



Unusual Spring Weather Presents Unusual Utah Pest: Winter Grain Mite

What's Inside

Dothistroma Needle Blight on Pines

Coryneum Blight

News from the UPPDL:
State Funding!
Real-Time PCR

Black Grass Bug

Tree Planting Tips

National News

News Highlights

**NEW UTAH PESTS
FACT SHEETS**

The following can be found on our Web site:

Cankercworms

Cucumber Beetles

Curly Top of Tomato

Necrotic Ring Spot

Onion Powdery Mildew

Onion Thrips

Subterranean Termites

Snow Mold on Grains

Using Degree Days

UTAH PESTS MEMBER ON SABBATICAL

You may have tried to contact Dr. Diane Alston only to hear, "she's in Michigan." Actually, she is continuing her cherry fruit fly research in the tart cherry capital of the U.S. with fellow MSU colleagues. We wish her the best!

www.utahpests.usu.edu

In April, a "first time" sample of winter grain mite (*Penthaleus major*) was submitted to the Utah Plant Pest Diagnostic Lab (UPPDL) by a soft white wheat grower in Box Elder County. Winter grain mite is distributed throughout North America, but requires more moisture than warm season mites and is not a frequently pest in the arid states of the West. This year's cool moist spring conditions, however, were prime for its population growth. Winter grain mite causes damage to small grains, including wheat, barley, oats, rye, ryegrass, bluegrass, bentgrass, fescue, vegetables, legumes, ornamental flowers, cotton, peanuts, and various weeds.

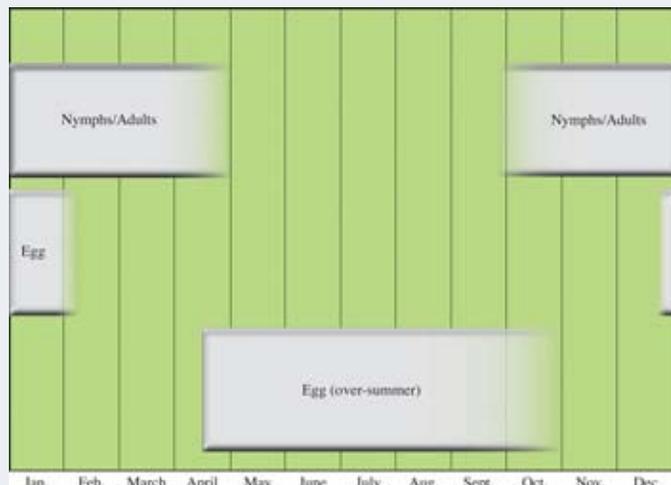
Up close, damage from this mite looks like white or gray specks on the leaves. This is caused by their piercing mouthparts, which puncture individual cells, allowing the contents to be consumed.

From afar, the small grain or grass field will have a yellow/gray/silver cast, showing up in winter or early spring. Overall damage to plants can be caused from feeding on the base of the plant by larvae and adults. Heavy pressure from these mites can cause stunting and reduced yield.

Winter grain mites are not insects, but rather small arachnids related to spiders and ticks. They have eight legs, no wings, and piercing mouthparts. Compared to other mites they are relatively big, about 3/64-inch long. These mites can easily be seen with a 10x hand lens. They are black with red legs, and a red section toward the rear of their body on the back (shown above). They are the only cool season mite that has this appearance.



University of Nebraska Dept. of Ent.



Life cycle of winter grain mite.

Winter grain mite has two generations per year. Depending on temperature and moisture, the first generation hatches from over-summer eggs in late September through early November. The mites take about 35 days to reach maturity. Winter grain mite females are asexual, and can lay around 30 eggs during her short (~35 day) adult life. The winter eggs take about 25 to 35 days to develop before they hatch (2nd generation). These mites reach maturity and lay the over-summer eggs. Winter grain mite populations (and damage) peak in December/January, and again in March/April.

Knowing the habits of winter grain mite can help you control this pest. First, the eggs are laid by the female on the soil or on the base of

UTAH PESTS Staff

Diane Alston

Entomology Specialist
diane.alston@usu.edu
435-797-2516

Ryan Davis

Insect Diagnostician
ryan.davis@biology.usu.edu
435-797-2435

Kent Evans

Plant Pathology Specialist
sickplants@gmail.com
435-797-2504

Erin Frank

Plant Disease Diagnostician
erin.frank@usu.edu
435-797-2435

Erin Hodgson

Entomology Specialist
erin@biology.usu.edu
435-797-5689

Marion Murray

IPM Project Leader
Editor, Utah Pests News
marion.murray@usu.edu
435-797-0776

Utah Plant Pest Diagnostic Lab

BNR Room 203
Utah State University
5305 Old Main Hill
Logan, UT 84322

Utah Pests News
is published quarterly by the
UTAH PESTS staff.

www.utahpests.usu.edu

UtahState
UNIVERSITY
extension

leaf sheathes. The larval stage feeds on the base of the plant. The nymphs and the adults can feed around the base of the plant, but on cool, cloudy days and at night, they will feed higher up on the plant. Generally, it is better to search for mites at night. When approached, however, they will fall from the plant to the soil where they are difficult to see. Optimum temperatures for egg hatch are between 45°F and 55°F, and between 40°F and 75°F for adult feeding. When temperatures fall below, or exceed these ranges, mites retreat to the soil. In the case of severe temperatures or moisture deficits the mites can move 4 to 5 inches into the soil. Winter grain mite populations peak in winter and spring and they spend the summer in the egg stage. In the short term these mites are capable of withstanding sub-freezing temperatures, ice, and snow. During periods of persistent snow cover, mites can feed continuously on plants under the snow.

Because of their small size and the difficulties in scouting, winter mites are easily transported from one field to another on dirty farm equipment, especially the eggs. When scouting, it is important to look at the base of the plants, the soil, and even dig up some soil where they may be hiding.

Controlling any mite species is never an easy task. Because they are so small and have such a high reproduction rate, they are able to develop pesticide resistance. Spraying chemicals for mites should always be a last resort. Because winter grain mites do not travel far and over-summer in the egg stage, cropping practices such as tilling and crop rotation can be very effective at keeping mites below economic threshold levels. Crops such as cotton, corn, clover, or sorghum are good choices for rotating. Never grow small grains for more than 2 consecutive years in the same field (if mites are a problem). To stop the spread of mites from field to field, thoroughly wash equipment to remove mites and eggs.

Winter grain mites have an interesting life cycle that consists of six parts:

1. Egg: smooth, kidney-shaped and reddish-orange, eventually wilting
2. Pre-larva: quiescent, non-feeding stage
3. Larva: 3 pair of legs, reddish-orange turning to brown after one day
4. Protonymph: 2nd stage of mite development; looks like small adult
5. Deutonymph: 3rd stage; size between adult and protonymph
6. Adult: full-grown, reproductive female mite

Use caution when treating with pesticides. Most materials registered for winter grain mite are broad-spectrum, which will provide initial control, but at the same time, kills beneficial predatory mites such as *Balaustium* spp. and other bio-control arthropods. As a result, using these types of sprays can result in a subsequent flare-up of mite populations. If a pesticide is necessary, it is best to spray when the mites are on the tops of the plants on cool, cloudy days. Spraying on days that are too hot or cold will yield poor control because the mites are safe below the soil surface. Some pesticides registered for use on winter grain mites include dimethoate, methyl parathion, chlorpyrifos (Dursban, Lorsban), and malathion. Using pesticides in combination with rotation could greatly reduce mite populations over time, making only rotation necessary in the long term.

-Ryan Davis, Arthropod Diagnostician

Dothistroma Needle Blight on Pines

The UPPDL received several samples of dothistroma needle blight on various pines this spring. This disease, caused by the fungus *Mycosphaerella pini*, affects the foliage of a range of pine species, particularly Austrian and ponderosa pines.

Lesions begin as water-soaked spots or bands, which turn tan, brown, or reddish-brown with an abrupt transition from green tissue to discolored tissue (shown at right). The red color in the needles is a result of the accumulation of dothistromin, a toxin produced by the fungus. The tips of the needles will become necrotic and die back to the lesion, while the needle bases usually stay green. One proposed resistance mechanism in pines involves the inhibition of fungal growth with sap. As such, some infected needles may produce oozing sap at the site of infection.

Once the fungus has penetrated the needle, hyphae grow into the plant cells allowing the fungus to spread. Dothistromin is dispersed into the tissue ahead of the hyphae, killing the plant cells, resulting in their collapse and the production of typical symptoms. Strong light can enhance symptoms caused by the toxin while shade can suppress them.

Within a few weeks after the lesions have formed, small black stromata will emerge from the infected needles (shown at right). These stromata contain the spores that will cause new infections, mainly by splashing rain or wind-driven rain. The spores germinate under moist conditions and although epidemics of this disease will develop quickly in areas of mild, moist climates, it is only a problem in Utah in localized areas or during wet springs.



The most immediate effect on trees infected with this disease is the reduction in growth in both height and diameter, although severe defoliation can also result in death. Trees younger than 10 years old are more susceptible. Controlling dothistroma by chemical sprays has proved feasible. In Utah, one application in May and another application in June of copper fungicides can prevent infection in both first-year and second-year needles of Austrian and ponderosa pine. However, ultimate control will be achieved through the use of resistant trees. Resistance to dothistroma varies widely within and among pines. Some seed from Austrian and ponderosa pines have been found that have a useful degree of resistance and have been used for plantings in the Great Plains.

-Erin Frank, Plant Disease Diagnostician



Dothistroma needle blight is also known as red-band disease because of the red bands that are found on infected needles. This lesion has sap in the center, which may be a defense mechanism against invasion by the fungus.



Typical banding symptoms on infected pine needles.



Infected needles will break off at the site of the band and broken needles may look burnt because the tips will have a graylashy appearance.

Watch for Coryneum Blight this Summer

With the arrival of this past springs' moderate temperatures and rainfall came the onset of conditions for coryneum blight, also known as shothole blight. This fungal disease causes damage on peach, nectarine, apricot, almond (ornamental as well as nut bearing), and cherry to a lesser degree (ornamental and fruit bearing). Coryneum blight is caused by the fungus *Wilsomyces carpophilus*. Taxonomic changes explain this fungal pathogen's name as it was once known as *Stigmia carpophila* or *Coryneum beijerinckii*.

The pathogen can infect buds, twigs, branches, blossoms, leaves, and fruit. It overwinters in infected buds and in cankers on infected twigs and branches. Spores produced from these infected tissues in the early spring are dispersed during rain events to infect new buds. Later in the season, other susceptible tissues can become infected when there is suitable moisture on leaves and fruit. The spores of this fungus, called conidia, are extremely durable and can survive in dormancy for months, exposed on the surface of a bud, waiting for just the right temperature and moisture conditions to germinate and infect its host. Coryneum often surprises growers as it is active early in spring at very cold temperatures. For example, the fungus can infect a suitable host if moisture is continuous for 24 hours or longer at only 36°F. This means that infections can occur when host plants are still dormant. At higher temperatures only 6 hours of continuous moisture at 77°F is necessary for infection. Coryneum blight can develop very rapidly under warmer temperatures with suitable moisture conditions, and will sporulate from infected tissues throughout the season during wet conditions.

Infections on leaves will develop small round purple to tan lesions or spots that are seldom 1/4-inch in diameter. Infected tissues can become raised and scurfy and will often drop out as the diseased tissue cannot expand with the growing leaf. Lesions can be circular to slightly ellipsoid. These diseased leaf tissues will tear along the lesion margins and may hang on at one attached point, but eventually drop out, giving the shothole appearance. Infected buds will often develop a canker that can expand to girdle and kill the twig. Infected buds typically will show signs of gumming. They are easily recognized as they are darker than healthy, non-infected buds. Infection on fruit appears first as small purple spots that later become white to gray lesions, often accompanied with gumming, rendering fruit unmarketable.

Cultural control practices involve pruning infected twigs and branches and destroying the debris. Thorough pruning during the dormant season is very effective and recommended for the homeowner as a major component for managing this disease. During irrigation, avoid wetting of branches,

twigs, leaves, and fruit. Chemical controls applied at 50% leaf drop include copper compounds such as Bordeaux mixture, copper based products like Kocide, and fungicides such as Ziram. Chemical applications such as these in the fall will help to protect buds during the dormant season. In the spring at shuck fall, fungicides such as Abound, Pristine, Gem, Echo 720, Bravo Weather Stik, and Ziram are effective. For commercial growers, protective fungicides should also be applied during frequent wet weather. With regard to any chemicals mentioned, read the label and follow the labeled instructions for their use. Mention or exclusion of trade names does not represent or imply endorsement nor criticism of any chemical product.

-Kent Evans, Extension Plant Pathologist



The coryneum blight fungus overwinters on infected buds or cankers (top), and infects leaves in spring during moist conditions, leaving the typical "shothole" appearance (middle). Later in the season, developing fruits become infected (in Utah, infections on peach and apricot are most common), leaving sunken pits sometimes associated with gummosis (bottom).

Ongoing State Funding Keeps UPPDL Open

Phew. The UPPDL can finally breathe a sigh of relief after 5 years of seeking state funding support. On March 6, we learned that the Utah legislature awarded the lab on-going funding under the Extension umbrella. Starting July 1, the UPPDL will receive \$100,000 annually for salaries, supplies, and educational programs.

Many of you who have been involved with USU Extension over the years probably know the history of the lab. Drs. Jay Karren and Sherm Thomson, started diagnostic services in the 1970s. Dr. Diane Alston joined the group in 1990. With the changeover of five specialists and diagnosticians, we are finally back up to full steam.

Finding the funding needed to “keep the lights on” in the UPPDL has always been a challenge. We have scrambled to find unique ways to combine funding sources to support our staff. The UPPDL has tried to get stable funding from the state of Utah on several prior occasions. Compared to other service clinics in

the state, we are considered small beans because our budget is relatively small. It was very difficult to get noticed by members of the legislature and have them understand our value. We decided the UPPDL needed a face lift of sorts, and created a more unified image called UTAH PESTS.

In 2007, we promoted the lab in trade shows, media, and with marketing materials. Drs. Noelle E. Cockett, Chuck Gay, and Larry Rupp helped the UPPDL form a request proposal. They provided much-needed experience and direction for our group. We also asked for letters of support from the most influential groups in Utah – and got them! We were hoping for the best, but prepared for the worst. Personally, I was in shock for about 3 days after hearing the news. This stable funding will allow us to maintain full-time staff, expand our services, and further benefit agriculture and horticulture in Utah.

-Erin Hodgson, Extension Entomologist

Thanks for your support!

- Central Utah Water Conservancy District
- Nu Skin International
- Red Butte Gardens
- Thanksgiving Point
- Turfgrass Producers Int.
- Utah Community Forest Council
- Utah Department of Agriculture and Food
- Utah Lawn Care and Pest Control Association
- Utah Nursery and Landscape Association
- Utah Onion Association
- Utah State Horticultural Association
- USU Extension County Agent Association
- USU Extension Master Gardener Associations

Plant Disease Diagnostics get “Techie” for 2009



It may look small, but this real time PCR machine will make big differences in the UPPDL's diagnostic services for our clients in the coming years.

the traditional techniques of diagnosing disease. It will allow us to diagnose certain plant pathogens faster, diagnose the presence of a pathogen before symptoms are visible on the plant, and to quantify the amount of the pathogen that is present on

The UPPDL received grant funding to purchase a real-time PCR machine that will increase our diagnostic capabilities. PCR (polymerase chain reaction) is a molecular technique that amplifies (exponentially increases) DNA of an organism in question. Real-time PCR is a relatively new technology that allows the amplification of DNA to be seen in real time as it is occurring. It offers many advantages over

plant tissue. Although a pathogen can be detected, it may not have caused visible symptoms. Detecting the mere presence of a specific pathogen will allow us to look for quarantine pests.

Using the technology properly and interpretation of results for Utah's plant pathogens will take time. In the coming months we will set up protocols for a variety of diagnostic tests and test those protocols to make sure they work properly. We will also build a library of DNA primers (proteins necessary to initiate DNA synthesis) that will allow us to test for a wide variety of pathogens. We hope to be able to offer molecular diagnostic services for the 2009 season.

Funding for the real time PCR machine came from the Western Plant Diagnostic Network (a division of USDA within the Department of Homeland Security), the Utah Department of Agriculture and Food, and the Utah State Horticultural Association. The UPPDL expresses sincere appreciation for the funding we received in order to purchase this machine. Successful use of real time PCR will allow the lab to reach national accreditation standards that will be required in the future.

-Erin Frank, Plant Disease Diagnostician

Black Grass Bug Flares in Utah Grasses

This spring, we've had several calls about black grass bugs in rangelands. Although black grass bugs are native to North America, they only started causing significant damage to western rangeland when wheatgrass planting started in the 1930s. Insecticidal treatments are usually not warranted because damage typically occurs to field margins adjacent to pasture or rangeland. However, there have been severe populations of black grass bugs in Utah's Box Elder, Sanpete, and Beaver counties this year.

Several different species of black grass bugs occur in Utah. The most common is *Irbisia pacifica*, and the second most common is *Labops hesperius*. As with all true bugs, they have piercing-sucking mouthparts and go through simple metamorphosis with an egg, nymph, and adult stage. (In simple metamorphosis, young insects look like adults, but without wings.) Adults range in size (1/6-1/3-inch long) and have dark bodies. Black grass bugs appear to have bulging eyes on the sides of their head (but should not be confused with the beneficial insect, minute pirate bug, which also has bulging eyes). Some black grass bugs also have dark "kneecaps." The forewings are dark and relatively slender compared to other true bugs. In some cases the fully developed female has shortened or reduced wings and readily disperses to new areas.

Black grass bugs have a wide host range and will feed on a variety of range grasses (e.g., wheatgrass, brome grass, orchardgrass and bluegrass), and field crops (e.g., barley, wheat, rye, oats). In general, Great Basin wildrye and wheatgrasses are preferred, especially blue bunch wheatgrass, crested wheatgrass and intermediate wheatgrass. Nymphs and adults use a piercing stylet to feed on the mesophyll cells within leaf blades. Black grass bugs damage the chloroplasts (where photosynthesis occurs) while feeding; white spots and chlorotic blotches often appear near feeding sites. Normally, they begin feeding at the leaf tip and progress down the leaf. Heavily infested plants will be covered in black frass, or excrement, and look straw colored or frosted.

The life cycle of black grass bugs allows for several management options. All species have one generation per year and overwinter as eggs protected in grass stems. Egg hatch begins in late April, depending on the temperature and elevation. Young grass bugs (nymphs) feed for about 4-5 weeks and go through five developmental stages (instars) before becoming adults. Adults feed and mate for another 4 weeks. Identifying early infestations before extensive damage occurs is important. Treating nymphs before they become adults can provide



UC Statewide IPM Project
© 2000 Regents, University of California

Jack Kelly Clark, UC Davis IPM Project

Black grass bug feeding results in chlorotic blotches along the leaf blade.

long term control. Timely grazing and burning in the fall and spring can also greatly reduce egg hatch the following growing season.

For more information, go to the UTAH PESTS Web site and search for the black grass bugs fact sheet at www.utahpests.usu.edu/insects/htm/factsheets.

-Erin Hodgson, Extension Entomologist

Plant Trees Properly, and They Thrive

By Taun Beddes, Extension Horticulture Agent, and Elizabeth Walker, Horticulture Intern, Cache County Extension. For more information about Cache County Extension visit: extension.usu.edu/cache/.

One of the most common factors that is overlooked concerning the health of trees is how they are planted. Correct planting can maximize growth rates, make proper watering easier and significantly increase disease and pest resistance. Trees are usually purchased from garden centers and are grown in plastic pots. These are generally referred to as containerized trees. However, in late winter and early spring, bare-root trees are also available. These have been harvested from the ground the previous fall and have had most of the soil washed from the roots.

Many of the same principles apply when planting either kind of tree. For instance, planting a tree too deeply can allow too much water to enter the root-ball, which causes the roots to rot. Another common mistake is placing trees in lawn areas. Irrigation requirements are different for each and trying to maintain both in the same vicinity can be tricky. Ideally, trees should be placed in separate beds, but planting them in turf is sometimes unavoidable. As a rule, sod should never be placed back over the top of a root-ball (Fig. 1). This makes it more difficult to determine how much water a tree is receiving, makes the tree more susceptible to damage from mowers and trimmers, and puts turf and trees unnecessarily in direct competition for nutrients (Fig. 2).



Fig. 1. Notice that all turf has been removed from the perimeter of the root-ball and that no damage from mowers or trimmers is present.

To plant bare-root trees, cut off any damaged roots just beyond the point of damage with sharp pruning shears and prune damaged branches back to a major branch intersection or to the trunk. After doing this, soak the roots in a bucket of water for 3-6 hours before planting. When you are ready to plant, dig the hole just below the tree's root collar and twice as wide as the root-ball. After digging, place a cone shaped mound of soil in the middle of the hole and gently spread the roots over the mound (Fig. 3). Gently tamp the soil, being careful not to damage the roots. Remember, you want the soil to be somewhat firm but not like cement. Bare-root trees should always be staked from two or three sides for 1 year after they are planted. When attaching rope to the tree trunk, be very careful to avoid damage by first wrapping an old cotton cloth multiple times at the point where the rope is to be attached (Fig. 4). This protects the bark from rubbing action caused by the wind.



Fig. 2. The trunk injury was caused by mowers and string trimmers.

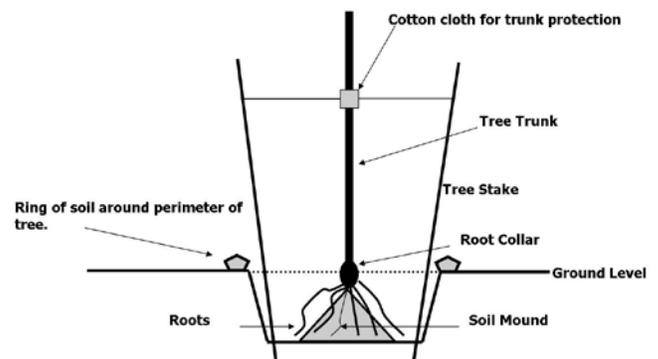


Fig. 3. A side view of how to plant a bare-root tree before all of the soil has been placed back into the hole.

When planting containerized trees, dig the hole as deep as the root-ball contained in the pot and not the pot itself. The

Continued on next page

hole should be at least 6 inches wider than the root-ball on all sides. Position the tree in the hole and place the soil back around the root-ball. When placed back into the hole, soil should be firm, but not so compacted that it inhibits water penetration. Soil should also not be placed over the top of the root-ball. Containerized trees do not always need to be staked. However, larger trees and trees planted in excessively windy areas may benefit from staking (Fig. 5). Never leave trees staked for more than 1 year and follow staking procedures mentioned previously.



Fig. 4. The twine used for staking was not removed, girdling the trunk.

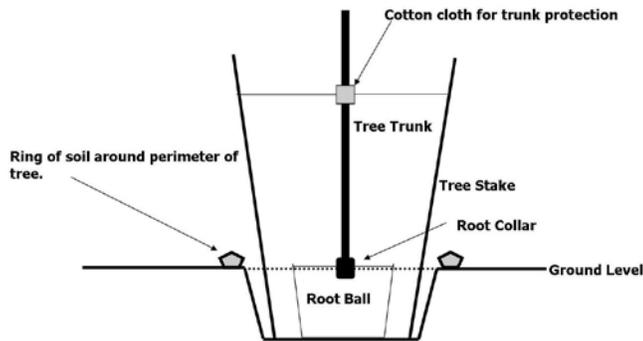


Fig. 5. A side view of how to plant a containerized tree. It is especially important to not place the top of the root-ball below ground level.

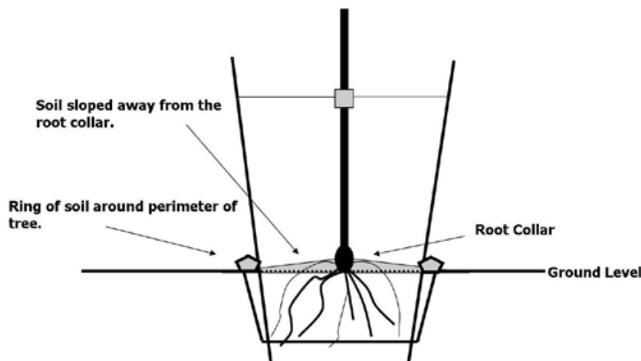


Fig. 6. A side view of how to plant a bare-root tree in soil with drainage problems. Notice the root collar has been raised above ground level.

A question often asked is whether trees should have organic matter incorporated into the soil that is placed around the roots. The answer is generally no unless the particular soil has drainage problems. If this is the case, mix three parts soil to one part coarse organic matter (not peat moss), and incorporate this mixture back around the root-ball. Plant bare-root trees so that the root collar is 1 to 2 inches above ground level and slope soil away from the root collar (Fig. 6). The same holds true for containerized trees where the actual root-ball should be raised 2 inches above ground level (Fig. 7).

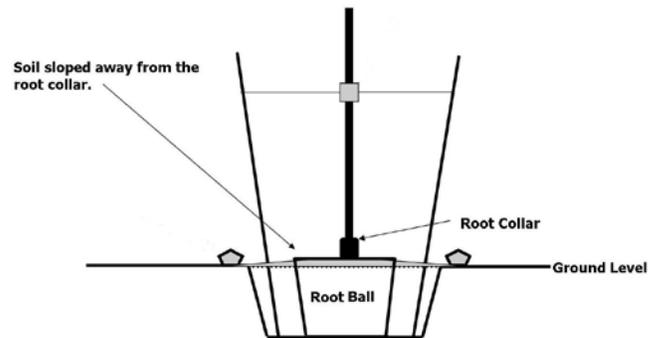


Fig. 7. A side view of how to plant a containerized tree in soil with drainage problems. Notice the top of the root-ball is above ground level and no soil has been placed over the top of the root-ball.

After planting either type of tree, it is acceptable to place a ring of soil around the root-ball to make it easier to deep water plants. This should be done so that water penetrates to the bottom of the root-ball. Check the soil periodically and when it starts to dry, deep soak the plant again. All soils are different and there is no exact science dictating how often to irrigate. Over-watering is a very common way that plants are killed. It will take one to two growing seasons to establish your plants.

In the National News

BACTERIA PROTECT WHEAT

Beneficial bacteria present on flowers could be effective in fighting infection by the fungus *Fusarium graminearum*, which causes fusarium head blight (scab) in cereal crops. The naturally occurring bacteria may compete with the fungus for nutrients secreted by the anthers on a wheat plant. The bacteria cause no harm to wheat kernels and aren't considered dangerous to consumers. In tests, spraying formulations of the bacteria on plots of two commercial wheat varieties reduced disease severity by as much as 63 percent.

FARM BILL PASSES

Congress passed the \$290 billion farm bill by over two-thirds majority, enough to keep the bill from presidential veto. Two-thirds of the money will help subsidize domestic food programs such as increasing food stamps to help offset burdens placed on needy families from the recent increase in food prices. Forty million will go toward farm subsidies, and almost \$30 billion will be allocated to farmers to take their land out of production, and other environmental programs.

NEW WHEAT VIRUS NAMED

Researchers at Kansas State University have identified a new virus affecting wheat, and named it triticum mosaic virus in 2007. It affects wheat in approximately the same manner as wheat streak mosaic virus and high plains virus. All three viruses are vectored by the wheat curl mite and the symptoms are nearly identical. Many aspects of triticum mosaic virus are unknown, including varietal resistance and yield loss potential. Because this new virus is similar to the previously existing two viruses, it is managed the same way.

NEW TOOL FOR DROUGHT

Scientists at the Agriculture Research Station in the Northern Great Plains developed a crop sequence calculator which helps farmers decide which crops to plant to maximize crop yield given available water resources. Crops include barley, buckwheat, canola, chickpea, flax grain, sorghum, lentil, proso millet, corn, crambe, dry bean, dry pea, safflower, soybean, spring wheat, and sunflower. The crop calculator CD can be ordered free online at: <http://www.ars.usda.gov/main/docs.htm?docid=13698>

TREE TANNINS AFFECT S.O.D.

More than 100 plant species are susceptible to the pathogen causing sudden oak death (SOD). Extracts from the heartwood of western red cedar, Alaskan yellow cedar, western juniper, and Port-Orford-cedar have been found to limit the growth of the pathogen that causes this disease, *Phytophthora ramorum*. They were shown to kill spores and inhibit fungal growth.

PEST ERADICATION A SUCCESS

The Asian longhorned beetle (ALB) has been officially eradicated from the city of Chicago. ALB was first discovered in Brooklyn, NY, in 1996, and in Chicago in 1998. The beetle kills a number of host trees including maple, elm, willow, birch, poplar, horse chestnut, and more. During Chicago's eradication program, more than 1,771 trees were removed to help stop this devastating pest. While there are similar looking beetles in North America, if you ever spot this beetle ([click here](#) for images and more information) please send it to the UPPDL for prompt identification—it could save a lot of trees!

Useful Publications and Web Sites

PUBLICATIONS

- Whitney Cranshaw's **Garden Insects of North America: The Ultimate Guide to Backyard Bugs**, is a 672-page book containing over 1,400 color photographs of insect garden pests and their associated damage. Around \$30 per copy online or through bookstores, every home gardener (and entomologist) should have a copy.
- For avid gardeners and weekend mowers, **Waterwise: Native Plants for Intermountain Landscapes** is a great guide to selecting

low-maintenance plants for existing landscaping or for xeriscaping projects. By Wendy Mee, Jared Barnes, Roger Kjellgren, Richard Sutton, Teresa Cerny, and Craig Johnson. The book can be purchased online or at most bookstores.

- **A Pocket Guide for IPM Scouting in Herbaceous Perennials** is a handy, color guide to common insects and diseases in your garden. It is published in Michigan, however is applicable to Utah. To order, visit: <http://www.ipm.msu.edu/PubsOrder.htm>.

WEB SITES

- www.pestinfo.org, presented by Int. Society of Pest Information, offers a 20,000-entry pest and natural enemy database.
- westernfarmpress.com is an online, free newspaper which also offers e-mail subscription service. It contains timely news on western agriculture.
- The UC Davis IPM Web site offers a wealth of information including "quick notes" at www.ipm.ucdavis.edu/QT/index.html which are abbreviated versions of full fact sheets for landscape pests.



Featured Picture of the Quarter

In last quarter's newsletter we showed a picture of herbicide injury in a greenhouse setting. Here is another case, only in a landscape setting. This pine tree was damaged by a nearby application of the broadleaf herbicide 2,4-d. It could have been caused by drift or soil uptake. Herbicide damage includes stunted growth, yellowed leaves, and cupped or distorted foliage. This pine tree will recover from the injury.

-Photo by Marion Murray

Calendar of Insect, Disease, and IPM-Related Events

June 25-27, Pacific Division APS Meeting, Jackson Hole, WY, www.apsnet.org/members/div/pacific/

July 17-18, Farm Bureau Mid-year Convention, Park City, UT, utfb.fb.org/VWebsite/CalendarofEvents.html

July 20-23, 9th International Conference on Precision Agriculture, Denver, CO, www.icpaonline.org

July 26-30, APS Centennial Annual Meeting, Minneapolis, MN, meeting.apsnet.org/

August 3-8, 93rd Ecological Society of America Annual Meeting, Milwaukee, WI, www.esa.org/milwaukee/

September 8-11, Pest and Native Thysanoptera of California and the Western USA: An ID Workshop, Riverside, CA, www.biocontrol.ucr.edu/Workshop/Thrips.html

September 14-18, Biodiversity in Agriculture: Domestication, Evolution, and Sustainability, Davis, CA, harlanii.ucdavis.edu/index.htm

September 15-19, Western International Forest Disease Work Conference, Missoula, MT, www.fs.fed.us/foresthealth/technology/wif/index.htm

September 16-18, Restoring the West Conference—Frontiers in Aspen Restoration, Utah State University, Logan, UT, www.restoringthewest.org

September 22-26, 16th Annual Ornamental Workshop—Diseases and Insects, Hendersonville, NC, www.cals.ncsu.edu/plantpath/activities/societies/ornamental/about_wkshop.html

March 24-26, 2009, 6th International IPM Symposium, Portland, OR, www.ipmcenters.org/ipmsymposium09/