



Pest e-alerts



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Bagworm and Fall Webworm Management

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So far, 2010 is proving to be another big year for caterpillar pests in Oklahoma. My inbox and voicemail have been full of messages the past two weeks with requests for information about bagworms and fall webworms. These two caterpillar species are commonly encountered defoliating many of our favorite landscape trees and shrubs.



Bagworms

Description: The common bagworm, *Thyridopteryx ephemeraeformis*, is discovered most frequently in its larval form, feeding on trees from within a silken bag it constructs from foliage and other plant tissues (hence, the common name of bagworm) (Fig. 1). Adult males are small moths with a black, hairy body and clear wings with a wingspan of about 1 inch (25 mm). Adult females are wingless, have no functional legs, eyes, or antennae, and are almost maggot-like in appearance. The female's body is soft, yellowish white, and practically naked except for a circle of woolly hairs at the posterior end of the abdomen. Mature larvae are about 1 inch (25 mm) long and have a dark brown abdomen, while the head and thorax are white with black spots. Both larvae and adult females are found within bags on their host plants.

Fig 1. Bagworm on pine. PA Dept. of Conservation and Natural Resources, Forestry Archive, Bugwood.org

Distribution: Bagworms are found in most states east of the Rocky Mountains. It is most common from Pennsylvania to Nebraska and south to Florida and Texas. It is common in all areas of Oklahoma.

Life Cycle: Overwintered eggs (contained within the bags of 1-year-old females) begin to hatch in late April or early May and young larvae begin to feed and construct bags immediately. The first evidence of an infestation is normally a small bag, about 1/4 inch (6.5 mm) long, standing almost on end. As larvae grow, silk and fragments of the host plant foliage are added to the bag until it reaches 1 1/2 to 2 inches (38 to 51 mm) long. When larvae are mature they fasten the bag to a plant stem with silk. Pupation occurs in the bag in late summer and males emerge in late summer to early fall. They engage in a mating flight in search of the wingless females, who remain inside their bags. After mating the female lays several hundred white eggs inside her old pupal case, drops from the bag, and dies. There is one generation per year.

Hosts: In Oklahoma, the most common hosts are eastern red cedar, other junipers, and arborvitae. They sometimes damage pines, spruce, bald cypress, maple, boxelder, sycamore, willow, black locust, oaks, and roses. The bagworm has been recorded on 128 different plant species in various parts of the United States.

Damage: Bagworm larvae damage their hosts by feeding on the foliage. Heavy infestations can completely defoliate small plants. Defoliation usually kills hosts such as red cedar and other junipers. Broadleaf hosts are not killed but are weakened and become more susceptible to woodboring insects and pathogens.

Cultural control: Infestations can be reduced by handpicking bags (and overwintering eggs within bags) during fall, winter, or spring before eggs hatch. Eggs remain viable within bags so be sure to destroy bags upon removal by burning them. When larvae become active, bagworms can still be removed by hand if the numbers are small and the affected host plants are small enough to reach the canopy. Again, take care to destroy the bags once they are removed.

Biological control: There are several naturally occurring parasitic wasps and predatory insects that attack bagworms. The activity of these natural enemies apparently explains the fluctuation in bagworm populations observed from year to year.

Chemical control: Chemical controls are most effective if applied early when larva are small. In Oklahoma, it is normally a good practice to make applications of insecticide by early June. *Bacillus thuringiensis* var. *kurstaki*, a bacterial insecticide, is reported to provide good control of bagworms. Also effective are products that contain the active ingredient spinosad, another microbial agent. These insecticides must be ingested by the caterpillars in order to achieve kill, so be patient as it will take some time to see results. Repeat applications may be needed later in the summer in order to keep susceptible plants free of bagworms. This is not due to the occurrence of multiple generations. Rather, not all eggs will hatch at the same time in some

years and there may be migration of larvae between host plants. In most years, treatment in early June will catch most of the emerging larvae and provide fairly good, season-long control. The larger, older larvae can be controlled with products containing acephate (Orthene), carbaryl (Sevin), bifenthrin, cyfluthrin, and lambda-cyhalothrin.



Fig. 2. Fall webworm larvae and webbing

Fall Webworms

Description: Fall webworm, *Hyphantria cunea*, is most commonly observed feeding in groups on the foliage of host plants from within a web constructed on branch terminals (Fig. 2). Webs are most prominent in late summer or early fall, but in outbreak years their webs are noticeable earlier in the summer. Adult moths are almost pure white and have a wingspread of about 1 1/4 inches (32 mm). Some

specimens have the front wings more or less heavily marked with small black spots. Larvae may be pale yellow, yellowish green, greenish, or orange but most have two rows of black spots down the back. The head may be red or black. The body is rather sparsely covered with long white hairs.

Distribution: Fall webworms are found over most of Canada and the United States and into northern Mexico. They are present over all of Oklahoma but are more common in the east than the west.

Life Cycle: Adults of the overwintering generation emerge during May or occasionally in late April. Egg laying occurs in late May and early June. Each female can lay 400 to 500 eggs in masses on the underside of leaves. Egg masses are covered with white hairs from the female's abdomen and may have a pale green background color. Two races or forms of the larvae occur in Oklahoma. The blackheaded form possesses a black head capsule and black tubercles on the body (Fig. 3). Larvae of this form generally begin hatching in May and immediately begin spinning the web in which they feed. The web is extended as larvae grow. Larvae mature and leave host trees to pupate in late June. There are three generations of the blackheaded form per year. The head and tubercles of the redheaded form are orange (Fig. 4). This form is more commonly encountered on pecan and persimmon in Oklahoma. First-generation adults emerge during July and second-generation larvae are present from late July into early October. The

second-generation larvae overwinter as pupae below the soil. There are two generations of the redheaded form per year.



Fig 3. Blackheaded race of fall webworm. Lacy L. Hyche, Auburn University, Bugwood.org.



Fig 4. Redheaded race of fall webworm. Whitney Cranshaw, Colorado State University, Bugwood.org.

Hosts: The fall webworm has been recorded on at least 88 species of shade, fruit, and ornamental trees in the United States. The preferred hosts vary from one area to another. In Oklahoma, persimmon and pecan are most commonly infested and black walnut and hickory are also common hosts. Sycamore, birch, and redbud are often attacked in years of heavy infestations. Infestations on cottonwood, American elm, and bald cypress have been reported. The black-headed form is sometimes common on sweetgum.

Damage: Damage is caused by the larvae feeding on the leaves. They rarely are heavy enough to defoliate trees except for young pecans and persimmons. On most forest and shade trees, the insect is detrimental mainly to the beauty of the host and is thus more of a nuisance than a threat to the health of the tree. Actual damage can occur on pecan as defoliation affects tree vigor, yield, and nut quality. The earlier defoliation occurs, the more harmful the damage.

Control is rarely warranted for fall webworm because it is usually a nuisance pest. However, control may be necessary to protect pecan yield and tree vigor.

Cultural control: Larvae and their webs may be cut out of small trees and destroyed, but larger trees with webs present high in the canopy should be treated with insecticide to achieve control.

Biological control: More than 50 species of parasites and 36 species of predators attack fall webworm in North America. These natural enemies occur naturally and likely contribute to regulating fall webworm populations in non-outbreak years.

Chemical control: When using conventional insecticides that rely on contact, sufficient spray pressure is needed to reach and penetrate the webs of these caterpillars. Several insecticides will normally provide control if adequate spray penetrates the webbing. A biorational approach to managing webworms can include the use of *Bacillus thuringiensis* var. *kurstaki*, a bacterial insecticide, or products containing an insect growth regulator (e.g., tebufenozide, methoxyfenozide) that are specific to caterpillar pests. Either of these latter materials can be applied near the webbing area and the caterpillars will eventually expand their feeding into the treatment zone. However, products containing these insect growth regulators can only be purchased and applied by a licensed pesticide applicator.

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Soybean Disease Update

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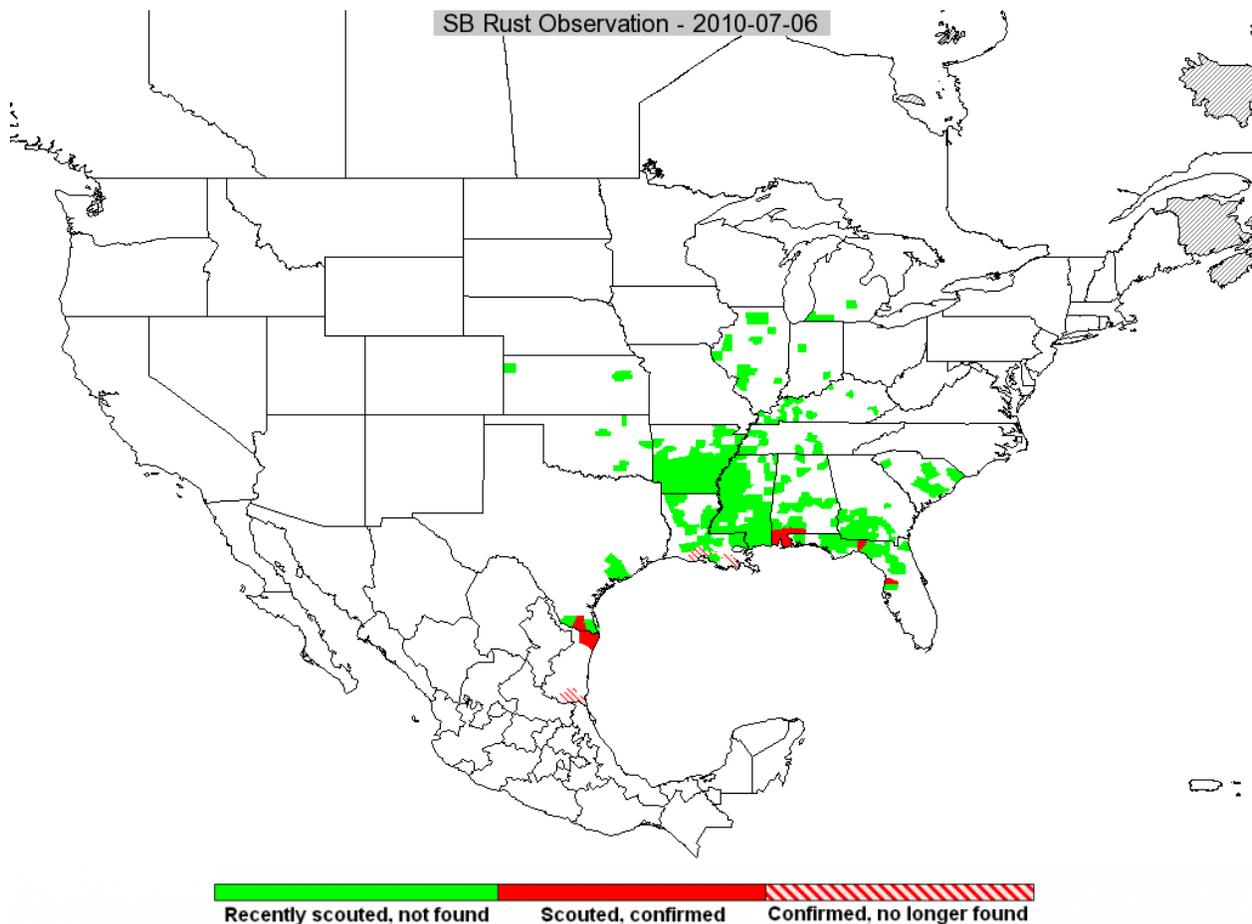


Soybean Rust

Soybean rust (left) is an invasive foliar disease of soybeans that has caused serious damage on soybeans in the southeastern U.S., but minor losses elsewhere in the U.S. since the disease was first found in this country in 2004. Because soybean rust does not overwinter north of the frost line and it is difficult to detect in its early stages of development, a rust-monitoring network has been in place since 2005 with the purpose of warning soybean producers about potential soybean rust epidemics. Oklahoma receives funding from the North Central Soybean Research Program (NCRSP) to support rust monitoring

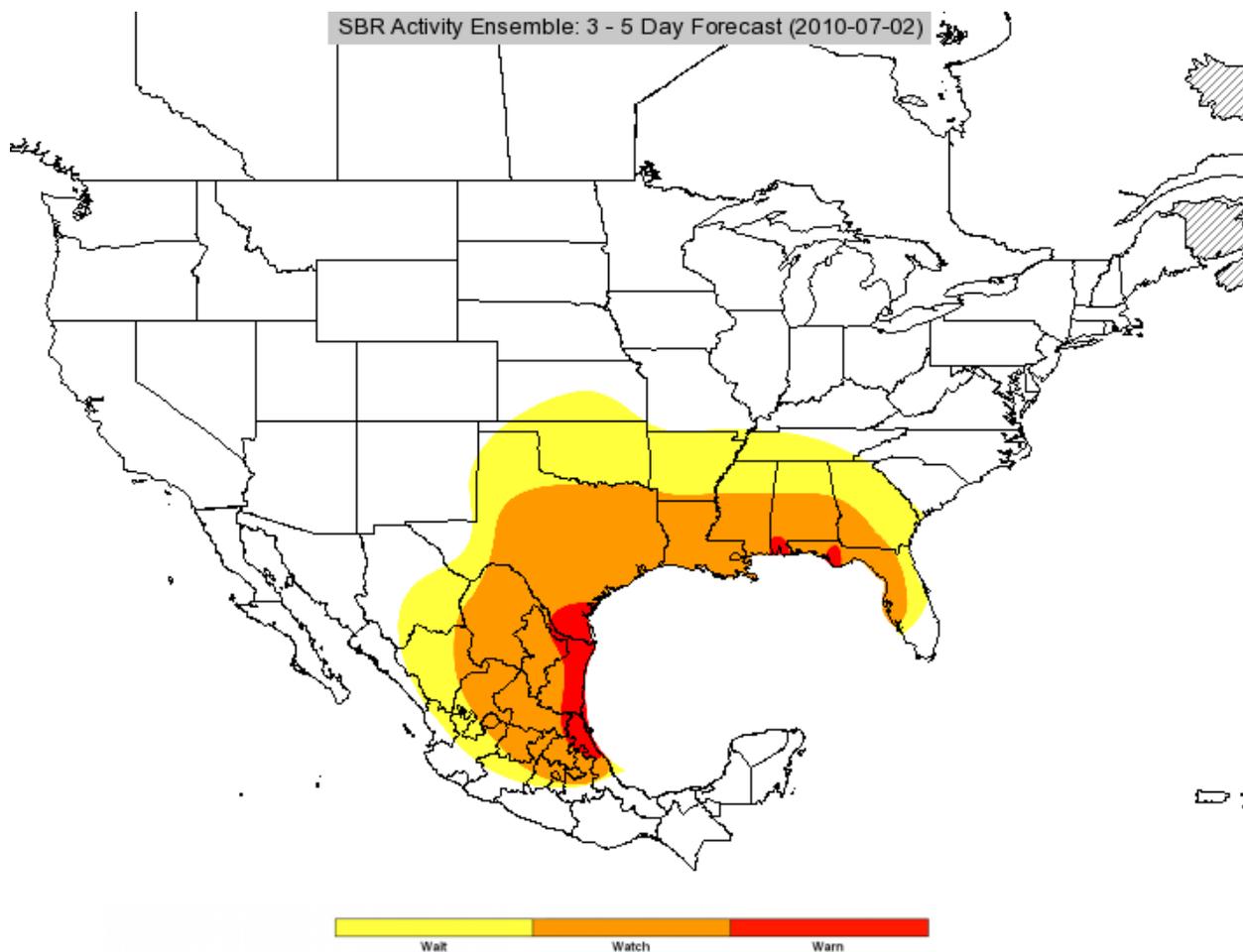
because of its strategic location just south of states that have large soybean acreages.

In the U.S., soybean rust development in 2001 is behind that of past years. It is assumed that the cold winter in the southern U.S. greatly reduced surviving sources of rust spores on kudzu and other overwintering hosts. Currently, soybean rust is active only in south Texas, south Alabama, and Florida (see map below). The Florida and Alabama rust outbreaks were just recently detected. In Oklahoma, soybean rust monitoring sites are located in Atoka, Bryan, Choctaw, Hughes, Okmulgee, Payne, Sequoyah, Wagoner, and Washington Counties. To date, samples received from Atoka, Payne, Sequoyah, and Washington counties have been negative. The current map forecast for rust development in Oklahoma include wait and watch levels (see map next page). Rust has not been found in Oklahoma until the warn level has been reached.



The effects of Hurricane Alex on soybean rust is currently expected to be minimal except that rain and cloudy weather will likely increase local rust development in south Texas, providing more inoculum for northward spread later in the year. Historical weather patterns have not supported much northern movement of rust in July. The reason given for the small impact of Hurricane Alex on soybean rust spread is the very low level of rust spores available for long-range transport. If by chance current rust levels have been underestimated by 100x, then rust

spores could reach Arkansas as a result of Hurricane Alex. A 10x underestimation of rust spore potential would have little impact on current forecasts. Time will tell about the impact of Hurricane Alex on soybean rust development. It is currently not necessary to spray soybeans with fungicide to control rust. The status of soybean rust in Oklahoma and surrounding states can be monitored at <http://sbr.ipmpipe.org>.



Septoria Brown Spot

Brown spot (right) is the most common foliar disease of soybean in Oklahoma. It can be found in almost every old soybean field early in the season when it is most conspicuous. Early season rains in May and June favor heavy brown spot levels in fields previously cropped to soybeans. On small vegetative plants,



brown spot causes conspicuous yellowing and defoliation of the lower leaves (below). From 25 to 50% of the leaves may be affected by the time plants bloom when conditions favor disease development. Brown spot appears to subside later in the season as plants produce lots of new leaves and appear to grow out of the problem. In Oklahoma and other soybean producing states, fungicides sprays applied at early pod set have not resulted in yield increases in fungicide trials where brown spot is present. Brown spot is showing up in many old soybean fields again this year, but we do not recommend fungicides sprays for this disease.



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