

The Oklahoma Cooperative Extension Service WE ARE OKLAHOMA

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education

for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.

- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.



Mites in Small Grains

EXTENSION

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Mites

Mites are not insects, but are closely related to spiders and ticks. Some mites are predaceous, while others are plant feeders. Three plant-feeding mites are commonly found on winter wheat in Oklahoma, occasionally injuring wheat crops. Each mite has a specific biology and different strategies are required to effectively manage them.

Brown Wheat Mite (*Petrobia latens*)

The brown wheat mite occurs statewide, but is more common in the western and panhandle counties. Brown wheat mites are about the size of a period on newsprint (less than 1/50 inch). They have dark brown bodies with four pairs of light brown to yellow legs. The forelegs are twice as long as the remaining 3 pairs (Figure 1).

This mite spends the summer as a dormant, white egg, which hatches in the fall (Figure 2). These mites feed and adults produce red eggs that hatch in about seven days at 72 F. From fall through spring there are multiple generations, each cycling about 21 days, depending on temperatures. Population numbers generally peak in spring. Females of the last generation lay white eggs in the soil that will diapause through the summer and hatch the following fall.

Oklahoma Cooperative Extension Fact Sheets are also available on our website at: extension.okstate.edu



Photo courtesy Richard Grantham.

Figure 2. Brown Wheat Mite (BMW) eggs.

Brown wheat mites are more prevalent during dry weather, and injury symptoms can be confused with drought stress. They feed by piercing plant cells in the leaf, resulting in "stippling." Wheat plants infested with brown wheat mites appear scorched or bronzed and withered (Figure 3). Brown wheat mite activity is greatest in the afternoon on warm days. An easy way to inspect for brown wheat mite is to shake some plants onto a white piece of paper, making the mites easy to observe.

This mite is more often a problem with continuous wheat production systems. Crop rotation with canola can be an effective deterrent. Precipitation and temperature can affect brown wheat mite buildup. Rainfall of greater than 0.25 inch will often reduce mite populations and plant stress. Research suggests a treatment threshold of 25 to 50 brown wheat mites per leaf in wheat that is 6 inches to 9 inches tall is economically warranted. An alternative estimation is "several hundred" per foot of row. While there are effective acaricides registered to control the brown wheat mite, these acaricides are often less effective when plants are drought stressed. For current acaricide recommendations, consult Extension Fact Sheet EPP-7194 *Management of Insect and Mite Pests of Small Grains*.



Photo courtesy Richard Grantham.

Figure 1. Brown Wheat Mite (BWM).

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Figure 3. Brown Wheat Mite (BWM) Damage.

Winter Grain Mite (*Penthaleus major*)

The winter grain mite is commonly found throughout the state, except for the panhandle. It is slightly larger than the brown wheat mite, measuring 1/32 inch to 1/16 inch. It has a dark blue to black body and has orange-red legs and an orange or red spot on the upper abdomen (Figure 4). The front pair of legs are slightly longer than the other three pair.

Winter grain mites spend the summer as kidney-shaped eggs, typically attached to leaf blades or soil, that hatch in the fall (Figure 5). There are two generations, the first beginning in fall and the second from eggs laid in January and February. In all cases, the mites are female, which can lay eggs cycling about 21 days, depending on temperature. Winter grain mites



Figure 4 Winter Grain Mite (WGM).



Figure 5. Winter Grain Mite (WGM) Eggs.

thrive under wet, cool conditions and populations decline with warmer temperatures.

This mite is associated with continuous wheat production systems. Wheat fields infested with winter grain mites take on a silvery-gray color and the leaf tips may turn brown, and plants may become stunted (Figure 6). Winter grain mites are more visible on cloudy days or in the morning or evening. They hide under clods or just beneath the soil crust during daylight hours. An easy way to inspect for winter grain mite is to shake some plants onto a white piece of paper, making them easy to observe. During the day, use a magnifying glass to inspect the base of wheat plants and under dirt clods. Control is not usually required, but there are effective acaricides available. An acaricide treatment should be considered when plants show visible injury and mites are still present. For current acaricide recommendations, consult Extension Fact Sheet EPP 7194 *Management of Insect and Mite Pests of Small Grains*.

Wheat Curl Mite (*Aceria tosichella*)

The wheat curl mite occurs throughout Oklahoma, but is more prevalent west of Interstate 35. The wheat curl mite is a whitish colored, sausage-shaped mite measuring about 1/100 inch and has two pair of legs located near the head (Figure 7).



Figure 6. Winter Grain Mite (WGM) damage.

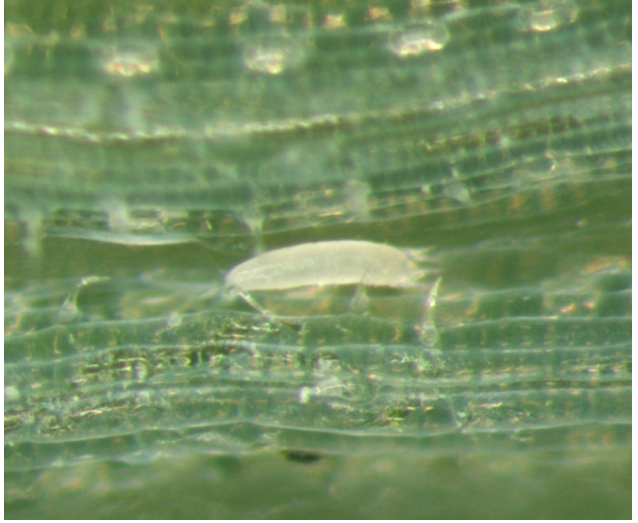


Figure 7. Wheat Curl Mite (WCM).

Wheat curl mites prefer to feed on terminal leaves and the most tender leaf tissue, and will move to newly emerging leaves. They lay eggs along leaf veins. Under optimal conditions (75 F to 85 F), wheat curl mites can complete a generation in 10

days. As they feed, they cause the outer margins of leaves to roll up and the mites reside within those tight rolls. When plants begin to dry down, they move to the flag leaf or head and are carried by the wind to their over-summering grass hosts. The reverse occurs when their summer hosts dry down — they move back to wheat. Besides winter wheat, wheat curl mite feeds on maize and several weed grasses including western wheatgrass, jointed goatgrass, sandbur, Canada wildrye, barnyard grass, stinkgrass, witchgrass and green foxtail

The mites can be seen with a 10X magnifying lens by carefully unrolling the leaves. While the physical damage from their feeding can cause problems, the most important damage are the vectors of viruses they carry causing Wheat streak mosaic (WSM), High plains disease (HPD) and Triticum mosaic (TrM). All three diseases can cause severe problems when infections are heavy. For more information on these mite transmitted virus diseases, consult Extension Fact Sheet EPP-7328: *Wheat Streak Mosaic, High Plains Disease and Triticum Mosaic: Three Virus Diseases of Wheat in Oklahoma*.

Unfortunately, chemical control options for wheat curl mite are not effective. Management options include destruction of volunteer wheat AT LEAST TWO WEEKS PRIOR TO PLANTING, planting later in the fall and selecting WSM resistant varieties. Wheat varieties resistant to WSM and other diseases are listed in Extension Fact Sheet PPS-2142 2012: *Wheat Variety Comparison*.