Plant Disease and Insect Advisory

Entomology and Plant Pathology
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Suspicious patches in my lawn: Crop circles or large patch?

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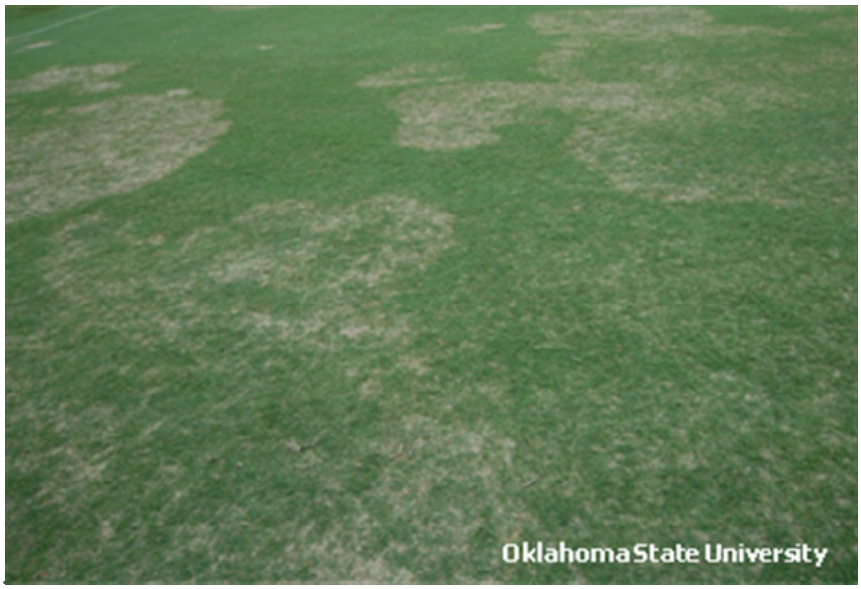
As the spring arrives and warm-season turfgrasses (bermudagrass, zoysiagrass, and St. Augustinegrass) begin to green up, homeowners, golf course superintendents, and landscape professionals have probably noticed an unusually high occurrence of large, thinning areas in these grasses. No, these are not crop circles. We are not being invaded by aliens overhead! These unusually large circles are caused by a soilborne fungus called *Rhizoctonia solani.* Fittingly, the common name of the resulting disease is large patch.

Large patch is an occasional disease of warm-season turfgrasses in Oklahoma. The disease can occur in residential, landscape, and recreational warm-season turfgrasses. In Oklahoma, the disease is most noticeable in early spring when turfgrasses are breaking dormancy and weather conditions are wet and mild. In some years, the disease is evident in the fall; however, activity by the pathogen may not always result in visible symptoms. This spring there have been numerous occurrences of the disease prompting several calls to OSU turfgrass pathologists for an explanation. We postulate that the unusually high occurrence of the disease this year is related to the mild, extremely wet 2007 growing season. Combine this with the wet, relatively cool spring this season and these conditions are extremely favorable for growth of the fungus and as a result, a high incidence of disease has been documented.



Symptoms of large patch on bermudagrass.

Symptoms and Signs

Affected areas may range from inches to many yards in length or diameter. The turf in affected areas will thin and individual grass leaves may appear bleached or yellow. Large circular, semi-circular, or arcs of damaged turf will be apparent. When the disease is active, the interface between healthy and diseased turf may appear bright orange. This is often most apparent on zoysiagrass. Leaf lesions, a white, cottony growth (mycelium) and smoke rings at the edge of the diseased areas will be absent. Patches are perennial, typically expand in size and often can reach several yards in diameter. Affected shoots can be easily pulled from sheaths or point of attachment and the base of the shoot may appear water soaked. As plant stand density is reduced, weed encroachment is common both during and after disease activity.

"Bronzing" symptoms exhibited by plants at the margin of an actively expanding patch.

Symptoms of an actively expanding patch caused by *R. solani*; note the weed encroachment in the thinning areas.

Causal Agent and Disease Cycle

The large patch fungus overwinters as dormant mycelium in infected plants or as special survival structures. The production of true spores does not occur. Therefore, spread of this fungus can occur through movement of infected plant parts or soil by equipment, people, animals, water, or wind. Epidemics are typically initiated when temperatures are mild and prolonged periods of high humidity exist. In Oklahoma, infection of susceptible grasses can begin in late September when soil temperatures are above 50° F and moisture is adequate and continue until dormancy. Fungal activity can resume in early spring but is suppressed by soil temperatures greater than 85° F.

Turfgrass grown under high nitrogen fertility that is applied too late in the year or very early in the spring is more prone to the development of large patch. Turfgrass that is excessively irrigated, has abundant thatch, or low air movement above the canopy, can be predisposed to disease. Extended periods of wet, mild weather can lead to severe epidemics. During summer months the disease subsides and the fungus typically survives in thatch or in resting structures.

Disease Management

Cultural Management: Large patch usually does not kill the stolons or rhizomes and surviving plants can fill in the affected areas during summer months. Do not apply nitrogen fertilizers in early spring when the pathogen is active; wait until soil temperatures are warmer. Do not apply nitrogen after September 15th. When water is required, apply a sufficient amount to wet the soil and then water as infrequently as possible without causing drought stress between irrigation events (Consult http://sip.mesonet.org/ for proper irrigation recommendations for your specific situation). Avoid frequent applications of small amounts of water, unless the water is used briefly to remove morning dew. When the disease is active do not conduct activities such as de-thatching or core aerification as this can spread the fungus. Wait and remove excessive thatch or aerify in the summer; these activities may help reduce disease severity. Very little is known about plant species resistant to large patch.

Chemical Management: Few effective fungicides are available over the counter for the homeowner to use for large patch management. However, effective fungicides are available to the professional turfgrass management community for large patch control. For chemical control to be effective, fungicides should be applied in the fall before disease development is evident. A repeated fungicide application 30 days later may be required if environmental conditions are still conducive for disease. It is recommended that the affected areas are photographed in the spring and that fall fungicide applications are targeted to only those areas where the disease was present. Spring applications are generally not effective. Fungicides should not be the only management tool. An integrated pest management (IPM) program that

combines cultural and chemical management and considering other potential pests should be used to manage large patch effectively without encouraging other turfgrass pest problems. For suggested fungicides, rates, and application intervals, refer to the current OSU Extension Agents' Handbook of Insect, Plant Disease, and Weed Control.

Africanized Honey Bees Continue to Move across the State

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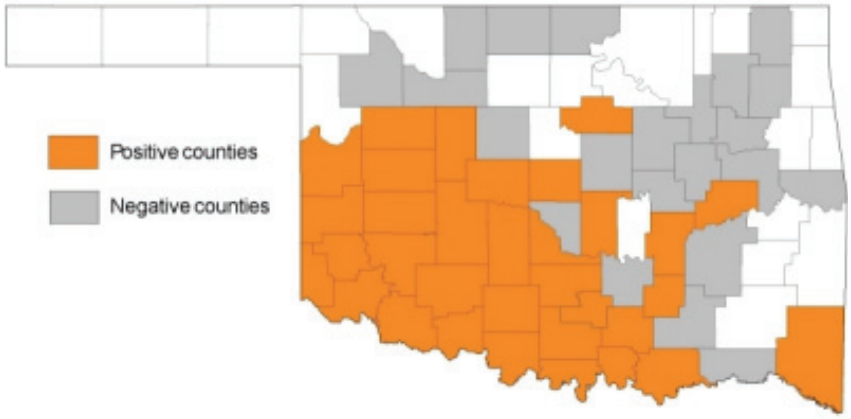
Bee samples from across the state continue to come into the diagnostics laboratory. Recently, after processing 10 negative samples from Payne County, the first positive sample for Africanized honey bees (AHB) was collected on April 23, 2008. The sample came from a daycare center where a swarm had settled on some playground equipment. Two additional locations have also been added to the pool of positive finds for 2008, Blaine and McCurtain Counties. All bees in these colonies were destroyed and no stinging incidences were reported. These last two discoveries provide some important benchmarks for the state. First, Payne county represents the farthest north this insect has been recovered. Second, McCurtain County marks the farthest southeastern location within the state that AHB has been recovered. Presently, we do not know how far north to expect these insects to become established. If records from Arizona are any indication, AHB is widespread across that state with colonies and swarms being found at very high elevations that are often snow-covered. It appears that nature can indeed find a way around many inhospitable situations. Presently we have mailed the samples collected from Payne County to the USDA-ARS Carl Hayden Bee Research Center in Arizona to have them perform a battery of measurements to further confirm that the specimens recovered are AHB. These results can often take several months, but the bottom line to the encroachment of this insect into our immediate area is the same as other areas, we are going to have to learn how to live with these insects. Following are some suggestions that can help in dealing with this insect.



The general public, particularly those associated with outside duties (mowing, gardening, tree trimming, etc.) should be aware that these insects could be widespread across Oklahoma and found in nearly any environment. AHB have been known to establish colonies in water meters, tires, barrels, gas barbeque grills, tree cavities, and in homes. From external appearance, AHB do not differ significantly from their more docile European (EHB) cousins; however, they can be very defensive in protecting their hive. AHB are more likely to attack intruders simply because of noise in the area (mowers, weed trimmers, blowers, chain saws, etc.). In addition, if they attack an intruder they are likely to do this with 6-10 times the number of workers stinging the victim than a EHB colony. Complicating the problem even more is that these defensive bees will

pursue an intruder further (up to ¼ mile) and stay angry longer (up to an hour) than European honey bees. Typically, disturbing colonies of established bees can always present a threat, regardless of their defensive tendencies; however, foraging honey bees are rarely a threat to anyone. If several honey bees are actively visiting blooms for nectar or pollen they are usually quite harmless unless someone attempts to threaten them. Even in situations where foraging bees may be threatened, the bees will often retreat or simply fly away. Established colonies, swarms and hives should be approached carefully and always with a personal retreat plan that includes enclosed shelter.

People who work outside, during the spring, summer and fall should be aware of their surroundings and cautious about approaching any potentially dangerous situation involving honey bees. We recommend that people associated with outside duties involving noisy equipment take the time to assess the area before starting up their equipment. Any large crews of workers that trim trees or similar jobs should have an evacuation plan mapped out beforehand and have a vehicle nearby. This particular safety issue can also justify the purchase of several bee suits, in case an emergency occurs. Any worker that has a history of allergic reaction to insect stings or bites should notify his employer and always carry their reaction kit with them into any potentially dangerous situation.

Oklahoma State University in cooperation with the Oklahoma Department of Agriculture, Food and Forestry will continue to assess samples throughout the state; however, where a positive collection has taken place that county is considered infested with AHB and the cost of any subsequent testing may be passed on to the landowner.

For those in need of additional information on Africanized honey bees and related species, consult our website at: http://entoplp.okstate.edu/ahb/ or the Oklahoma Department of Agriculture, Food, and Forestry website at: http://www.state.ok.us/~okag/cps-beeshome.htm.

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