Plant Protection Programs University of Missouri

Integrated Pest & Crop Management

Wheat Disease Update for May 18, 2009

By Laura Sweets

Much of the wheat in the state has moved into the flowering stages of growth. And, if this week is indeed warm and dry as forecast, wheat may move through the flowering stages fairly quickly. Infections of both Fusarium head blight and loose smut occur as the crop is flowering and both are favored by wet conditions during flowering. As of last week there were some fields in southeast Missouri showing symptoms of Fusarium head blight or scab and one report from central Missouri of a field showing symptoms of loose smut but in most fields it was still too early to see typical symptoms. Those symptoms may be more evident this week.

The characteristic symptom of Fusarium head blight or scab on wheat is a premature bleaching of a portion of the head or the entire head. Superficial mold growth, usually pink or orange in color, may be evident at the base of the diseased spikelets. Bleached spikelets are usually sterile or contain shriveled or discolored seed.

Loose smut may be obvious as the head emerges from the boot. All portions of the head except the rachis are converted to masses of dusty black spores. These spores are eventually dislodged by wind and rain, so later in the season the smutted stems are less evident.

At this point in the season, i.e. most of the crop well into flowering, there is little that can be done to manage either Fusarium head blight or loose smut. The pathogens which cause both of these diseases can be seed-borne so saving seed from fields with high levels of Fusarium head blight or loose smut is not recommended.

There have been a few more reports of virus diseases in wheat, especially barley yellow dwarf on the flag leaves. Overall, both virus diseases and fungal foliage diseases are not as widespread or severe as last season.

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How To Kill Your Corn

By Kevin Bradley

I have received a lot of calls lately about options for killing out poor stands of corn and planting a new stand of corn back into these areas. Most of these calls have to do with Roundup Ready corn and how to eliminate it and plant back into these fields. I don't have a lot of data on this topic, but we did conduct a few experiments in 2006 and 2007 to investigate several options and I have provided those results below in Tables 1 and 2.

First, one of the most obvious options for eliminating any type of corn is tillage. Many growers are not willing to resort to this, but this is a viable option and the costs of a tillage operation should be weighed against the cost of the available herbicide options before this possibility is ruled out.

Second, the type of herbicide resistance technology offered in the corn that was planted will be CRITICAL in determining which herbicide can be used for this purpose. If the corn was not a Roundup Ready variety, then any of the generic or brand name glyphosate products will provide good control. If the previously-planted corn was a Roundup Ready variety, then eliminating the corn stand will be more difficult. Obviously the problem is that there are few herbicides that provide consistent control of Roundup Ready corn and at the same time allow for corn replanting in a short period of time after application.

Towards the end of 2008, Select Max (clethodim) received a supplemental label for the control of poor stands of corn. This label allows for the application of Select Max at 6 fluid ounces per acre for the control of Roundup Ready corn and for replanting of the subsequent corn crop into these areas six days after application. Although we have not evaluated this exact rate, in our research with Select Max we have observed excellent control of small (V1-V2) corn stands with this product (Table 1). As the results in Table 1 indicate, taller and more mature (V4-V5) corn stands will be harder to control with the 6 or even 8 fluid ounce rate of Select Max.

Although Select Max is probably the cheapest option for eliminating poor stands of Roundup Ready corn, some growers are just not willing to wait six days before replanting corn back into their fields. Another option that allows for immediate corn replanting is Gramoxone plus Sencor or Gramoxone plus Linex (Tables 1 and 2). As shown in the tables below, these combinations can provide very good control of corn as well.

Tables 1 and 2 also show the inconsistency in corn control with a single application of either Liberty or Gramoxone. This is due to the contact nature of both of these herbicides and the likelihood that the growing point remained below ground at the time of these applications. Although Liberty or Ignite (the new formulation of Liberty) is certainly a better option than Gramoxone as long as the initial corn isn't a LibertyLink hybrid or hybrid stacked with LibertyLink, I still would not recommend applications of Ignite alone for this purpose. I believe you will obtain much more consistent control by combining Ignite with Linex or Sencor.

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Table 1. Influence of Select Max and comparison herbicide treatments on corn control at two application timings (Columbia, MO - 2007)

Treatments	*Rate*	*V1-V2 Corn at Application*	*V4-V5 Corn at Application*
		——————% Control*——————	
Select Max	4 fl ozs/A	100	59
Select Max Degree Xtra	6 fl ozs/A 2 qts/A	94	66
Select Max	8 fl ozs/A	100	71
Gramoxone Inteon Sencor	2 pts/A 2 ozs/A	100	75
Liberty	34 fl ozs/A	100	88

*** Indicates control of the initial corn stand 60 days after planting.**

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Table 2. Influence of Gramoxone combinations on corn control at two application timings (Columbia, MO - 2006)

Treatments	Rate	1-3 Inch Corn at Application	4-6 Inch Corn at Application
		——————% Control*——————	
Gramoxone Max	1.5 pts/A	35	16
Gramoxone Max Sencor	1.5 pts/A 3 ozs/A	99	100
Gramoxone Max Linex	1.5 pts/A 1 pt/A	99	100
Liberty	32 fl ozs/A	2	90

*** Indicates control of the initial corn stand 50 days after planting.**

MU Extension Will Scout Missouri Soybean Fields for Rust in 2009

By Allen Wrather

University of Missouri Extension staff will scout select Missouri soybean fields for rust in 2009. Each of these select fields, sentinel fields, will be scouted weekly from mid August to mid October. The objective is to detect soybean rust when it first starts to develop in Missouri soybean fields so farmers can be warned about the presence of rust. Once the disease is detected, an all-out alert will be issued to farmers in the area of detection using radio and other media. Contact Allen Wrather, wratherj@missouri.edu, for more information about this. Individuals interested in more information about rust can go to www.sbrusa.net to view a map of the U. S. showing areas scouted for rust and areas were rust has developed.

Missouri farmers and crop consultants may have soybean leaves examined for rust at the University of Missouri Plant Diagnostic Clinic. Soybean leaves and a moist paper towel should be sealed in a plastic bag, and these should be sent immediately by express mail to the clinic along with a completed information form. The information form and more instructions about collecting and mailing samples to the clinic are posted at http://soilplantlab.missouri.edu/plant/index.htm. You may also call, 573-882-0623, or email the clinic, plantclinic@missouri.edu, about this and other services they provide. The clinic can also provide diagnosis and management information for other soybean problems including diseases, insects, and weeds. There is a $15 fee for examination of samples submitted to the diagnostic clinic.

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Replant Options Following Preemergence Corn Herbicides

By Kevin Bradley

Some of the corn acreage in Missouri has suffered from heavy rains or flooding, and in some of these fields preemergence corn herbicides had already been applied. Yet again this year, questions have arisen about the replant restrictions of preemergence corn herbicides, as some producers now wish to plant soybeans into fields that already had corn and preemergence corn herbicides applied. Table 1 provides a list of some of our most common preemergence corn herbicides and the replant restrictions of these herbicides for corn, grain sorghum, and soybeans. As you can see from this table, soybeans **SHOULD NOT** be planted into fields where applications of atrazine or an atrazine premix have already been made this season. The label clearly states that soybeans should not be planted until the following year due to the likelihood of soybean injury from residues of atrazine that may still be present in the soil. The average field half-life of atrazine will vary dramatically depending on the soil and environmental conditions experienced, but the *Herbicide Handbook* published by the Weed Science Society of America lists the average field half-life of atrazine as 60 days. High soil pH's (>7.5) will also slow the degradation of atrazine, along with cool soil conditions. Fortunately, replanting corn or planting grain sorghum into these damaged areas will still be an option where atrazine or most of these atrazine premixes have been applied.

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Table 1. Replanting restrictions for some common preemergence corn herbicides

	Interval Between Application and Planting		
	Rate	***V1-V2 Corn at Application***	***V4-V5 Corn at Application***
	Months		
Atrazine	**0**	0	NY[a]
Balance Pro	**0**	6	6
Balance FLexx	**0**	6	6
Basis	**0**	10	0.5-10[d]
Bicep II Magnum	**0**	0[b]	NY[a]
Callisto	**0**	10	10
Camix	**0**	NY[a]	NY[a]
Cinch	**0**	0[b]	0
Cinch ATZ	**0**	0[b]	NY[a]
Define	**0**	12	0
Degree	**0**	NY[a]	NY[a]
Degree Xtra	**0**	NY[a]	NY[a]
Dual II Magnum	**0**	0[b]	0
Epic	**0**	12	6
Expert	**0**	0[b]	NY[a]
Frontier	**0**	0[b]	0
Guardsman Max	**0**	0[b]	NY[a]
Harness	**0**	NY[a]	NY[a]
Harness Xtra	**0**	NY[a]	NY[a]
Hornet	**0**	12	10.5
Keystone	**0**	NY[a]	NY[a]
Lexar	**0**	NY[a]	NY[a]

*** Indicates control of the initial corn stand 60 days after planting.**

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Linex/Lorox	0[c]	0[c]	0[c]
Lumax	0	NY[a]	NY[a]
Marksman	0	0	NY[a]
Outlook	0	0[b]	0
Princep	0	NY[a]	NY[a]
Python	0	12	0
Radius	0	12	6
Require Q	0	10	10
Resolve/Resolve Q	0	10	10
SureStart	0	NY[a]	NY[a]

[a]NY=next year.
[b]Replant interval only applies if safener-treated seed is used.
[c]Thoroughly rework soil before replanting.
dIff 1/3 oz. Basis applied, rotation interval is 15 days. If >1/3 oz. Basis applied, rotation interval is 10 months.

Alfalfa Weevil Larvae Infected with Fungal Pathogen

By Wayne Bailey

A fungal pathogen has appeared in most alfalfa weevil populations in central and northern Missouri. The pathogen was found about a week ago in larvae in central Missouri and can now be found in most fields statewide. The fungus, Zoophthora spp., is present in fields each year, but is dependent on the occurrence of wet, warm conditions to be an effective biological control agent of alfalfa weevil larvae. Ben Puttler, retired entomologist from the Biological Control Laboratory in Columbia, monitors for the presence of this fungus in alfalfa weevil larvae annually by collecting larvae and determining the presence of the fungus under laboratory conditions. He did find the fungus in field collected larvae about 10-14 days ago at which time he predicted the collapse of alfalfa weevil populations statewide. When scouting for alfalfa weevil larvae in the field, the first indication that the fungus is present in the weevil population is a change in color of the larvae from their normal lime green color to more of a yellow color. Once yellow larvae are observed, the alfalfa weevil larval population will collapse within a few days to about 10 days later depending on weather conditions. In the past, several researchers have attempted to develop commercial formulations of the fungus for use on alfalfa weevil larval infestations, but with little success. Because the fungus is almost always present in alfalfa fields, the application of additional fungal spores in alfalfa fields is of little value. Weather is the controlling factor which determines whether this fungus is expressed in and kills alfalfa weevil larvae each year. Our wet and recent warm conditions have resulted in effective control of the moderate numbers of weevils found in northern and central Missouri fields this spring. However, in most years the fungus appears too late for early control of alfalfa weevil populations in southern counties of Missouri.

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Visit our Web site at ppp.missouri.edu

Potential for Black Cutworm Problems Still Exist

By Wayne Bailey

Problems with black cutworm continue to be reported, although numbers of infestations statewide are lower than in past years. Although limited numbers of black cutworms may overwinter in Missouri in some years, a majority of infestations originate from moths migrating into the state on the front side of early spring storms which originated from sites along the Gulf Coast and Mexico. Female moths will lay up to a 1,000 eggs either singularly or in masses of up to 30 eggs on a variety of vegetations and occasionally on plant residues. Larvae vary from light gray to black in color and grow to 1 ½ - 2 inches in length. A total of 6 to 7 worm stages or instars are produced with instars 1-3 feeding on leaf tissue and instars 4 -7 cutting plant stems as well as feeding on foliage. When disturbed, the larvae will curl into a "C" shape and play dead until the danger has passed. This insect produces 3 generations annually with 35 – 50 days required to complete a generation (egg to adult). The black cutworm is a general feeder with the first generation often attacking the field crops of corn, sorghum, and occasionally wheat. Later generations are often responsible for problems in turf and vegetables.

Late planted corn is most at risk from black cutworm larval attack. Small seedlings are most heavily damaged by large worms. As larvae have grown in size during the past few weeks, small recently emerged corn seedlings will sustain severe damage if a black cutworm infestation is presen. Damage is often restricted to low areas of the field which contained lush vegetation during the time eggs were being deposited, although some fields will have larval infestations throughout. Producers are encouraged to scout fields several times per week to determine the presence and level of black cutworm infestations. As corn plants reach the 4-leaf stage they are less likely to be attacked by this pest. Economic thresholds for black cutworm infestations vary by field, plant size, and insect size and number, but generally treatment is recommended if 1-2% or more of plants are cut below ground and 2-3% or more of plants are cut above ground. Above ground cutting is less serious as the growing plant is left undamaged, in contrast to being damaged when plants are cut underground. Seed treatments will provide some control, but may not prevent an infestation from reaching or exceeding economic threshold levels. The risk from black cutworm larval damage to seedling corn will continue for about another two weeks. The following list of insecticides is recommended for black cutworm larval control on field corn.

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Table 1. Black Cutworm

Black Cutworm			
Comments: Apply as postemergent 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	***Hero**	2.6 to 6.1 fl oz.	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** ***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
gamma-cyhalothrin	***Proaxis**	1.92 to 3.2 fl. oz.	Broadcast
lambda-cyhalothrin	***Warrior**	1.92 to 3.2 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.

True Armyworm Numbers Drop in Wheat and Fescue

By Wayne Bailey

Although wheat fields and some fescue fields required insecticide applications for true armyworm larval infestations, numbers of larvae have dropped as beneficial insects and pathogens take their tolls. The potential for true armyworm infestations still exists in some areas of the state. However, most larval infestations have been limited by natural pathogens. Producers should continue to monitor wheat and fescue fields and grass pastures for 2-3 more weeks, or until larvae have pupated and moths for the second generation appear. Typically, only first generation true armyworm larvae attacks fescue, grass and wheat fields with generations 2-3 moving to turf, vegetable and ornamental crops to feed.

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Weather Data for the Week Ending May 18, 2009

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 - May 18	Departure from long term avg.	Accumulated Since Apr. 1	Departure from long term avg.
Corning	Atchison	71	50	80	40	61	-2	1.50	-1.07	349	+54
St. Joseph	Buchanan	70	50	81	44	60	-3	2.36	-0.58	329	+10
Brunswick	Carroll	73	52	84	41	62	-1	3.13	+0.13	366	+33
Albany	Gentry	69	48	78	38	59	-4	3.58	+0.83	293	+2
Auxvasse	Audrain	73	52	83	42	62	-1	2.40	-0.86	374	+36
Vandalia	Audrain	73	50	83	39	62	-1	2.48	-0.54	362	+49
Columbia-Jefferson Farm	Boone	73	50	81	37	62	-2	3.21	-0.04	378	+8
Columbia-South Farms	Boone	73	50	81	37	62	-2	3.76	+0.51	378	+8
Williamsburg	Callaway	73	49	82	38	62	-1	2.36	-0.90	367	+41
Novelty	Knox	68	48	77	39	59	-4	5.30	+2.35	299	-13
Linneus	Linn	*	*	*	*	*	*	*	*	*	*
Monroe City	Monroe	71	50	79	40	60	-3	2.58	-0.33	334	-5
Versailles	Morgan	74	50	84	38	63	-1	2.78	-0.84	417	+3
Green Ridge	Pettis	73	52	84	40	63	0	2.67	-0.44	380	+38
Lamar	Barton	73	53	84	43	64	-1	5.23	+1.61	405	-17
Cook Station	Crawford	75	48	84	35	63	-2	4.89	+1.67	383	-50
Round Spring	Shannon	77	49	85	37	63	-1	4.11	+0.77	391	-1
Mountain Grove	Wright	72	50	81	40	62	-2	5.10	+1.82	354	-6
Delta	Cape Girardeau	75	54	85	45	66	-1	2.65	-0.78	470	-39
Cardwell	Dunklin	76	57	85	49	68	-1	4.25	+1.18	562	-40
Clarkton	Dunklin	77	56	86	46	67	-1	3.40	+0.95	515	-67
Glennonville	Dunklin	77	57	86	47	67	-1	4.89	+2.48	533	-53
Charleston	Mississippi	76	57	84	48	67	0	5.18	+2.40	506	+6
Portageville-Delta Center	Pemiscot	77	58	86	48	68	-1	4.23	+1.42	565	-24
Portageville-Lee Farm	Pemiscot	*	*	*	*	*	*	*	*	*	*
Steele	Pemiscot	77	58	86	48	68	-1	6.33	+3.25	591	-3

* 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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