Plant Protection Programs University of Missouri

Integrated Pest & Crop Management

Wheat Disease Update

By Laura Sweets

Although we have not received very many wheat samples so far this season, there have been a number of phone calls related to possible disease problems and fungicide application. Of the few samples that have come in, Septoria leaf blotch was evident on one and several have tested positive for either strains of barley yellow dwarf or wheat soil-borne mosaic virus. In wheat trials in the Columbia area, Septoria leaf blotch is beginning to develop and leaf rust is just beginning to develop on susceptible varieties.

Stage of growth of wheat varies greatly across the state and even within regions of the state. In southern Missouri many fields are beginning to head and in southeast Missouri some fields may be flowering. The rate at which a field moves from the boot stage to flowering can be influenced by temperature. At warmer temperatures the crop can move quickly through those growth stages. At cooler temperatures, the crop may move very slowly from boot to flowering. The increase in foliage diseases such as Septoria leaf blotch and leaf rust as well as the head disease scab or Fusarium head blight will be determined by precipitation and humidity as well as temperature. Forecasts vary from one rain event over the next 5-7 days to multiple rain events over the next 5-7 days. Frequent light rains, high humidity, extended periods of overcast weather, and moisture that stays in the canopy will favor the increase of foliage diseases and Fusarium head blight.

If growers are considering fungicide application, now is the time to be scouting fields to determine incidence and severity of any fungal foliage diseases which might be showing up and to accurately assess the stage of growth of each field. Most of the fungicides for control of fungal foliage diseases should be applied by Feekes growth stage 10.5 and fungicides for the suppression of Fusarium head blight should be applied at Feekes growth stage 10.51. Descriptions of wheat foliage diseases, Fusarium head blight or scab as well as several tables on wheat fungicides can be found in the last two issues of the Integrated Pest and Crop Management Newsletter. It is also important to remember that all of these fungicides have restrictions as to how late in the season they can legally be applied. Two of the most common label restrictions are "no later than Feekes 10.5" and "do not apply within 30 days of harvest". Violation of these preharvest intervals led to serious problems in some states last year. Read and follow label directions for any product used on wheat. The bottom line on fungicide application for control of foliar diseases or suppression of Fusarium head blight is that growers in the southern part of the state need to be making those decisions right now before the crop is past Feekes 10.5 or 10.51 and growers in the central and northern areas of the state will be facing those decisions in the next 7-14 days.

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True Armyworm Larvae Emerge in Southwest Missouri

By Wayne Bailey

The elevated true armyworm, Mythimna unipuncta, moth numbers observed in Southwest Missouri during past weeks have resulted in the emergence of numerous larvae from eggs this past week. Jay Chism, regional agronomy specialist in Barton County, reported the presence of very small larvae (1st and 2nd instars) in some wheat fields in the Lamar area. Wheat, tall fescue, grass pastures, and occasionally field corn are all hosts of true armyworm larvae. This insect rapidly grows through approximately 7 or more worm stages (instars) as they develop from egg to adult moth. The early instars avoid light and spend much time close to the soil surface and on lower plant foliage. Feeding by early instars is usually minimal, but the amount of damage they cause rapidly increases as the larvae increase in size and move upward on host plants. A total of 2-3 generations may be produced each season, but only the first generation generally causes problems in grass crops and pastures. Later generation larvae tend to move to turf to feed and develop. When numerous moths are produced by numerous larvae, they are readily found around lights and in grass foliage. In past years numbers of moths emerging from the first generation larvae caused problems at several night ball games and other events by flying in extremely high numbers around the lights. Larvae may also cause problems on highways when they move in mass (like their armyworm name implies) and are killed by vehicle traffic. Large slick spots on the road surfaces may form and result in vehicle accidents. True armyworm larvae do not feed on legumes, only grasses.

Scouting: Larvae of true armyworm are often active at night or on cloudy days as they avoid light. To determine the presence of small larvae scout plant debris on the ground and for feeding damage on lower plant foliage. As larvae increase in size, they will feed during both night and day periods and move upward on host plants as they consume foliage. Larvae are relatively easy to identify as this insect has four pairs of abdominal prolegs located on the abdomen near the tail end of the worm and an addition pair of anal prolegs located at the very tail of the insect. The indentifying characteristic to look for is a dark brown to black triangle located on each of the 8 feet of the four pairs of abdominal prolegs. Another identifying characteristic is the presence of a broad orange or salmon colored line running down each side of a larva from head to tail.

Economic Threshold: (corrected threshold for field corn)

Tall Fescue and Grass Pastures: Occasional severe pest of grass seed and forage fields. Treat when an average of 4 or more half-grown or larger worms (½ inch to 1 ½ inch larvae) per square foot are present during late spring and before more than 2% to 3% of seed heads are cut from stems.

Wheat: Treat when an average of 4 or more half-grown or larger worms per square foot are present during late spring and before more than 2% to 3% of seed heads are cut from stems.

Field Corn: Treat seedling corn when 25% or more of plants are being damaged. Control is justified after pollen shed if leaves above ear zone are being consumed by larvae.

Potential Black Cutworm Problems Elevated for Central, Northeast, and Southeast Counties.

Captures of black cutworm moths during past weeks may result in cutting of corn plants by this pest beginning next week. The highest captures have been in Northeast Missouri where numbers of moths collected at the Greenley Center have been extremely high. Audrain and Callaway counties in Central Missouri and several traps in Southeast Missouri also report elevated numbers of moths. Although no reports of larval damage from black cutworm have been reported at this time, the potential for damage in areas receiving high numbers of moths does exist. To see the trap captures and predicted dates of first cutting by 4th instar black cutworm go to www.IPM.missouri.edu. Leaf feeding is often visible in black cutworm infested fields about 7 days prior to first cutting. The economic threshold for black cutworm suggests that 2-3% or more of seedling corn plants cut justifies the application of a rescue insecticide. Late planted corn is most at risk as large worms can cause severe injury to small corn seedlings. Seed treatments (250 rate) will provide up to about 50% control of this pest in most fields.

Greenbug and Oat Bird Cherry Aphids in Wheat Fields

Most wheat fields in Missouri are supporting populations of these two aphids, although beneficial insects such as ladybird beetles are helping to reduce pest numbers. Both aphid species can transmit Barley Yellow Dwarf disease, although this transmission causes more severe problems in wheat when infections are transmitted to wheat plants during fall and less so during spring seasons. Both aphids also cause direct damage to wheat plants by using their piercing-sucking mouthparts to suck and feed on plant juices.

The greenbug aphid is a traditional pest of wheat in Missouri after being transported into the state by winds blowing in from more southern locations. This aphid does not overwinter in Missouri, but populations may build to economic levels anytime during the growing season. The greenbug is a small, pear-shaped, pale yellow to pale green, 1/16-inch aphid with a distinct dark green line running the

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True Armyworm Larvae Emerge in Southwest Missouri *continued from page 56*

length of the body. The legs, cornicle (tailpipes), eyes are black in color. This aphid is often found in small colonies on the leaf surface of wheat. They tend to be problems in fall of year when conditions are mild and dry. They often initially produce red speckling at the feeding site, but may cause plant stunting to plant death.

The bird cherry-oat aphid is olive green in color with reddish-orange coloring surrounding the base of cornicles. Both species of aphids are born alive and can produce a generation about every 7-10 days when conditions are favorable. The antennae, eyes, tips of legs, and cornicles are black in color. This aphid can be found throughout the year in Missouri as it is capable of overwintering in most years.

The economic thresholds for the greenbug aphid is 25-50 aphids or more from emergence to jointing and 7-15 bird cherry-oat aphids or more during the fall and 12-25 aphids or more during spring. Scouting for greenbug aphids is easier as they tend to be in colonies on leaf surfaces. In contrast, the bird cherry-oat aphids tend to be found low in the plant canopy and found as individuals scattered over leaf surfaces. During winter this aphid often overwinters in plant debris near plant crowns.

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Table 1. True Armyworm - Field Corn

Insecticides Labeled for Use on True Armyworm in Field Corn

Comments: Treat seedling corn when 25% or more of plants are being damaged. Control is justified after pollen shed if leaves above ear zone are being consumed by larvae. Optimal control from Success or Tracer is best achieved when the insecticide is applied at peak egg hatch or when larvae are small.

Common Name	*Trade Name*	*Rate of formulated material per acre*	*Placement*
permethrin	***Ambush 25W**	6.4 to 12.8 fl. oz.	broadcast
esfenvalerate	***Asana XL**	5.8 to 9.6 fl. oz.	broadcast
cyfluthrin	***Baythroid XL**	1.6 to 2.8 fl. oz.	broadcast (for 1st and 2nd instars only
bifenthrin	***Brigade 2EC** ***Brigade 2EC** ***Brigade 2EC**	2.1 to 6.4 fl. oz. 2.56 fl. oz. 3.0 to 4.0 fl. oz.	broadcast PRE (pre-emergence) PPI (pre-plant incorporated)
bifenthrin	***Capture LFR** ***Capture LFR** ***Capture LFR**	3.4 to 6.8 fl. oz. 3.4 fl. oz. 4.0 to 5.3 fl. oz.	broadcast, band, in-furrow PRE (pre-emergence) PPI (pre-plant incorporated)
chlorpyrifos + gamma-cyhalothrin	***Cobalt**	13 to 26 fl. oz.	broadcast
bifenthrin	***Fanfare 2EC**	2.1 to 6.4 fl. oz.	broadcast
zeta-cypermethrin + bifenthrin	***Hero**	4.0 to 10.3 fl. oz.	broadcast
methoxyfenozide	**Intrepid 2F**	4.0 to 8.0 fl. oz.	broadcast
methomyl	***Lannate LV**	0.75 to 1.5 pt.	broadcast
chlorpyrifos	***Lorsban 4E**	1 to 2 pt.	broadcast
chlorpyrifos	***Lorsban Advanced** ***Lorsban Advanced**	1 to 2 pt. 1 to 2 pt.	preplant, at-plant, preemergence postemergence
zeta-cypermethrin	***Mustang Max**	3.2 to 4.0 fl. oz.	broadcast
chlorpyrifos	***Nufos 4E**	1 to 2 pt.	broadcast
microencapsulated methyl parathion	***Penncap-M**	2.3 pt.	broadcast
permethrin	***pounce 3.2EC**	4.0 to 8.0 fl. oz.	broadcast
lambda-cyhalothrin	***Proaxis**	2.56 to 3.84 fl. oz.	broadcast
carbaryl	**Sevin XLR Plus**	2 to 4 pt.	broadcast
spinosad	**Success**	3.0 to 6.0 fl. oz.	broadcast
spinosad	**Tracer 4SC**	1.0 to 3.0 fl. oz.	broadcast

* **Designates a restricted-use pesticide. Use is restricted to certified applicators only.** Regardless of the formulation selected, read the label to determine appropriated insecticide rates, directions, precautions, and restrictions.

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Table 2. True Armyworm - Grass Pastures

Insecticides Labeled for Use on True Armyworm in Grass Pastures			
Comments: Often a pest of tall fescue and grass pastures. Treat when an average of four or more half-grown or larger worms per square foot are present during late spring and before more than 2% to 3% of heads are cut from stems. Scout at dusk, dawn, or at night as small larvae feed on foliage at night and remain in plant debris near ground during day.			
Common Name	***Trade Name***	***Rate of formulated material per acre***	***Placement***
carbaryl	**Sevin XLR Plus**	2 to 3 pt.	broadcast
malathion	**57% Malathion**	1.5 to 2 pt.	broadcast
zeta-cypermethrin	***Mustang Max**	2.8 to 4.0 fl. oz.	broadcast

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Table 3. True Armyworm - Wheat

Insecticides Labeled for Use on True Armyworm in Grass Pastures			
Comments: When an average of 4 or more half-grown or larger worms per square foot are present during late spring and before more than 2% to 3% of heads are cut from stems. Scout at dusk, dawn, or at night as small larvae feed on foliage at night and remain in plant debris near ground during day. Optimal control from Success and Tracer insecticides is best achieved when they are applied at peak egg hatch or when larvae are small.			
Common Name	***Trade Name***	***Rate of formulated material per acre***	***Placement***
lambda-cyhalothrin	***Karate**	1.28 to 1.92 fl. oz.	On foliage
methomyl	***Lannate LV**	3/4 to 1-1/2 pt.	
zeta-cypermethrin	***Mustang Max**	3.2 to 4.0 fl. oz.	
microencapsulated methyl parathion	***Penncap-M**	2 to 3 pt.	
lambda-cyhalothrin	***Proaxis**	2.56 to 3.84 fl. oz.	
carbaryl	**Sevin XLR Plus**	2 to 3 pt.	
spinosad	**Success**	3.0 to 6.0 fl. oz.	
spinosad	**Tracer 4SC**	1.0 to 3.0 fl. oz.	
lambda-cyhalothrin	***Warrior**	2.56 to 3.84 fl. oz.	

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Table 4. Black Cutworm

Insecticides Labeled for Use on Black Cutworm			
Comments: Apply as postemergence rescue treatment when 1% to 2% are more of plants have been cut below ground or 2-3% of plants cut above ground and larvae are present. Corn planted late into fields supporting winter annual weeds such as henbit and chickweed is at greater risk.			
Common Name	***Trade Name***	***Rate of formulated material per acre***	***Placement***
permethrin	***Ambush 25W**	6.4 to 12.8 fl. oz.	broadcast
esfenvalerate	***Asana XL**	5.8 to 9.6 fl. oz.	broadcast
cyfluthrin	***Baythroid XL**	0.8 to 1.6 fl. oz.	broadcast
bifenthrin	***Brigade 2EC** ***Brigade 2EC** ***Brigade 2EC**	2.1 to 6.4 fl. oz. 2.56 fl. oz. 3.0 to 4.0 fl. oz.	broadcast PRE (pre-emergence) PPI (pre-plant incorporated)
bifenthrin	***Capture LFR** ***Capture LFR** ***Capture LFR**	3.4 to 6.8 fl. oz. 4.0 to 5.3 fl. oz. 3.4 fl. oz.	broadcast, band, in-furrow PRE (pre-emergence) PPI (pre-plant incorporated)
chlorpyrifos +gamma-cyhalothrin	***Cobalt**	13. to 26 fl. oz.	broadcast
zeta-cypermethrin +bifenthrin	***Mustang Max** ***Mustang Max**	1.2 to 2.8 fl. oz. 2.88 fl. oz.	broadcast At plant (30-inch row)
chlorpyrifos	***Nufos 4E**	1 to 2 pt.	broadcast
permethrin	***Pounce 3.2EC**	4.0 to 8.0 fl. oz.	broadcast
lambda-cyhalothrin	***Proaxis**	1.92 to 3.2 fl. oz.	broadcast
lambda-cyhalothrin	***Warrior**	1.92 to 3.2 fl. oz.	broadcast

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Table 5. Greenbug and Bird Cherry-Oat Aphids in Wheat

Insecticides Labeled for Use on Greenbug and Bird Cherry-Oat Aphids in Wheat			
Comments: none			
Common Name	***Trade Name***	***Rate of formulated material per acre***	***Placement***
Cyfluthrin	***Baythroid XL**	1.8 to 2.4 fl. oz.	On foliage
chlorpyrifos + Gamma cyhalothrin	***Cobalt**	7 to 13 fl. oz.	
dimethoate	***Dimethoate 4EC**	1/2 to 3/4 pt.	
methomyl	***Lannate LV**	3/4 to 1-1/2 pt.	
chlorpyrifos	***Lorsban 4E**	1/2 to 1 pt.	
zeta-cypermethrin	***Mustang Max**	3/2 to 4.0 fl. oz.	
microencapsulated methyl parathion	***Penncap-M**	2 to 3 pt.	
chlorpyrifos	***Nufos 4E**	1/2 to 1 pt.	
lambda-cyhalothrin	***Proaxis**	2.56 to 3.84 fl. oz.	
lambda-cyhalothrin	***Warrior**	2.56 to 3.84 fl. oz.	
Seed Treatments			
imidacloprid	**Gaucho**	See product label	Commercially applied on seed
thiamethoxam	**Cruiser**	See product label	Commercially applied on seed

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Seed Decay and Seedling Blights of Corn

By Laura Sweets

Some years, early season stand establishment problems are widespread and, in some cases, severe- especially in early planted field corn. The weather pattern during and immediately after planting is a major factor contributing to those problems. Corn planted before extended periods of cold, wet weather in April or early May tends to show damage from saturated soils, cold soil temperatures, frost injury, herbicide injury, nitrogen deficiencies, seed decay and seedling blights. In some fields the seed decay and seedling blight may progress into crown decay resulting in even more severe stunting and yellowing of plants. If weather patterns are favorable for germination and emergence of corn and not as favorable for development of corn seed and seedling diseases, there will be a substantial reduction in seed decay and seedling blight problems in corn. Corn planting has been behind normal because of the cold, wet weather. There were some windows for planting in April and a number of corn acres were planted in a short period of time just prior to the last period of almost state wide rain. There have been a few reports of fields in which corn has emerged or can be rowed but not as many as would normal for this time of year. In some fields corn emerged but growth since emergence has been quite slow. Certainly weather conditions over the next several weeks will be a key factor in which early season corn diseases develop and how serious these diseases are.

Seed decay and seedling blights of corn are generally caused by soil-inhabiting fungi such as species of *Pythium, Fusarium, Diplodia, Rhizoctonia* and *Penicillium*. These fungi may rot the seed prior to germination or cause preemergence or postemergence seedling blight. Affected seeds are usually discolored and soft and may be overgrown with fungi. Rotted seed may be difficult to find because they decompose very rapidly and because soil adheres fairly tightly to the decomposing seed.

With preemergence seedling blights, the seed germinates but the seedlings are killed before they emerge from the soil. The coleoptile and primary roots are usually discolored and have a wet, rotted appearance. With postemergence seedling blights, the seedlings emerge through the soil surface before developing symptoms. Seedlings tend to yellow, wilt and die. Discolored, sunken lesions are usually evident on the mesocotyl. Eventually the mesocotyl becomes soft and water soaked. The root system is usually poorly developed, and roots are discolored, water soaked and slough off. If the primary root system and mesocotyl are severely affected before the nodal or permanent root system has developed, the plants have little chance of surviving.

The *Pythium, Fusarium, Diplodia, Rhizoctonia* and *Penicillium* species which cause seed decay, seedling blight and crown decay are common in soils throughout the state. If conditions are favorable for germination and emergence, these fungi may not have the opportunity to invade seed, germinating seed or young seedlings so seed decay, seedling blights and crown rot will not be significant problems. On the other hand, conditions that are not favorable for germination and emergence, give these soil fungi more time to attack the seed and developing plants.

Numerous other factors also contribute to early season corn establishment problems. Insect damage, nutrient imbalances, herbicide injury, soil conditions and environmental factors, especially saturated soil conditions and oxygen deprivation, may also cause or contribute to early season corn establishment problems. Corn seedling blights are more severe in wet soils, in low lying areas in a field or in soils that have been compacted or remain wet for an extended period of time. Low soil temperatures (50-55°F) and wet soil conditions especially favor Pythium seed decay and seedling blight. Disease severity is also affected by planting depth, soil type, seed quality, mechanical injury to seed, soil crusting, herbicide injury or other factors which delay germination and emergence of corn.

Planting high quality seed into a good seedbed when soil temperatures are above 50F will help minimize these early season problems. Virtually all field corn seed comes with a fungicide seed treatment. Hopper box treatments can be used to supplement the existing seed treatment.

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ppp.missouri.edu/pestmonitoring/index.htm

Weather Data for the Week Ending May 5, 2009

By Pat Guinan

		Weekly Temperature (oF)						Monthly Precipitation (in.)		Growing Degree Days‡	
Station	County	Avg. Max.	Avg. Min.	Extreme High	Extreme Low	Mean	Departure from long term avg.	April 1 - April 26	Departure from long term avg.	Accumulated Since Apr. 1	Departure from long term avg.
Corning	Atchison	67	50	72	36	58	+1	4.19	+1.12	182	+61
St. Joseph	Buchanan	66	50	71	38	58	+1	4.30	+0.65	173	+31
Brunswick	Carroll	66	51	71	43	58	0	5.22	+1.97	196	+44
Albany	Gentry	66	49	73	37	58	+1	4.68	+1.14	155	+34
Auxvasse	Audrain	67	50	72	46	58	0	6.83	+3.12	201	+45
Vandalia	Audrain	67	50	73	45	58	0	6.54	+2.75	195	+56
Columbia-Jefferson Farm	Boone	67	51	73	46	59	0	7.35	+3.15	208	+24
Columbia-South Farms	Boone	67	51	72	46	58	-1	8.16	+3.96	208	+24
Williamsburg	Callaway	67	50	72	47	58	0	4.07	-0.40	201	+47
Novelty	Knox	66	49	72	44	57	0	4.78	+1.32	163	+23
Linneus	Linn	67	48	73	38	57	0	4.65	+1.30	174	+41
Monroe City	Monroe	67	50	73	46	58	0	7.12	+3.74	177	+20
Versailles	Morgan	68	52	75	46	59	0	4.53	+0.17	234	+13
Green Ridge	Pettis	67	51	71	45	58	0	6.13	+2.30	207	+47
Lamar	Barton	65	52	73	47	58	-2	3.55	-1.09	227	+5
Cook Station	Crawford	68	52	77	49	59	-1	5.40	+1.09	218	-14
Round Spring	Shannon	68	54	77	49	60	+1	4.69	+0.27	216	+10
Mountain Grove	Wright	65	52	74	47	58	-1	4.39	-0.41	193	+12
Delta	Cape Girardeau	70	57	79	51	63	+1	4.94	+0.74	255	-24
Cardwell	Dunklin	70	58	81	53	64	0	6.59	+1.80	327	-18
Clarkton	Dunklin	69	57	79	52	62	-1	5.67	+1.24	288	-45
Glennonville	Dunklin	69	57	79	52	63	-1	5.77	+1.51	300	-38
Charleston	Mississippi	69	57	81	52	63	+1	5.50	+0.93	277	0
Portageville-Delta Center	Pemiscot	70	58	81	53	63	-1	4.99	+0.29	327	-10
Portageville-Lee Farm	Pemiscot	70	58	81	53	64	+1	5.86	+1.13	331	+1
Steele	Pemiscot	71	59	82	54	64	0	5.13	+0.27	348	+11

* Complete data not available for report

‡Growing degree days are calculated by subtracting a 50 degree (Fahrenheit) base temperature from the average daily temperature. Thus, if the average temperature for the day is 75 degrees, then 25 growing degree days will have been accumulated.

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