

Integrated Pest & Crop Management

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 mid-April and early May 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 *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

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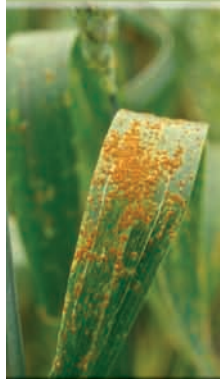
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Wheat Disease Update—May 27, 2008

By Laura Sweets

Virus diseases, especially barley yellow dwarf and wheat streak mosaic, remain the most common and widespread diseases of wheat in Missouri this season. A pink to red to purple discoloration of the flag leaf is the most obvious symptom of barley yellow dwarf right now. Plants with wheat streak mosaic may be showing a light green to yellow to almost white linear streaking on the flag leaf and leaves just below the flag leaf. For a more complete description of wheat virus diseases see the May 2, 2008 issue of the Integrated Pest & Crop Management Newsletter. At this point in the growing season there are no management options for virus diseases in wheat.

It is difficult at this time to predict how widespread and severe Fusarium head blight or scab will be in Missouri this year. Wheat heading is behind last year and behind normal. In the Bootheel heading is just about complete while in the northern third of the state it is just beginning. With the fluctuations in temperatures, wheat is moving through growth stages rather erratically this year. Many varieties were quite slow through flag leaf emergence and then jumped into head emergence and flowering. Atypical weather conditions this season are also complicating the situation. Temperatures have been cooler than normal until the Memorial Day Weekend. The holiday weekend also brought more rain, overcast conditions and higher humidity to much of the state. Wheat that is flowering or just past flowering during this period of frequent rains and high humidity may be at higher risk for scab or Fusarium head blight. The bleaching of glumes on part of the wheat head that is a typical symptom of Fusarium head blight should begin to show up over the next week or so. Fields that are at or past 50% flowering are past the stage of growth for legal fungicide applications.

Thus far this year foliage diseases of wheat such as Septoria glume blotch, leaf rust and powdery mildew have been difficult to find. Just in the last few days, symptoms of these foliage diseases are showing up on the lower leaves of susceptible varieties. The warmer, wetter weather could favor the increase in foliage diseases but so far flag leaves are remarkably free of foliage diseases. If wheat is past Feekes growth stage 10.5 (full head emergence) it is too late for fungicide application for foliar disease management.

During and just after flowering is the ideal time to pick out heads with loose smut in a field. The glumes on heads of infected plants are replaced with masses of black powdery spores and these black heads stand out among the healthy green heads in a field. Since loose smut is a seed-borne disease, seed from fields with loose smut should not be saved for planting.

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Some Early Planted Soybean Fields Sprayed For Bean Leaf Beetle Control

By Wayne Bailey

High numbers of bean leaf beetle adults have required insecticide applications to reduce numbers below economic threshold levels in some early planted soybean fields. Adult bean leaf beetles migrating from overwintering sites to early planted soybean fields have resulted in heavy leaf feeding and some plant mortality. In many areas wet weather has limited soybean planting and accumulated high numbers of beetles in seedling soybean fields that are available. The bean leaf beetle produces two generation annually in Missouri with larvae feeding on soybean roots. The economic threshold for bean leaf beetle adult feeding on seedling soybean is 5 or more beetles present per row foot or 1 or more plants destroyed per row foot. In most years control of beetles causing early season defoliation of soybean seedling is not needed. However the limited number of soybean available early season has forced high numbers of beetles into fields with seedling soybeans. Economic damage from bean leaf beetle is more common later in the season when beetles of the second generation feed on soybean pods.

<i>Recommended Insecticides for Bean Leaf Beetles in Soybean</i>		
<i>Chemical name</i>	<i>Common name</i>	<i>Rate of Formulated Material</i>
Esfenvalerate	*Asana XL	5.8 to 9.6 fl oz/acre
Beta-cyfluthrin	*Baythroid XL	1.0 to 1.6 fl oz/acre
Chlorpyrifos plus		
gamma-cyhalothrin	*Cobalt	19 to 38 fl oz/acre
Dimethoate	Dimethoate	see specific label
Chlorpyrifos 4E	*Lorsban 4E	1 to 2 pts/acre
	*numerous products	see specific labels
Thiodicarb	*Larvin 3.2 EC	see specific label
Zeta-cypermethrin	*Mustang Max	2.8 to 4.0 fl oz/acre
Encapsulated	*PennCap-M	2 to 3 pts/acre
Methyl Parathion		
Permethrin	*numerous products	see specific label
Gamma-cyhalothrin	*Proaxis	1.92 to 3.2 fl oz/acre
Acephate	Orthene	see specific label
Carbaryl	Sevin 4F	1 to 2 pts/acre
Carbaryl	Sevin XLR Plus	1 to 2 pts/acre
Lambda-cyhalothrin	*Warrior	1.92 to 3.2 fl oz/acre
Lambda-cyhalothrin	*Numerous products	see specific labels
<i>Read and follow all label direction, precautions, and restrictions.</i>		
<i>* Designated a restricted use product.</i>		

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Potato Leafhopper Numbers Increasing In Alfalfa Fields

By Wayne Bailey

Although alfalfa weevil larvae are still causing problems in Missouri, potato leafhopper adults have arrived and are increasing in numbers in alfalfa. Potato leafhoppers are about 1/8-inch in length, wedge shaped, and greenish-yellow in color. They are very mobile and quickly move sideways, jump, or fly when disturbed. This is a native insect which migrates into Missouri each spring from more southern states and Mexico. The potato leafhopper is often transported into the state by early spring storms which move in a northeast direction. The leafhoppers are thought to actively fly into the storms and be carried great distances by low level winds which approach 100 mph in speed. Leafhoppers are usually associated with strong thunderstorms containing hail. After a storm passes, high numbers of leafhoppers can often be found in the trail of the storms. In Missouri, the potato leafhopper adults generally arrive about 5 May of each year. However in 2008 they were first found about a week later on May 14 in central Missouri. The arriving adults may feed initially on several tree species before moving to alfalfa to feed and reproduce. Two to three generations of potato leafhopper are often produced with economic damage generally occurring

leafhopper in alfalfa depends on the height of the alfalfa and whether the alfalfa is a potato leafhopper resistant variety or a traditional alfalfa variety. Recently cut alfalfa is at highest risk from potato leafhoppers as alfalfa plants just recovering from harvest can only tolerate 1 leafhopper in 5 sweeps if a traditional, non-PLH resistant alfalfa variety is grown. If a PLH resistant variety of alfalfa is used, then the threshold increase by a multiple of 3, so the economic threshold level increase to 1 leafhopper in 15 sweeps for alfalfa less than 3-inches in height. Similarly, a traditional alfalfa variety 8-10 inches in height has a threshold of an average of one or more leafhoppers per sweep, whereas a PLH-resistant variety can withstand 3 potato leafhoppers before treatment is justified.

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Alfalfa Stem Length – in.	Ave # PLH/Sweep (traditional variety)	Ave # PLH/Sweep (PLH Resistant Variety)
<3	0.2	0.6
6	0.5	1.5
8-10	1.0	3.0
12-14	2.0	6.0

on alfalfa following removal of first harvest. Damage is caused when both adult and nymph (immature) leafhoppers use their piercing-sucking mouthparts to penetrate alfalfa leaflets and stems. They remove plant juices and often cause yellowing of established plants, stunted plant growth, and mortality of seedling alfalfa. Both forage quality and quantity are reduced by this alfalfa pest. Scouting for this alfalfa pest is best accomplished using a 15-inch diameter sweep net. Take 10 pendulum sweeps at five random locations in the field. If the average number of potato leafhopper adult and nymphs per sweep reach or exceed the threshold numbers listed below, treatment is justified. The economic threshold for potato

Chemical name	Common name	Rate of Formulated Material	Preharvest Interval
Beta-cyfluthrin	*Baythroid XL	0.8 to 1.6 fl oz/acre	7 days
Chlorpyrifos plus gamma cyhalothrin	*Cobalt	7 to 13 fl oz/acre	7-14 days
Dimethoate	Dimethoate	see specific label	10 days
Carbofuran	*Furadan 4F	1 to 2 pts/acre	14 - 28 days
Chlorpyrifos 4E	*Lorsban 4E *numerous products	1 to 2 pts/acre see specific labels	7 - 14 days 7 - 14 days
Malathion	numerous products	see specific labels	0 - 7 days
Methyl Parathion	*numerous products	see specific lables	15 days
Zeta-cypermethrin	*Mustang Max	2.24 to 4.0 fl oz/acre	3 days
Permethrin	*numerous products	see specific label	7 - 14 days
Gamma-cyhalothrin	*Proaxis	1.92 to 3.2 fl oz/acre	1 day forage 7 day hay
Carbaryl	Sevin 4F	1 qt/acre	7 days
Carbaryl	Sevin XLR Plus	1 qt/acre	7 days
Lambda-cyhalothrin	*Warrior	1.92 to 3.2 fl oz/acre	1 day forage 7 day hay
Lambda-cyhalothrin	*Numerous products	see specic labels	1 day forage 7 days hay

*Read and follow all label direction, precautions, and restrictions. * Designated a restricted use product.*

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soil temperatures (50-55 degrees Fahrenheit) 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 50 degrees 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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Weather Data for the Week Ending May 26, 2008

By Pat Guinan

Station	County	Weekly Temperature (oF)						Monthly Precipitation (in.)		Growing Degree Days‡	
		Avg. Max.	Avg. Min.	Extreme High	Extreme Low	Mean	Departure from long term avg.	May 1-26-May	Departure from long term avg.	Accumulated Since Apr. 1	Departure from long term avg.
Corning	Atchison	76	56	91	45	66	2	4.16	0.39	432	29
St. Joseph	Buchanan	75	56	87	47	65	0	3.56	-0.63	401	-39
Brunswick	Chariton	74	56	88	46	65	0	3.68	-0.73	437	-13
Albany	Gentry	74	53	88	41	64	0	3.32	-0.5	376	-30
Auxvasse	Audrain	73	55	86	46	63	-2	4.56	0.18	419	-32
Columbia	Boone	73	55	87	45	64	-2	6.16	1.8	439	-58
Sanborn Field	Boone	74	57	88	49	65	-1	5.27	0.85	481	-38
Williamsburg	Callaway	74	55	85	45	63	-2	5.26	0.83	422	-21
Novelty	Knox	70	52	82	42	61	-3	3.66	-0.54	354	-70
Linneus	Linn	73	54	88	43	63	-1	3.53	-0.87	384	-22
Monroe City	Monroe	71	53	80	43	61	-3	2.42	-1.78	380	-73
Versailles	Morgan	76	58	89	51	67	1	6.94	2.33	487	-59
Green Ridge	Pettis	76	57	88	49	66	1	4.64	0.1	447	18
Lamar	Barton	79	60	86	48	70	3	8.02	3.12	504	-59
Cook Station	Crawford	80	54	88	42	67	1	4.6	0.29	483	-83
Alley Spring	Shannon	82	53	88	41	68	2	3.52	-1.16	480	-38
Round Spring	Shannon	81	54	88	41	68	2	4.44	-0.16	480	-40
Mountain Grove	Wright	78	57	85	43	68	2	4.9	0.38	447	-42
Delta	Cape Girardeau	80	57	88	47	69	0	5.02	0.62	543	-124
Cardwell	Dunklin	86	62	92	54	74	2	2.26	-2.01	697	-81
Clarkton	Dunklin	85	60	93	51	73	2	2.06	-1.54	638	-115
Glennonville	Dunklin	84	61	90	49	72	1	2.13	-1.37	651	-103
Charleston	Mississippi	82	59	89	49	70	1	4.06	0	602	-53
Portageville-Delta Center	Pemiscot	84	62	90	52	73	2	3.06	-0.69	689	-69
Portageville-Lee Farm	Pemiscot	84	62	91	52	73	2	2.49	-1.35	689	-59
Steele	Pemiscot	87	63	94	51	75	4	1.63	-2.74	731	-32

* 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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