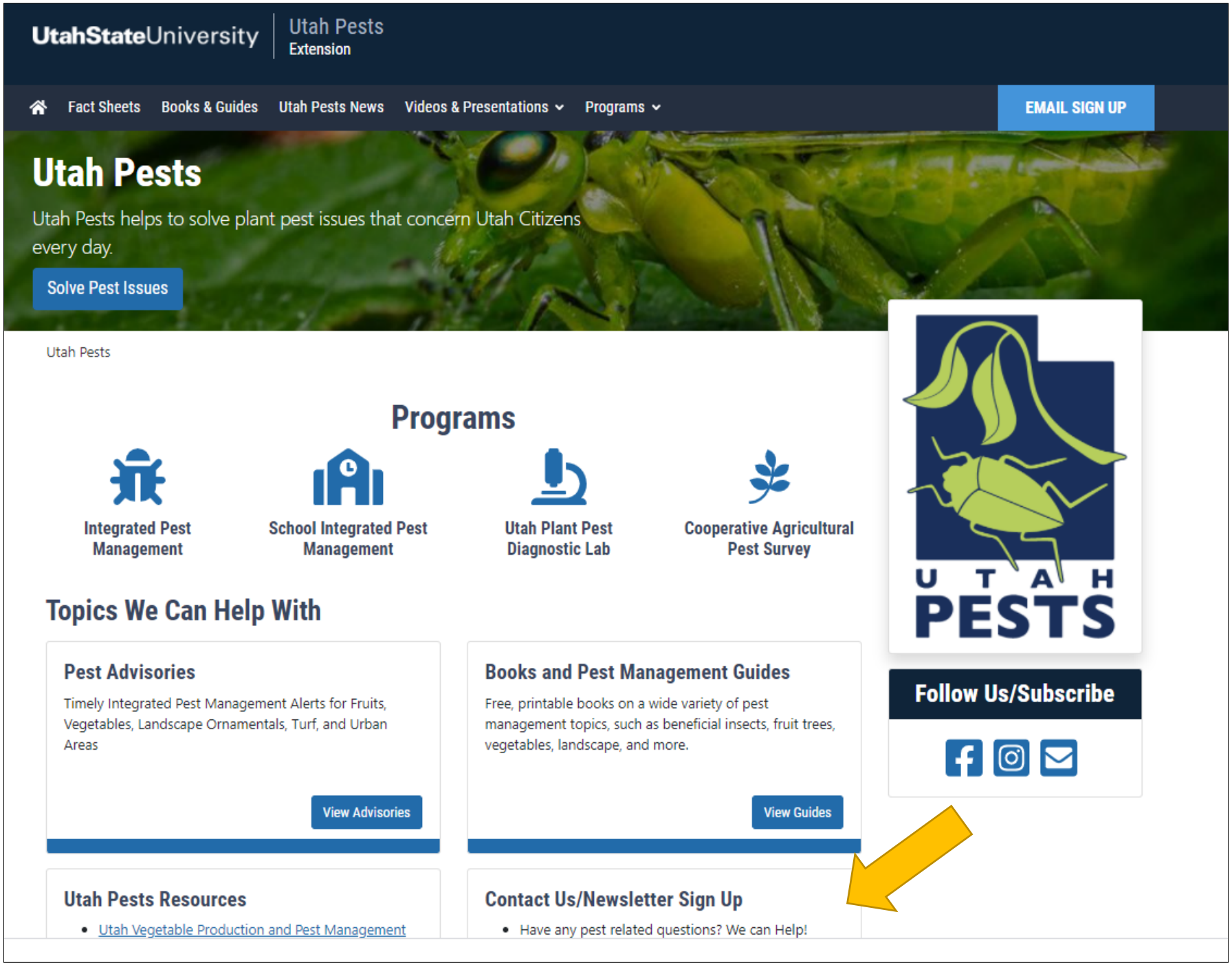
First Detector Responsibilities

- First Detectors never announce the arrival of a new pest.
- All information regarding potentially new, invasive pests must be treated as confidential.
- This protocol is required to avoid premature and incorrect reports.
- Notify USU Extension, the Utah Plant Pest Diagnostic Lab, or Utah Department of Agriculture and Food

Invasive beetle not yet confirmed in Utah, but tree care companies beg to differ

CARTER MOORE on October 15, 2018 at 12:00 pm

Some tree care companies believe a tree-munching insect called the emerald ash borer has already begun its attack in Utah, but researchers worry there is premature panic about its arrival.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ROLES & RESPONSIBILITIES

In order to become a First Detector, individuals must attend a First Detector training workshop, which is usually held in September (see https://utahpests.usu.edu/caps/get-involved for more information). In addition, First Detectors must be familiar with and agree to the following terms:

- *First Detectors never announce the arrival of a new pest.* All information regarding potentially new, invasive pests must be treated as confidential. First Detectors should immediately notify the UPPDL regarding suspected symptoms or collection of life stages. The UPPDL will then communicate that information to the appropriate agencies. This protocol is required to avoid premature and incorrect reports, as significant unintended consequences may result from hasty, inaccurate communications.
- *First Detectors do not have the authority to enter private property without permission.* If you do receive permission to enter private property, it is recommended that the property owner accompany you.
- *Being a First Detector is voluntary.* First Detectors will not be financially compensated or reimbursed for time and/or travel. However, continuing education units (CEUs) may be available for pesticide applicators and certified arborists. Master Gardeners may also be able to use First Detector volunteer hours toward Master Gardener service hours, but should first discuss this opportunity with their county Extension agent.

SUBMITTING SAMPLES

The UPPDL is a service of USU Extension and the Department of Biology at USU. The UPPDL is staffed with highly skilled and experienced professionals that provide rapid and accurate identification of pest-related problems. First Detectors may submit suspect samples (digital images and/or physical samples) directly to the UPPDL. If possible, send digital images to caps@usu.edu or utahpestlab@gmail.com for screening prior to submitting physical samples to the UPPDL.

Submitting Digital Images

Send high-resolution images as an email attachment to one of the labs listed on the next page. Images should be **in focus** and well-lighted, contain a ruler or other object for scale, and contain different parts/views of the insect and/or plant symptoms.

Submitting Physical Samples

Live insects can escape from containers; therefore, it is very important that you kill (do not squish) the insect before submitting it to the UPPDL. Place the insect into a spill-proof jar or vial containing rubbing alcohol (hand sanitizer or white vinegar are suitable alternatives). You can also freeze the insect before placing it into a sealable crush-proof container. If submitting plant material, handle it as if it contains a live pest (i.e., secure plant material so that an emerging pest could not escape). Wrap plant material in paper bags or newspaper. Secure samples using packing material to avoid breakage/damage. Samples containing plant material should be sent overnight.

Include with your submission, the date, collection location, email address, phone number, and physical address in case we have follow-up questions. Mail sample(s) to one of the labs listed below, and as soon as possible to prevent drying or deterioration of the insect or plant material.

Utah Plant Pest Diagnostic Laboratory
Utah State University
5305 Old Main Hill
Logan, UT 84322-5305
Phone: 435-797-2435
Email: caps@usu.edu or utahpestlab@gmail.com
Website: http://utahpests.usu.edu/uppdl/

Utah Department of Agriculture and Food
Plant Industry and Conservation Division
350 N. Redwood Road
Salt Lake City, UT 84114
Phone: 801-538-7184
Email: agriculture@utah.gov
Website: http://ag.utah.gov/plants-pests.html

Acknowledgments: Many thanks to Dawn Holzer and Alana Wild (both of USDA APHIS PPQ) for supporting and recognizing the need for this work. Funding was provided by USDA APHIS PPQ. The Utah First Detector Program is modeled after the Minnesota, Vermont, and North Dakota First Detector Programs.

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Utah Pests helps to solve plant pest issues that concern Utah Citizens every day.

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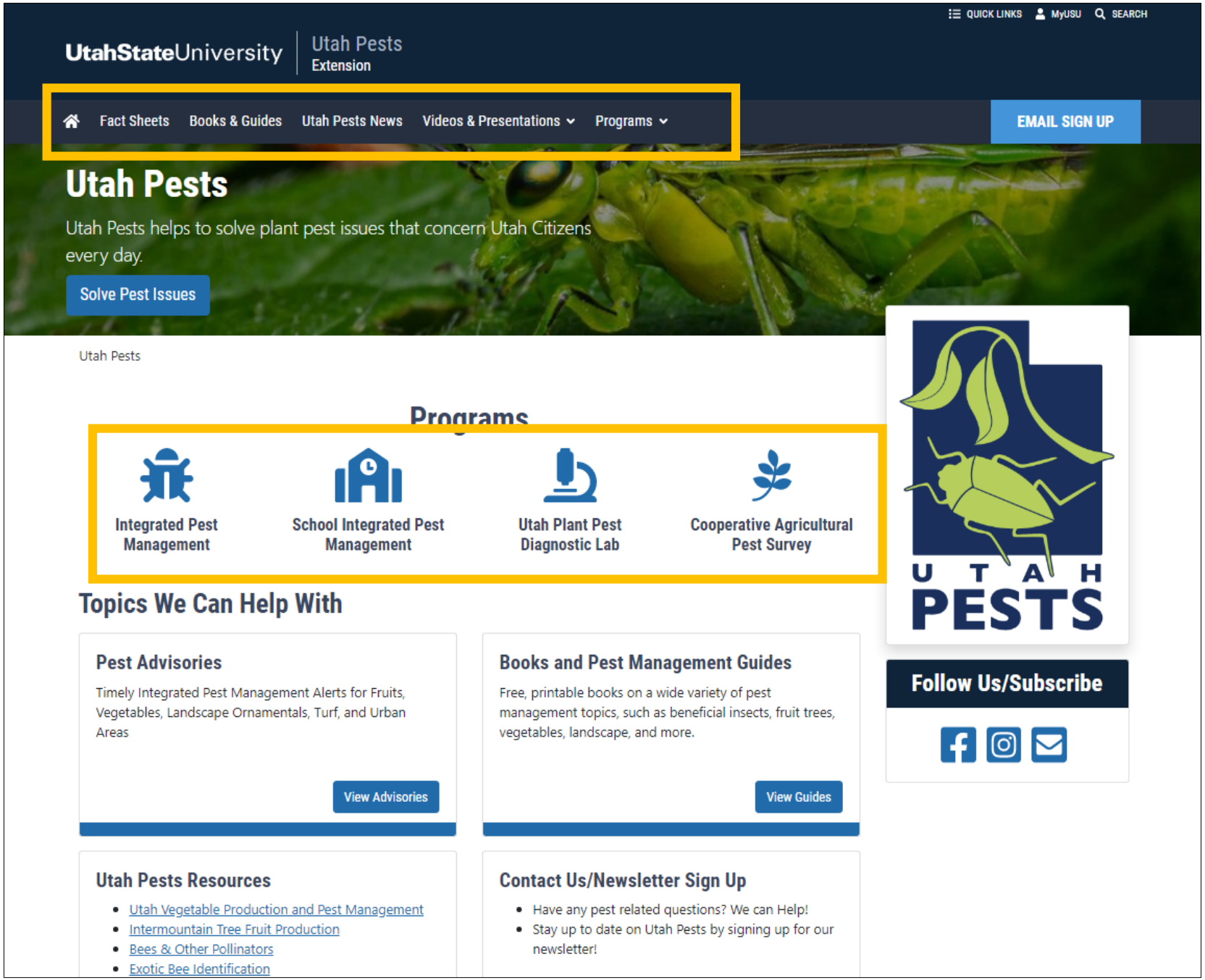
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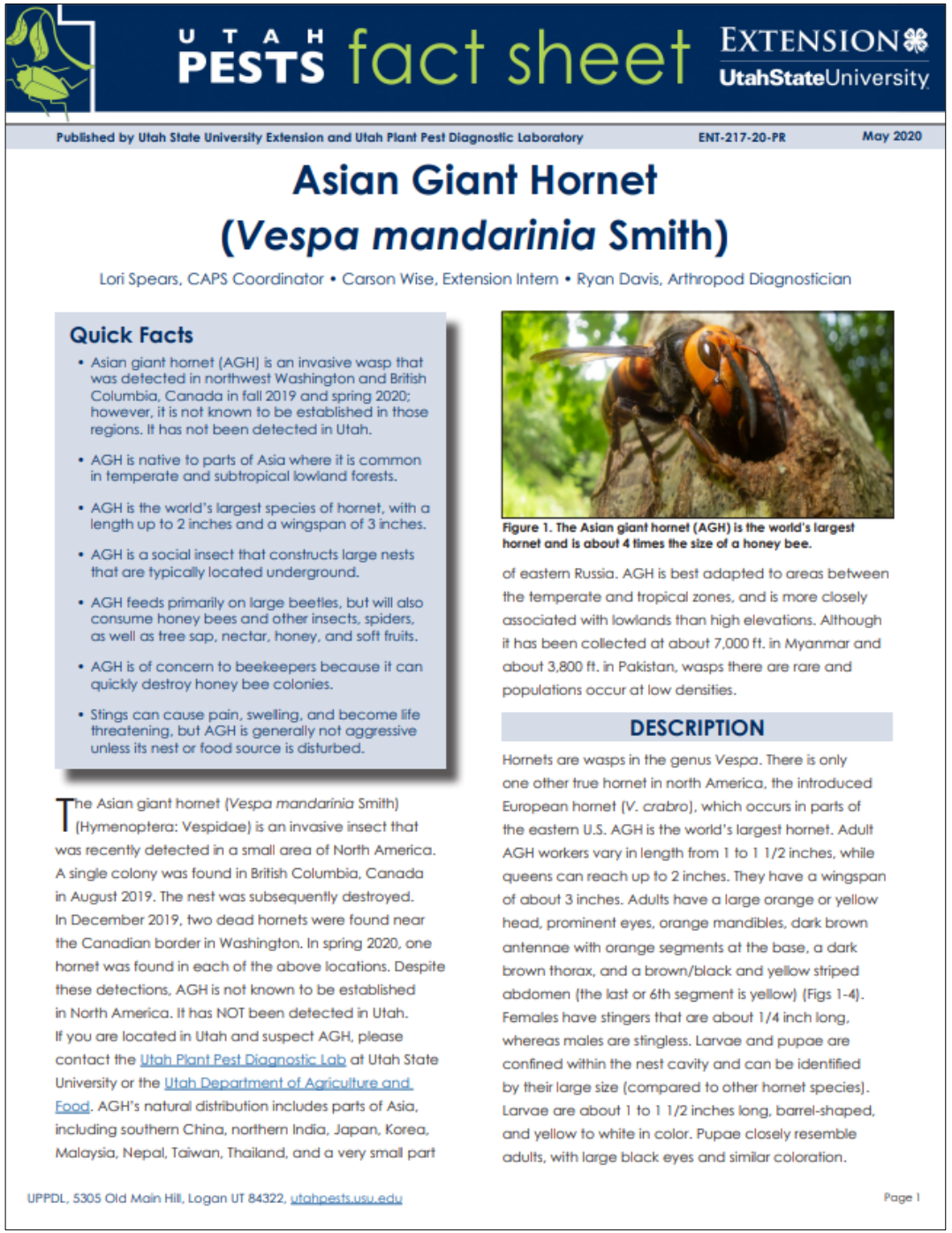

UTAH PESTS fact sheet
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Asian Giant Hornet (*Vespa mandarinia* Smith)

Lori Spears, CAPS Coordinator • Carson Wise, Extension Intern • Ryan Davis, Arthropod Diagnostician

Quick Facts

- Asian giant hornet (AGH) is an invasive wasp that was detected in northwest Washington and British Columbia, Canada in fall 2019 and spring 2020; however, it is not known to be established in those regions. It has not been detected in Utah.
- AGH is native to parts of Asia where it is common in temperate and subtropical lowland forests.
- AGH is the world's largest species of hornet, with a length up to 2 inches and a wingspan of 3 inches.
- AGH is a social insect that constructs large nests that are typically located underground.
- AGH feeds primarily on large beetles, but will also consume honey bees and other insects, spiders, as well as tree sap, nectar, honey, and soft fruits.
- AGH is of concern to beekeepers because it can quickly destroy honey bee colonies.
- Stings can cause pain, swelling, and become life threatening, but AGH is generally not aggressive unless its nest or food source is disturbed.

The Asian giant hornet (*Vespa mandarinia* Smith) (Hymenoptera: Vespidae) is an invasive insect that was recently detected in a small area of North America. A single colony was found in British Columbia, Canada in August 2019. The nest was subsequently destroyed. In December 2019, two dead hornets were found near the Canadian border in Washington. In spring 2020, one hornet was found in each of the above locations. Despite these detections, AGH is not known to be established in North America. It has NOT been detected in Utah. If you are located in Utah and suspect AGH, please contact the Utah Plant Pest Diagnostic Lab at Utah State University or the Utah Department of Agriculture and Food. AGH's natural distribution includes parts of Asia, including southern China, northern India, Japan, Korea, Malaysia, Nepal, Taiwan, Thailand, and a very small part

Figure 1. The Asian giant hornet (AGH) is the world's largest hornet and is about 4 times the size of a honey bee.

of eastern Russia. AGH is best adapted to areas between the temperate and tropical zones, and is more closely associated with lowlands than high elevations. Although it has been collected at about 7,000 ft. in Myanmar and about 3,800 ft. in Pakistan, wasps there are rare and populations occur at low densities.

DESCRIPTION

Hornets are wasps in the genus *Vespa*. There is only one other true hornet in north America, the introduced European hornet (*V. crabro*), which occurs in parts of the eastern U.S. AGH is the world's largest hornet. Adult AGH workers vary in length from 1 to 1 1/2 inches, while queens can reach up to 2 inches. They have a wingspan of about 3 inches. Adults have a large orange or yellow head, prominent eyes, orange mandibles, dark brown antennae with orange segments at the base, a dark brown thorax, and a brown/black and yellow striped abdomen (the last or 6th segment is yellow) (Figs 1-4). Females have stingers that are about 1/4 inch long, whereas males are stingless. Larvae and pupae are confined within the nest cavity and can be identified by their large size (compared to other hornet species). Larvae are about 1 to 1 1/2 inches long, barrel-shaped, and yellow to white in color. Pupae closely resemble adults, with large black eyes and similar coloration.

> 250 fact sheets

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NEWSLETTER

Winter 2019
Vol. XIII

Utah Plant Pest Diagnostic Laboratory

USU Extension

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Incorporating Insect Fear in Integrated Pest Management

Processionary weevil larvae preemptively form a circular grouping to defend against predators, such as this predatory stink bug.

Predatory insects and parasitoids provide natural pest control by directly feeding on pests. An overlooked aspect of these beneficial insects that has gained attention in pest management is that they do not necessarily need to eat a pest to have an impact.

In the face of a predator, your behavior changes, whether it is an intense feeling to want to flee, freeze in place, or just crap yourself. It turns out that predators affect rodent prey even when they are not present, as their urine provides enough of a cue for rodents to scurry and hide. In agriculture, the threat of predation on insects is an emerging area being recognized as a component of biological control, given that threats, or "fear," can reduce pest damage to plants.

Pest insects detect predators by seeing them, identifying specific odors, and sensing vibrations from movement or sound. Pest responses toward predators vary widely but can involve changes in pest behavior.

In a recent article in the journal *Biological Control*, Dr. Madeleine Dupuy, former USU biology graduate student, determined to what extent predatory ground beetles and wolf spiders fed on various billbug life stages in turfgrass, and how these predators impacted billbug behavior. Despite evidence that predatory ground beetles and spiders are capable of feeding on a variety of pest species, these predators posed little risk

continued on next page

Can fear behavior result in less plant damage? Research has shown that predator-avoidance behaviors can have major implications for the insect pests' fitness, and these effects can be just as strong as the direct consumption of pests.

- Colorado potato beetles that were exposed to damsel bugs and other predators flail their front legs, regurgitate, walk away, and defecate. All of these behaviors detract the beetles from feeding on the plants.
- Pea aphids that were exposed to predators dropped from plants, exposing them to other mortality factors, and also increased the number of wing-formed offspring, as compared to aphids not exposed to predators.
- Japanese beetles placed on leaves containing spider silk reduced their feeding as compared to beetles on untreated leaves or on leaves treated with other natural and artificial fibers.

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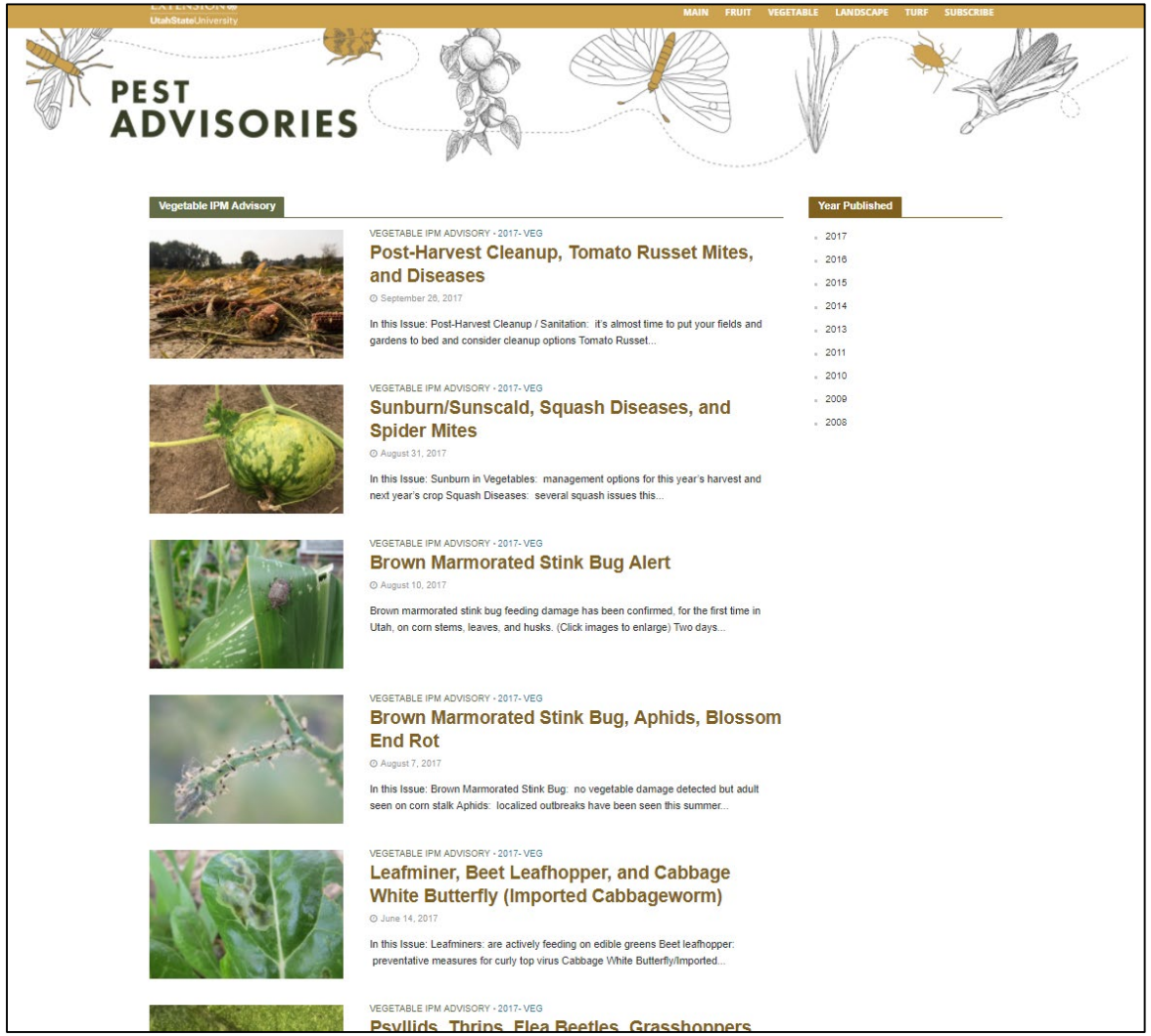

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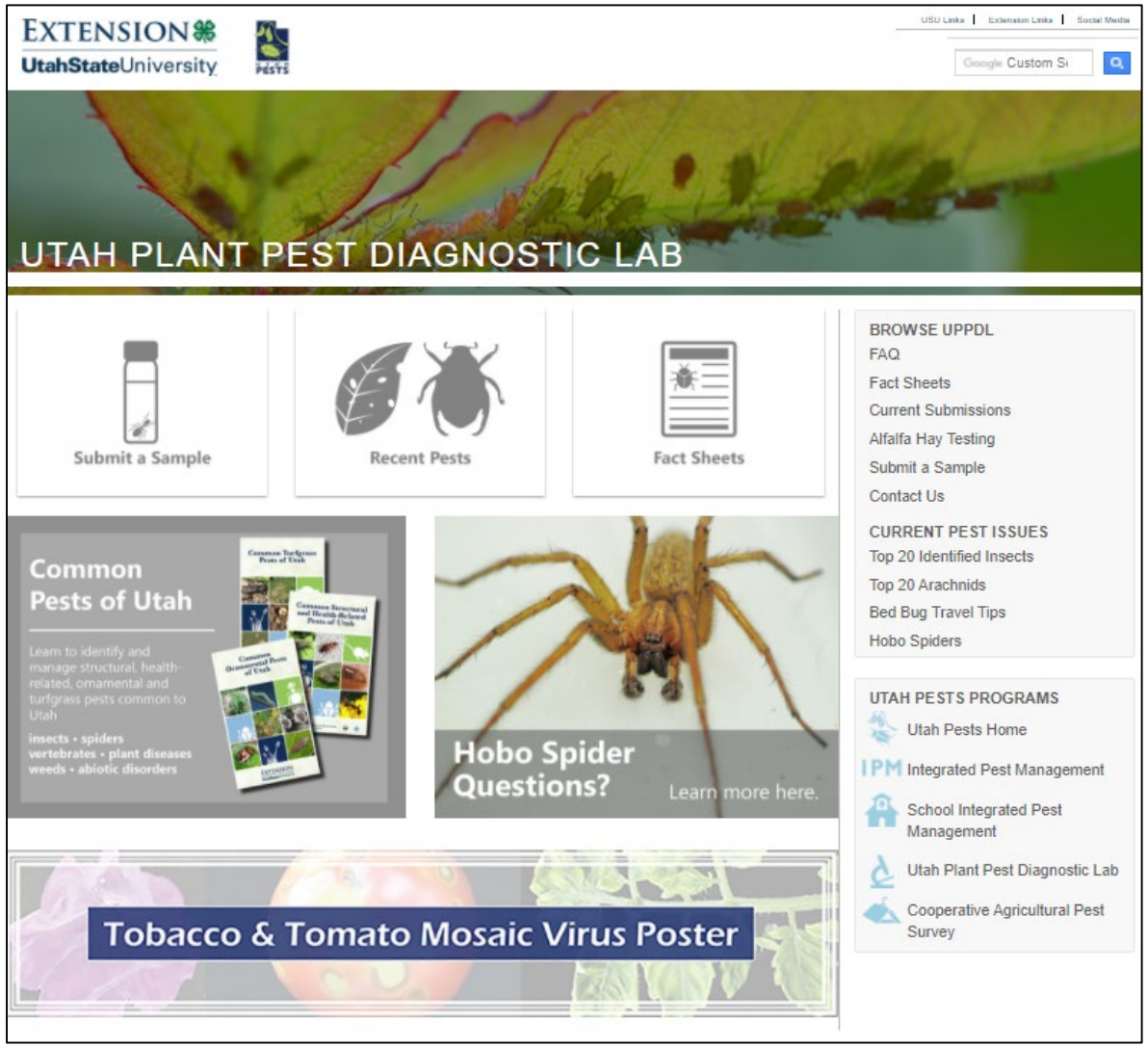

- Utah Plant Pest Diagnostic Lab; uppdl.usu.edu
- $10 basic services (diagnosis)
  - Visual/microscopic examination
  - Management recommendations
- $15 basic + disease culturing
- $30 basic + DNA or virus testing


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?