Landscape Insect Pests of Concern: Tree Borers, Nuisance Pests, and Invasives

Diane Alston, Entomologist, Utah State University

UtahState University

Topics

- Tree Borers
  - Pitch moths
  - White pine weevil
  - Locust borer
- Invasive Nuisance Insects
  - Elm seed bug
  - Red fire bug
  - Brown marmorated stink bug
- High Alert Potential Invasive
  - Emerald ash borer

Tree Borers Submitted to the Utah Plant Pest Diagnostic Lab in 2014

Pitch Borers

Pitch Mass Borer - Moth

Dioryctria spp. (Lepidoptera: Pyralidae)

Hosts: Pines (Austrian, Scots, Ponderosa, Lodgepole, Pinyon), occasionally Douglas Fir and true firs

Attacks weakened trees

Large, oozing masses of pitch caused by larvae feeding beneath the bark

Moths lay eggs in bark crevices near pitch masses

Larvae actively feed in late summer, can spend up to two years feeding on the resin

Boring larvae damage the tree's water conducting vessels

Pitch Borers

Management

Keep trees healthy, avoid stress, avoid summer pruning when moths lay eggs

Manually remove pitch masses, crush caterpillars, and allow wounds to heal

Preventive bark sprays
Late June through August for at least two years
bifenthrin, cyfluthrin, and carbaryl

Insecticides will not kill larvae under the bark, require several years to suppress

White Pine Weevil

Weevil: small beetle with a snout

Attacks terminal leaders of blue spruce trees in Utah (rarely attack pine in the West)

'Shepherd's crook', needle drop

Stunted growth, bushy growth with multiple leaders

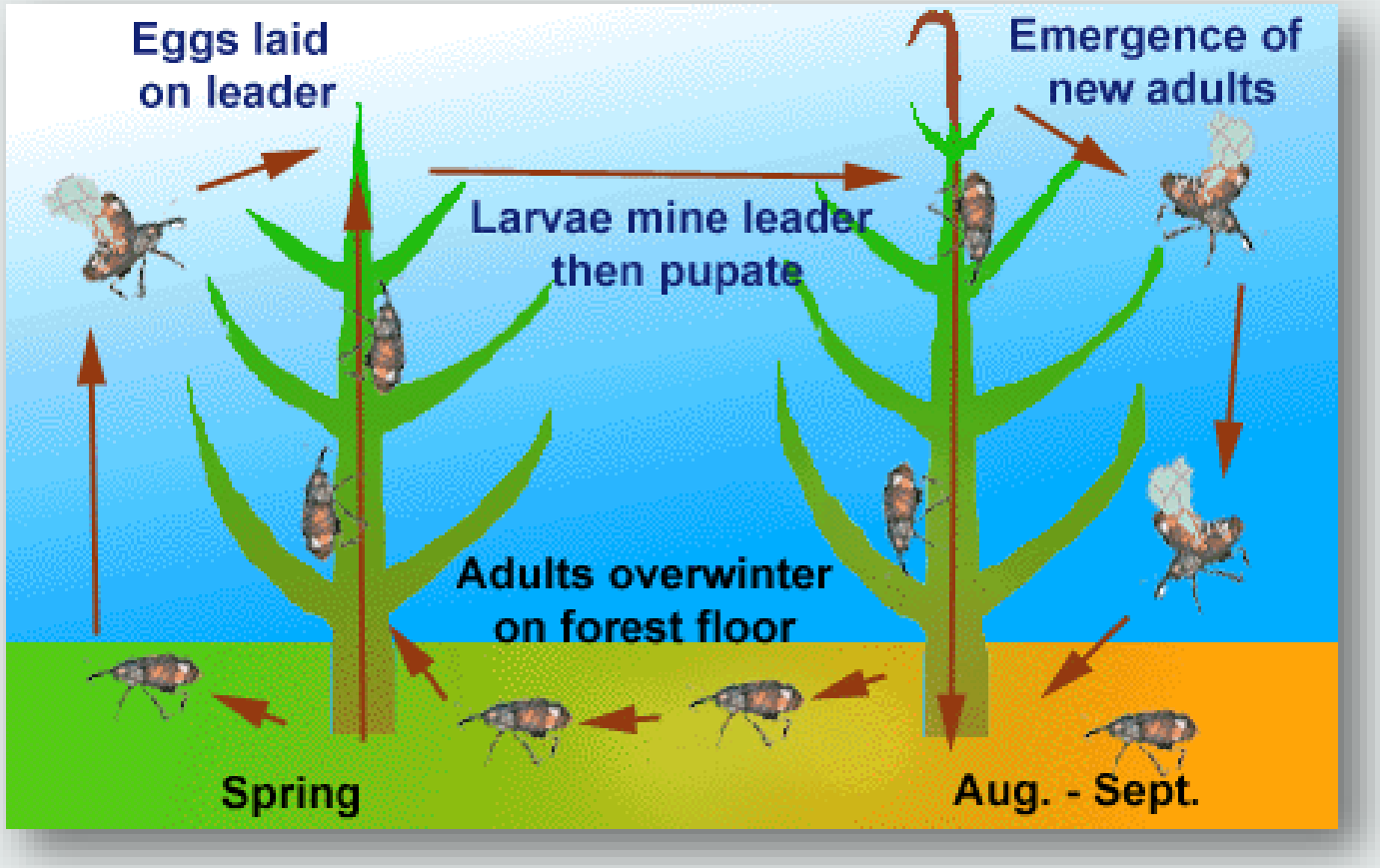
Adult weevils spend the winter in leaf litter under trees

Adults become active at full bloom of forsythia in the spring

Adults feed just below terminal bud, Lay eggs (up to 100 per female)

Grub-like larvae bore into terminal

White Pine Weevil



Management

Sanitation:
Clean up duff under trees in late fall to reduce populations for the following spring

Insecticides:
Apply preventive sprays to spruce terminal branches beginning at forsythia bloom and keep protected for two weeks
Pyrethroids: bifenthrin, cyfluthrin
Systemics: imidacloprid?

Summer pruning:
Prune out terminal shoots with shepherd's crook & destroy before larvae pupate

Locust Borer

Striking black and yellow longhorned beetle (~1 inch long)

Hosts: Black locust ('Purple Robe'); Honeylocust is not attacked

Adults become active about the first week of August along Wasatch Front; early bloom of goldenrod (nectar feeders)

Female lays up to 200 eggs in bark crevices near wounds on trunk & larger branches

Larvae bore into cambium, remain for the winter

In spring, larvae bore into sapwood & heartwood (large tunnels)

Locust Borer

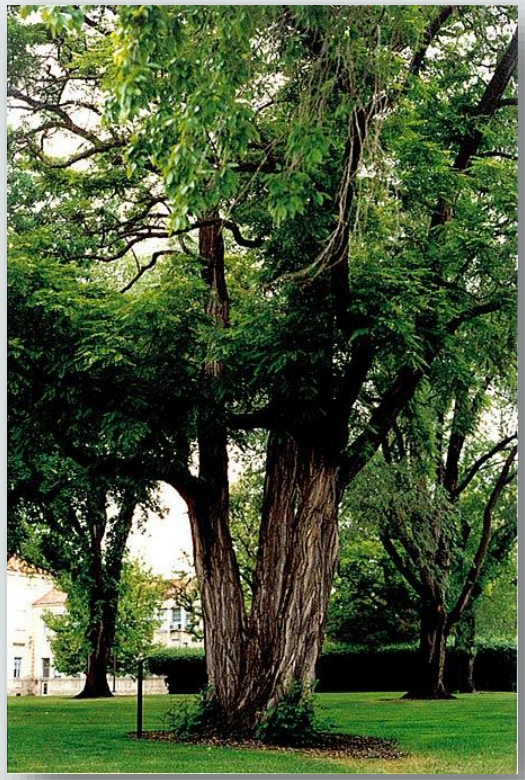
Management

Avoid planting black locust

Maintain healthy trees with optimal watering and fertilization

Prune to remove damaged limbs (hazards in wind storms)

Preventive insecticide trunk sprays
Beginning mid-August, repeat once or twice through early October
carbaryl, pyrethroids



Invasive Nuisance Insect Pests

Elm Seed Bug

First confirmed detection in Utah: July, 2014
(Salt Lake and Cache Counties)

Native to Europe
Idaho in 2012
Oregon in 2013

Seed bug family: Lygaeidae
Feeds primarily on elm seeds, also other trees

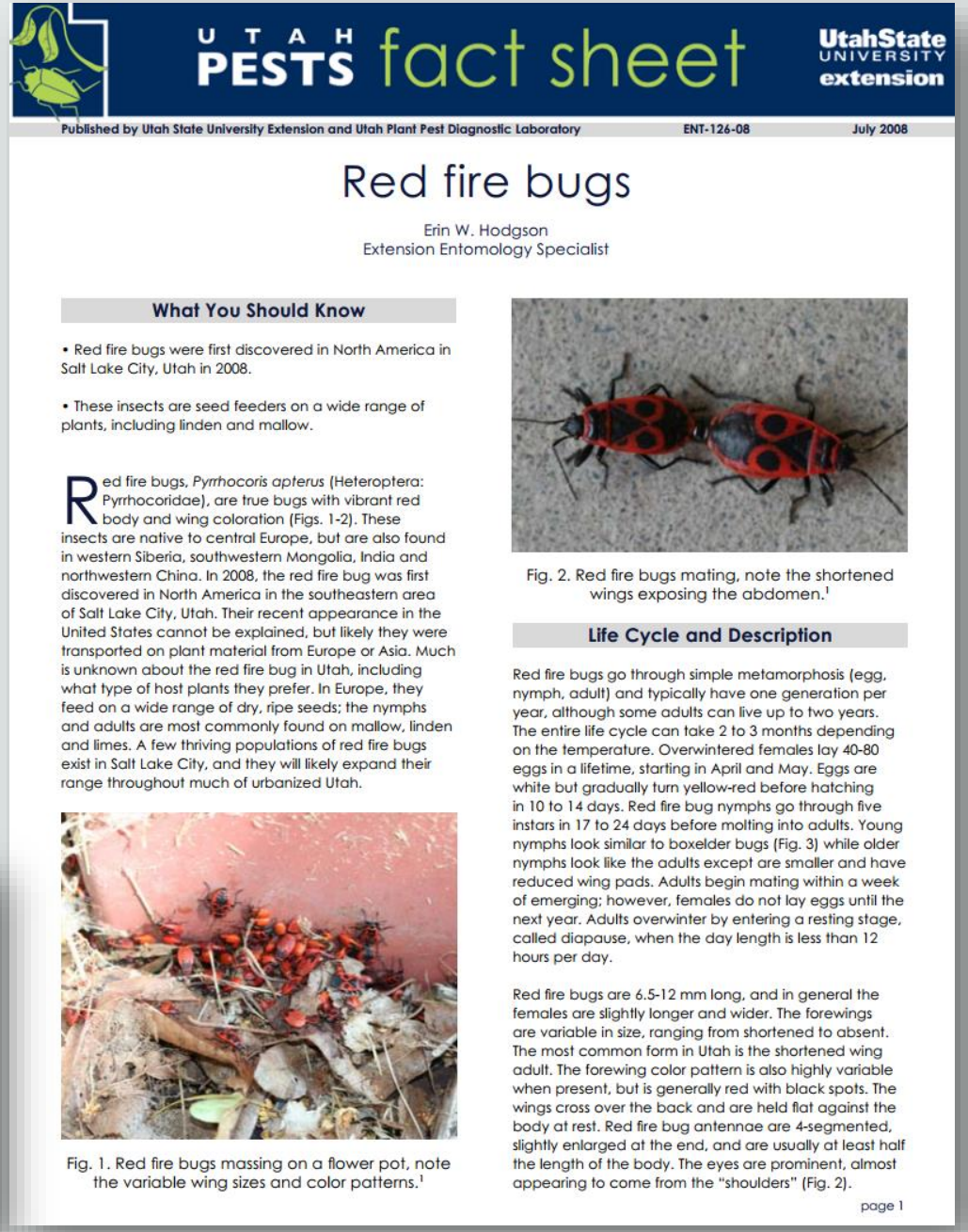
Major nuisance pest
Enters buildings (like boxelder bug)
Emits a pungent odor from scent glands
(bitter almonds)

In Italy, apply insecticides to host trees when immature stage (nymph) is present (spring and early summer; May-June)

Use building exclusion techniques like for boxelder bug; vacuum congregations – warm soapy water

Red Fire Bug

- First North America detection in Salt Lake City in 2008
  - Detected in Kaysville (Davis Co.) in 2014
- Native to Europe and Asia
- Seed feeders (Pyrrhocoridae): linden, mallow, and limes (dry, ripe seeds)
- Seek shade on hot days
- Congregate on structures, plants and under leaf litter
- Manage like boxelder bug



UTAH PESTS fact sheet

UtahState UNIVERSITY extension

Published by Utah State University Extension and Utah Plant Pest Diagnostic Laboratory ENT-126-08 July 2008

Red fire bugs

Erin W. Hodgson
Extension Entomology Specialist

What You Should Know

- Red fire bugs were first discovered in North America in Salt Lake City, Utah in 2008.
- These insects are seed feeders on a wide range of plants, including linden and mallow.

Red fire bugs, *Pyrrhocoris apterus* (Heteroptera: Pyrrhocoridae), are true bugs with vibrant red body and wing coloration (Figs. 1-2). These insects are native to central Europe, but are also found in western Siberia, southwestern Mongolia, India and northwestern China. In 2008, the red fire bug was first discovered in North America in the southeastern area of Salt Lake City, Utah. Their recent appearance in the United States cannot be explained, but likely they were transported on plant material from Europe or Asia. Much is unknown about the red fire bug in Utah, including what type of host plants they prefer. In Europe, they feed on a wide range of dry, ripe seeds; the nymphs and adults are most commonly found on mallow, linden and limes. A few thriving populations of red fire bugs exist in Salt Lake City, and they will likely expand their range throughout much of urbanized Utah.

Fig. 1. Red fire bugs massing on a flower pot, note the variable wing sizes and color patterns.[1]

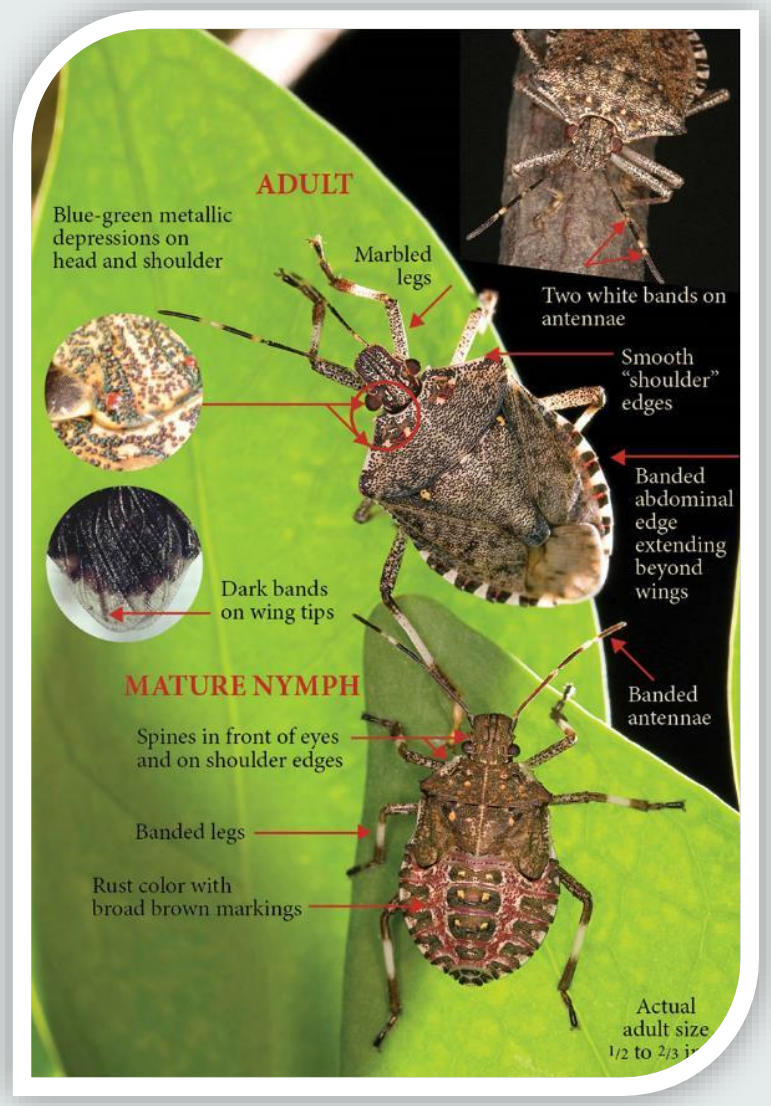
Fig. 2. Red fire bugs mating, note the shortened wings exposing the abdomen.[1]

Life Cycle and Description

Red fire bugs go through simple metamorphosis (egg, nymph, adult) and typically have one generation per year, although some adults can live up to two years. The entire life cycle can take 2 to 3 months depending on the temperature. Overwintered females lay 40-80 eggs in a lifetime, starting in April and May. Eggs are white but gradually turn yellow-red before hatching in 10 to 14 days. Red fire bug nymphs go through five instars in 17 to 24 days before molting into adults. Young nymphs look similar to boxelder bugs (Fig. 3) while older nymphs look like the adults except are smaller and have reduced wing pads. Adults begin mating within a week of emerging; however, females do not lay eggs until the next year. Adults overwinter by entering a resting stage, called diapause, when the day length is less than 12 hours per day.

Red fire bugs are 6.5-12 mm long, and in general the females are slightly longer and wider. The forewings are variable in size, ranging from shortened to absent. The most common form in Utah is the shortened wing adult. The forewing color pattern is also highly variable when present, but is generally red with black spots. The wings cross over the back and are held flat against the body at rest. Red fire bug antennae are 4-segmented, slightly enlarged at the end, and are usually at least half the length of the body. The eyes are prominent, almost appearing to come from the "shoulders" (Fig. 2).

Brown Marmorated Stink Bug



Invades homes/buildings in the fall/winter – major nuisance pest

Extremely broad host range: field crops, fruits, vegetables, fruiting ornamentals

Can cause substantial economic crop loss

Difficult to control with insecticides

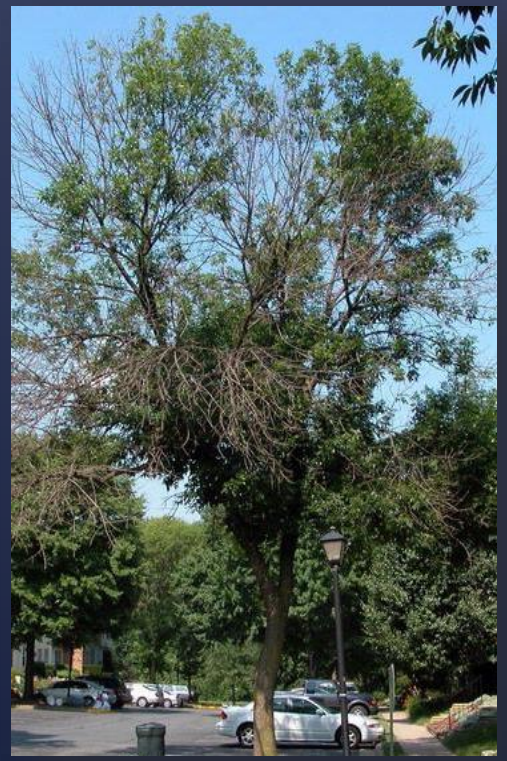
Trapped in Salt Lake and Utah Cos. 2012-2014
Avenues, University of Utah, Eastern Bench

Look alike:
Rough stink bug
(native to Utah)

Brown Marmorated Stink Bug

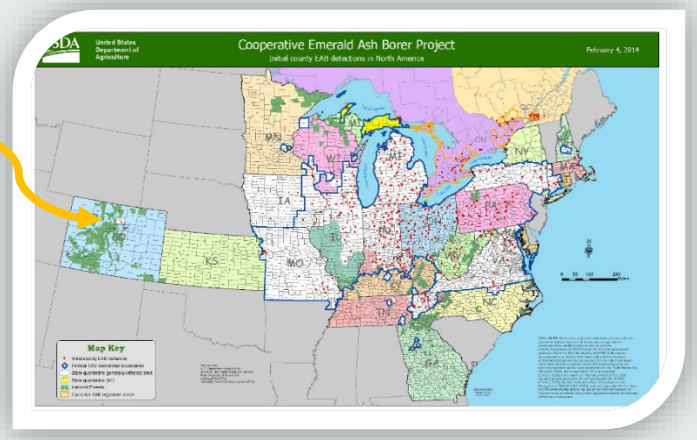
- Native to eastern Asia
- First detected in the U.S. in Pennsylvania in late 1990s
- Feeds on a broad range of plants
  - crops, ornamentals
- Can be a major nuisance pest

High Alert Potential Invasive: Emerald Ash Borer



Emerald Ash Borer: Invasive – not in Utah, yet…

Boulder, CO



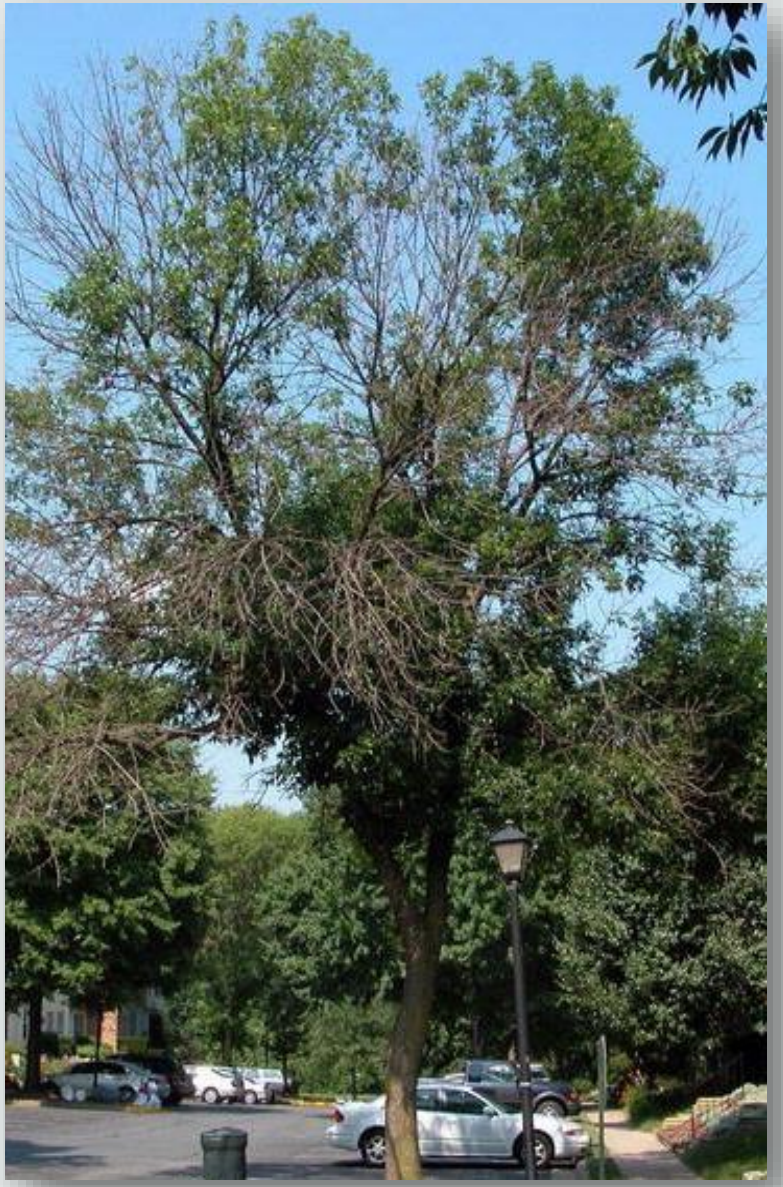
Emerald Ash Borer is on our doorstep

- Native to Asia
- Flatheaded beetle (Buprestidae) (~1/2 inch)
- Larvae feed on inner bark disrupting water & nutrient transport
- First found in the U.S. in MI in 2002
- Killed nearly 60 million ash trees (~50 mill in southern Michigan)
- Attacks mature trees (olive family, Oleaceae)
  - Ash: all species of North American ash
  - White fringetree (*Chioanthus virginicus* L.)

Larva

Larval Tunnels - Injury

Monitoring



Monitoring

Monitoring

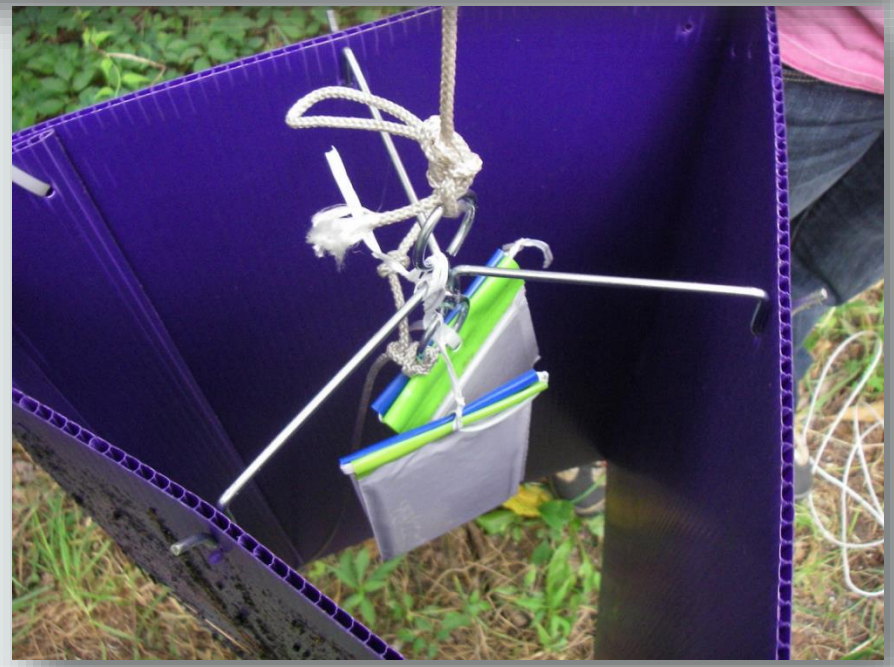
D-shaped exit hole

Monitoring

Monitoring – Degree days/plant indicator

Pest Life Stage	Degree Days	Plant Indicator
start of adult emergence	450 - 500	black locust bloom May to early June
peak of adult emergence	900 - 1100	catalpa bloom June

Monitoring



Monitoring and Management Practices

Knowing When or Whether to Treat

- No threshold has been set
- When present, trees should be protected
  - within two miles of attacked tree
- Protective trunk sprays
  - pyrethroids
- Inject systemic
  - Safari (dinotefuran)

Management Practices


Promise to Protect
Our Sluggers.
Ash wood is used for all sorts of important things, including hand tools, furniture, guitars, hockey sticks — and baseball bats! Protect our national pastime!
Don't move firewood!


PROMISE
AMERICA
you won't move firewood.
Moving firewood kills trees.

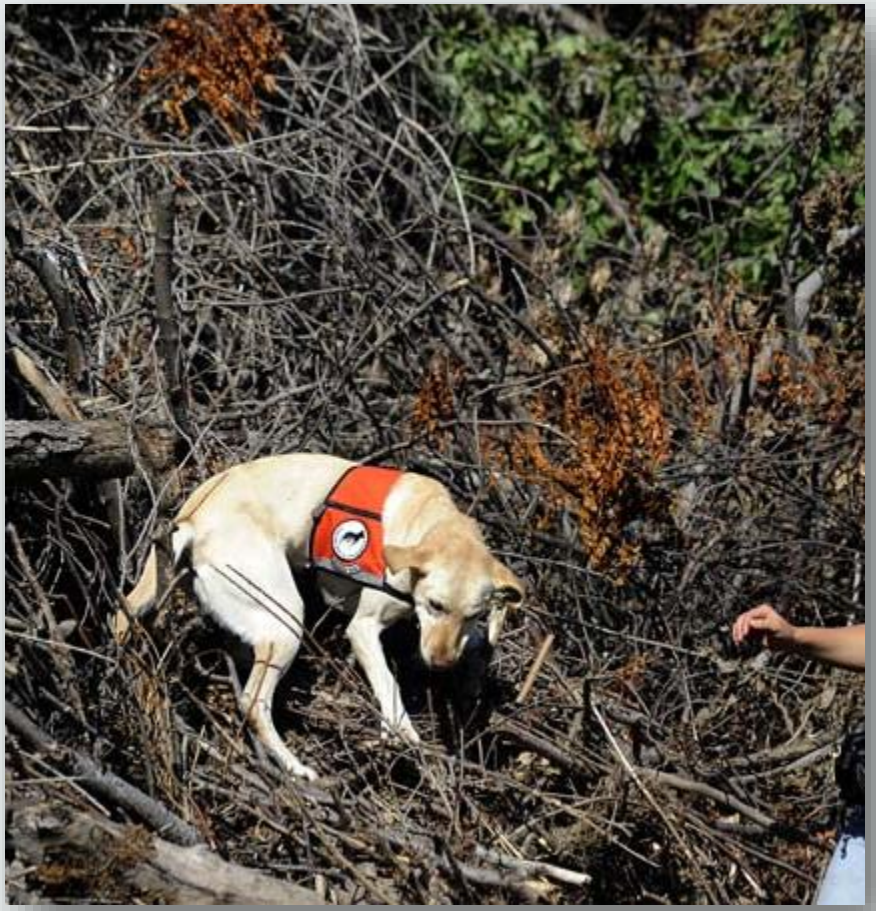

DON'T MOVE FIREWOOD
How you can help:
HELP STOP INVASIVE PESTS
For more information, visit the following Web sites:
www.massnrc.org/pests
www.na.fs.fs.fed.us/fhp
www.aphis.usda.gov/ppq/ep
www.emeraldashborer.info
USDA Forest Service
Northeastern Area
State and Private Forestry
NA-PR-02-06
April 2006
www.na.fs.fed.us
The USDA is an equal opportunity provider and employer.


BURN IT
WHERE YOU
BUY IT
Stop the Emerald Ash Borer
Don't Move Firewood › StopTheBeetle.info


Firewood
ALERT
Help stop the
spread of exotic pests
BRING FIREWOOD INTO NORTH DAKOTA!


DON'T MOVE
FIREWOOD

Management Practices

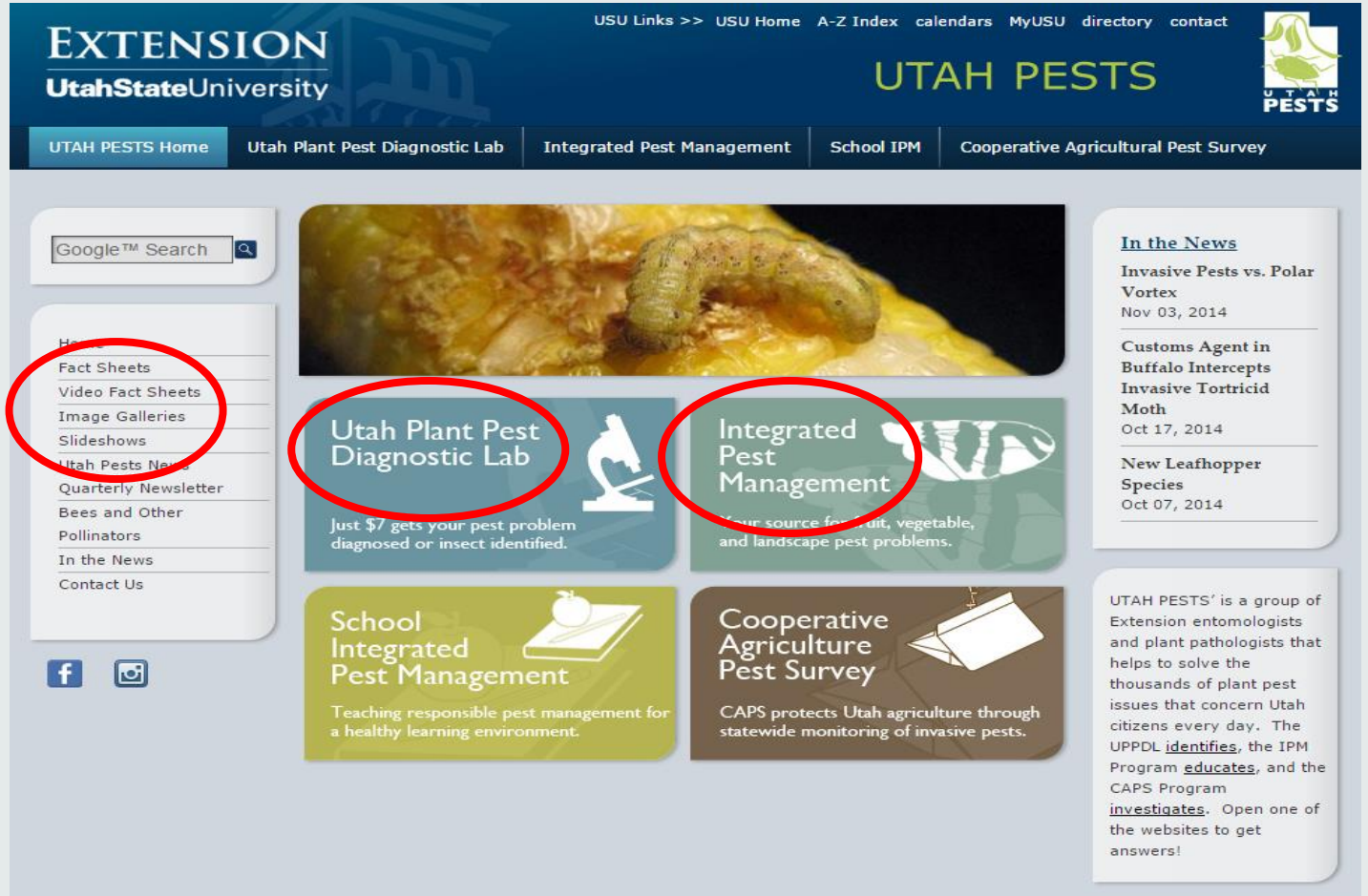


Management Practices

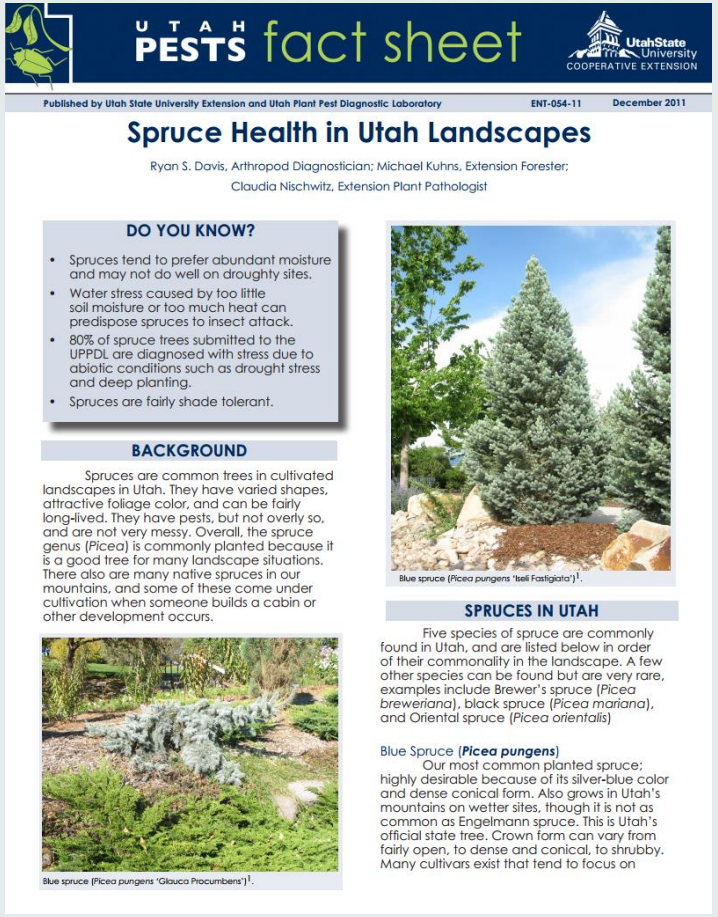
Management Practices

Utah Pests Online Resources

www.utahpests.usu.edu



Fact Sheets: over 200 fact sheets on pests of ornamentals, turf, fruits, vegetables, field crops, health-related, nuisance, stored products, structural, etc.



UTAH PESTS fact sheet

UtahState University COOPERATIVE EXTENSION

Published by Utah State University Extension and Utah Plant Pest Diagnostic Laboratory ENT-054-11 December 2011

Spruce Health in Utah Landscapes

Ryan S. Davis, Arthropod Diagnostician; Michael Kuhns, Extension Forester; Claudia Nischwitz, Extension Plant Pathologist

DO YOU KNOW?

- Spruces tend to prefer abundant moisture and may not do well on droughty sites.
- Water stress caused by too little soil moisture or too much heat can predispose spruces to insect attack.
- 80% of spruce trees submitted to the UPPDL are diagnosed with stress due to abiotic conditions such as drought stress and deep planting.
- Spruces are fairly shade tolerant.

BACKGROUND

Spruces are common trees in cultivated landscapes in Utah. They have varied shapes, attractive foliage color, and can be fairly long-lived. They have pests, but not overly so, and are not very messy. Overall, the spruce genus (*Picea*) is commonly planted because it is a good tree for many landscape situations. There also are many native spruces in our mountains, and some of these come under cultivation when someone builds a cabin or other development occurs.

Blue spruce (*Picea pungens* 'Glauca Procumbens')[1].

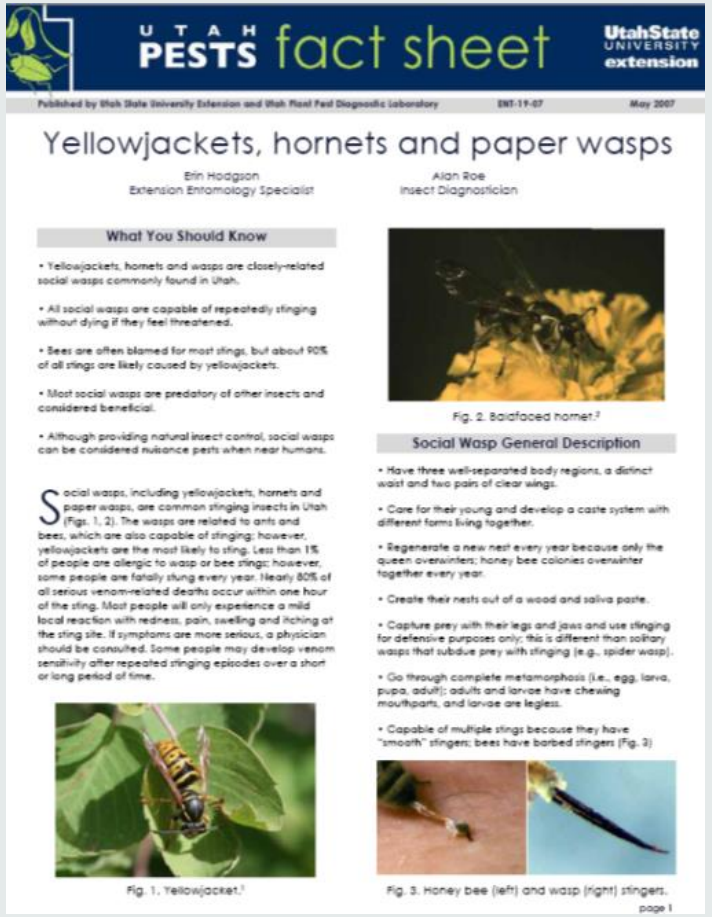
Blue spruce (*Picea pungens* 'Iseli Fastigiata')[1].

SPRUCES IN UTAH

Five species of spruce are commonly found in Utah, and are listed below in order of their commonality in the landscape. A few other species can be found but are very rare, examples include Brewer's spruce (*Picea breweriana*), black spruce (*Picea mariana*), and Oriental spruce (*Picea orientalis*)

Blue Spruce (***Picea pungens***)

Our most common planted spruce; highly desirable because of its silver-blue color and dense conical form. Also grows in Utah's mountains on wetter sites, though it is not as common as Engelmann spruce. This is Utah's official state tree. Crown form can vary from fairly open, to dense and conical, to shrubby. Many cultivars exist that tend to focus on



UTAH PESTS fact sheet

UtahState University extension

Published by Utah State University Extension and Utah Plant Pest Diagnostic Laboratory ENT-19-07 May 2007

Yellowjackets, hornets and paper wasps

Erin Hodgson, Extension Entomology Specialist — Alan Roe, Insect Diagnostician

What You Should Know

- Yellowjackets, hornets and wasps are closely-related social wasps commonly found in Utah.
- All social wasps are capable of repeatedly stinging without dying if they feel threatened.
- Bees are often blamed for most stings, but about 90% of all stings are likely caused by yellowjackets.
- Most social wasps are predatory of other insects and considered beneficial.
- Although providing natural insect control, social wasps can be considered nuisance pests when near humans.

Social wasps, including yellowjackets, hornets and paper wasps, are common stinging insects in Utah (Figs. 1, 2). The wasps are related to ants and bees, which are also capable of stinging; however, yellowjackets are the most likely to sting. Less than 1% of people are allergic to wasp or bee stings; however, some people are fatally stung every year. Nearly 80% of all serious venom-related deaths occur within one hour of the sting. Most people will only experience a mild local reaction with redness, pain, swelling and itching at the sting site. If symptoms are more serious, a physician should be consulted. Some people may develop venom sensitivity after repeated stinging episodes over a short or long period of time.

Fig. 1. Yellowjacket.[1]

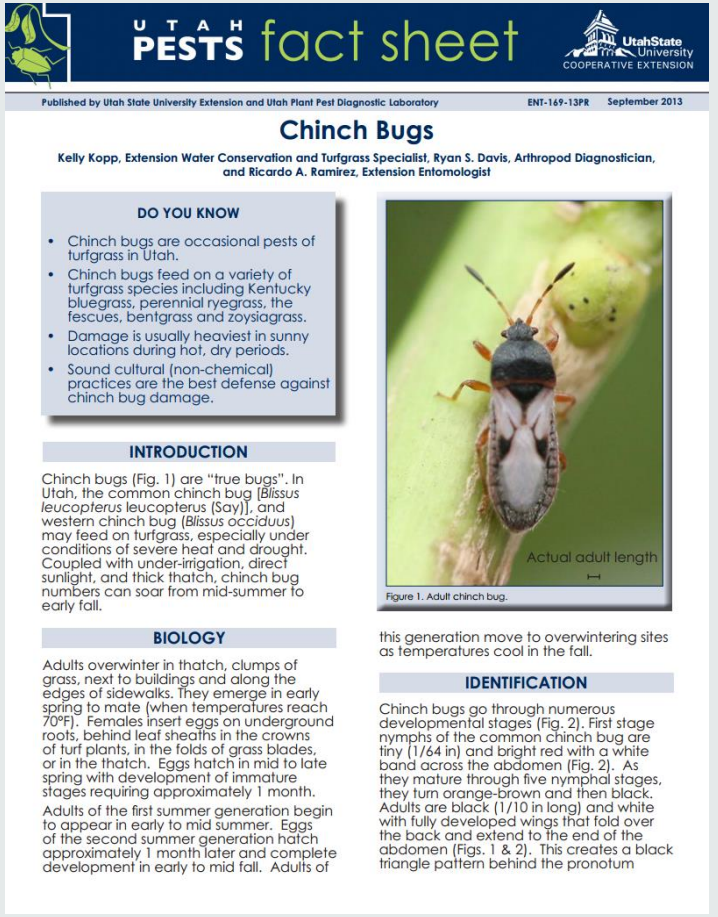
Fig. 2. Baldfaced hornet.[2]

Social Wasp General Description

- Have three well-separated body regions, a distinct waist and two pairs of clear wings.
- Care for their young and develop a caste system with different forms living together.
- Regenerate a new nest every year because only the queen overwinters; honey bee colonies overwinter together every year.
- Create their nests out of a wood and saliva paste.
- Capture prey with their legs and jaws and use stinging for defensive purposes only; this is different than solitary wasps that subdue prey with stinging (e.g., spider wasp).
- Go through complete metamorphosis (i.e., egg, larva, pupa, adult); adults and larvae have chewing mouthparts, and larvae are legless.
- Capable of multiple stings because they have "smooth" stingers; bees have barbed stingers (Fig. 3)

Fig. 3. Honey bee (left) and wasp (right) stingers.

page 1



UTAH PESTS fact sheet

UtahState University COOPERATIVE EXTENSION

Published by Utah State University Extension and Utah Plant Pest Diagnostic Laboratory ENT-169-13PR September 2013

Chinch Bugs

Kelly Kopp, Extension Water Conservation and Turfgrass Specialist, Ryan S. Davis, Arthropod Diagnostician, and Ricardo A. Ramirez, Extension Entomologist

DO YOU KNOW

- Chinch bugs are occasional pests of turfgrass in Utah.
- Chinch bugs feed on a variety of turfgrass species including Kentucky bluegrass, perennial ryegrass, the fescues, bentgrass and zoysiagrass.
- Damage is usually heaviest in sunny locations during hot, dry periods.
- Sound cultural (non-chemical) practices are the best defense against chinch bug damage.

INTRODUCTION

Chinch bugs (Fig. 1) are "true bugs". In Utah, the common chinch bug (*Blissus leucopterus* leucopterus (Say)), and western chinch bug (*Blissus occiduus*) may feed on turfgrass, especially under conditions of severe heat and drought. Coupled with under-irrigation, direct sunlight, and thick thatch, chinch bug numbers can soar from mid-summer to early fall.

BIOLOGY

Adults overwinter in thatch, clumps of grass, next to buildings and along the edges of sidewalks. They emerge in early spring to mate (when temperatures reach 70°F). Females insert eggs on underground roots, behind leaf sheaths in the crowns of turf plants, in the folds of grass blades, or in the thatch. Eggs hatch in mid to late spring with development of immature stages requiring approximately 1 month.

Adults of the first summer generation begin to appear in early to mid summer. Eggs of the second summer generation hatch approximately 1 month later and complete development in early to mid fall. Adults of this generation move to overwintering sites as temperatures cool in the fall.

Actual adult length

Figure 1. Adult chinch bug.

IDENTIFICATION

Chinch bugs go through numerous developmental stages (Fig. 2). First stage nymphs of the common chinch bug are tiny (1/64 in) and bright red with a white band across the abdomen (Fig. 2). As they mature through five nymphal stages, they turn orange-brown and then black. Adults are black (1/10 in long) and white with fully developed wings that fold over the back and extend to the end of the abdomen (Figs. 1 & 2). This creates a black triangle pattern behind the pronotum

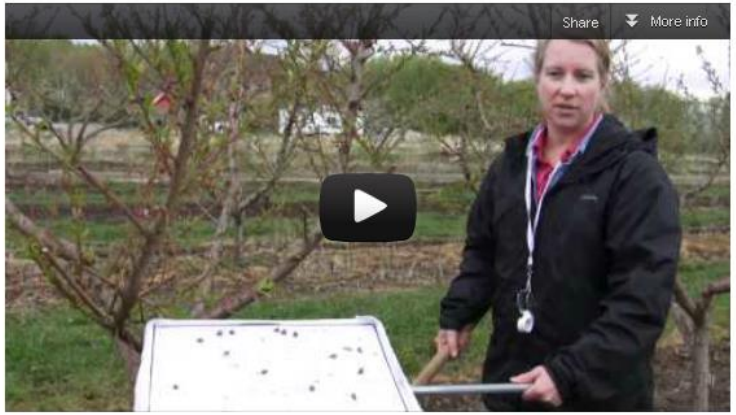
Video Fact Sheets

Paper Wasp Traps

Entomologist Diane Alston discusses the difference between native paper wasps and European paper wasps, and how to make your own traps to combat them.

Using a Beating Tray

A beating tray is a large cloth frame that is used to catch insects that fall from a shaken branch. It is helpful for monitoring a large area, such as an orchard, quickly.



Billbug Identification and Detection in Turf

Entomologist Ricardo Ramirez discusses the identifying characteristics of billbugs in turf, and demonstrates how to detect the damaging larval stage.

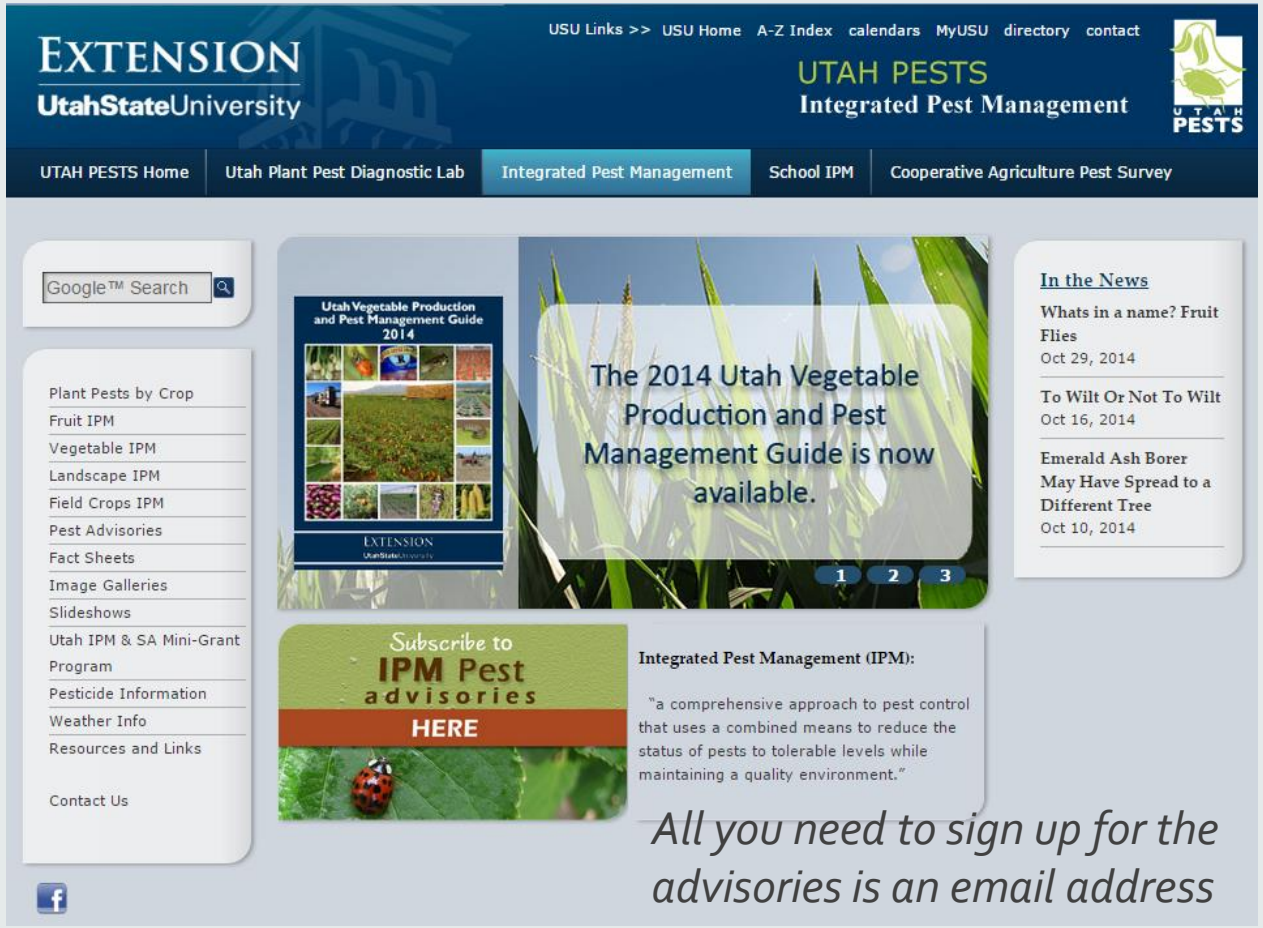
Tips for avoiding bed bugs while traveling.

Entomologist Ryan Davis discusses safe travel techniques to avoid falling prey to bed bugs, and how to minimize the chances of bringing bed bugs back to the home.

IPM Advisories:

ornamentals, turf, fruits, vegetables

www.utahpests.usu.edu/ipm



All you need to sign up for the advisories is an email address

Free subscription

Timely info on pest activity

- -insects
- -mites
- -diseases
- -nutrient deficiencies
- -environmental stress

Lots of images!

IPM recommendations

Effective pesticides

IPM Advisories (2014 Examples)

EXTENSION UtahStateUniversity

Landscape IPM Advisory

UTAH PESTS

Pest Update for Woody Ornamentals, Utah State University Extension, **July 22, 2014**

What's In Bloom

(Salt Lake City area)

Butterfly bush: bloom
Goldenrain tree: bloom
Mimosa: end bloom
Rose-of-Sharon: begin bloom
Shrub roses: end bloom
Smokebush: end bloom
Smooth hydrangea: bloom
Sourwood: bloom
Sumac: end bloom
Sweet Autumn clematis: begin bloom
Trumpet vine: end bloom
Vitex: full bloom

Insect/Disease Information

DECIDUOUS TREES

Honeylocust Spider Mite

Hosts: Honeylocust

Honeylocust spider mites can sometimes be a problem, especially on drought-stressed trees. They feed on the undersides of leaves and cause them to turn yellow-bronze in color and eventually drop. Their populations build rapidly in hot weather, and they are starting to be noticeable now. This pest will not kill trees, but repeated infestations can cause growth to slow.

This spider mite overwinters as orange-colored adult females in cracks and crevices on the bark of the tree. They become active in spring and lay eggs in June. When the weather heats up in July, the time between generations (eggs to adult) changes from 11 days to just 4!

Check for mites at the base of honeylocust leaflets with a hand lens, or shake leaves over a cloth tray. The mites will appear as tiny, slow-moving specks.

Treatment:
Drought-stressed trees are more susceptible, so water trees deeply during dry spells. Mites are easily controlled with miticide sprays for commercial use, or horticultural oil or soap for residential use. Dormant oil is an excellent choice to kill the overwintering adults.

Locust Borer

Hosts: Black Locust

The locust borer is a beetle that attacks black locust (*Robinia pseudoacacia*) and its cultivars. 'Purple Robe' locust is the most common black locust planted in Utah. Honeylocust (*Gleditsia triacanthos*) is not attacked.

Adults of the locust borer will be active in the first week of August in the Salt Lake City area, around the time that goldenrods start blooming. The adults feed on nectar while the larvae cause the damage in the tree.

Locust Borer is continued on next page

UtahState UNIVERSITY extension

Turfgrass IPM Advisory

UTAH PESTS

Seasonal Turfgrass Pest Update, Utah State University Extension, Fall 2014

Turfgrass Integrated Pest Management

An integrative approach to the management of turfgrass insect pests, diseases and weeds is most effective. Often, prevention is the best strategy and management practices can help grasses to resist and recover from pest damage.

News/What to Watch For

New information is available regarding billbug activity and management in the state, including a new insecticide option. We also have a new insect pest to contend with in Utah. Crane fly has been found in the state for the first time this year. Of course, routine fall management practices are also a priority now.

Billbug: Activity in Turf and a New Insecticide Option

Billbugs (*Sphenophorus* spp.) are a primary pest of turfgrass in the Intermountain West. Adult weevils deposit eggs in turf stems. Larvae then emerge from the eggs and feed within the stems. Mature larvae feed on roots below ground, and eventually pupate with adults emerging from the soil.

Although the adults do feed on turf aboveground, the majority of turf damage results from larval feeding and is seen as severe discoloration resembling drought stressed turf, and in severe cases plant death.

Most of what we know about billbugs comes from research conducted in the eastern U.S., yet we find many differences in Utah and the Intermountain West. In the Intermountain West, there is a complex of three billbug species that occurs simultaneously including the bluegrass, hunting, and Rocky Mountain billbugs. In some isolated spots, the Phoenix billbug also occurs. In other regions of the U.S., only one and sometimes two of these species will be present as major pests.

Current predictive models for billbug activity do not appear to be a good fit for predicting billbug populations in the Intermountain West. For example, first occurrence of billbugs in Logan, UT in 2014 was more than one month earlier (60 degree $days_{50}$; April 12) than what would be predicted by the current Base 50 degree day (DD) model* used in the east (280-352DD; May25-31). Recognizing these differences is key to improving the timing and resulting efficacy of management strategies that are available.

EXTENSION UtahStateUniversity

Vegetable IPM Advisory

UTAH PESTS

Pest and Production Update, Utah State University Extension, **October 14, 2014**

Fruit Rots of Cucurbits

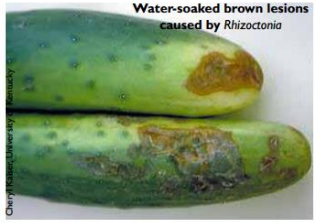
(Preharvest and Postharvest)

Belly Rot:

Belly rot begins on the underside of the fruit and is caused by *Rhizoctonia solani*, which is a common soil inhabitant worldwide. Rhizoctonia affects many plant species and can attack most plant parts. Although all of the cucurbits may be infected, cucumber is the most susceptible.

Symptoms:

Water-soaked, tan to brown lesions, which become sunken, cratered, irregular, and dried as they enlarge appear on the undersides and blossom ends of cucumber fruit. The cratered area has a crusty appearance that may be confused with symptoms of scab. Infection of cucurbit fruit usually does not lead to soft rot of tissue.



Disease Cycle:

The pathogen survives in the soil on plant tissue. Rhizoctonia invades cucurbit fruit in contact with the soil. Temperature is considered more important than moisture for disease development, although high relative humidity near the soil surface under dense foliage promotes infection. Infection can occur between 46° and 95°F. High proportions of fruit may be invaded at the optimal temperature of 80.6°F.

Control:

Fumigate and deep plow (7.9 to 9.8 inches) your field/garden before planting next spring. Use barriers such as plastic mulch, wire, asphalt shingles, or wood between the soil and produce to prevent fruits from coming in contact with the pathogen. Soil-applied fungicides may be used but generally do not control belly rot consistently.

For this information on belly rot plus more see University of Kentucky's plant pathology fact sheet http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-VG-7.pdf

Fusarium Rot:

Fusarium rot is one of the more common preharvest and postharvest diseases of cucurbit fruits.

Symptoms:

Symptoms of Fusarium fruit rot symptoms can vary depending on the Fusarium species, the host plant, and the stage of lesion development. However, there are striking similarities in symptomatology among some Fusarium rots.

One group of Fusarium species produces brown internal lesions; a cross section of a mature lesion reveals a dry, brown, spongy rot with a white halo. In melon, lesions, which can be detected preharvest, generally remain green around the margin while the rest of the fruit begins to turn yellow at maturity. The disease is characterized by large cracks in skin. The net on the surface of the fruit is typically enlarged or thickened and is a dark tan. Diseased tissue can be easily removed since there is usually a distinct line between diseased and healthy tissue.

Another group of Fusarium species produces a distinct reddish or purplish pigmentation in the diseased area.

continued on next page

Pest Diagnostics

Utah Plant Pest Diagnostic Lab

www.utahpests.usu.edu/uppdl

Sample Submission

Invasive Insect Field Guide for Utah
www.utahpests.usu.edu: Cooperative Agricultural Pest Survey

Most Unwanted Invaders (in left navigation bar)

Invasive Insect Field Guide for Utah (link)

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Find this slideshow and others at www.utahpests.usu.edu

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