

Integrated Pest & Crop Management

Evaluate Winter Wheat Seed Quality Prior to Planting

By *Laura Sweets*

Fusarium head blight or scab was widespread, and in some fields severe, this season. The fungus which causes this disease may infect kernels and can affect stands if infected seed is planted. Bacterial streak (leaf symptom) and black chaff (head symptom) were also a problem in scattered fields throughout the state. The bacterium which causes this disease is seedborne. If wheat is going to be saved for seed, this is certainly a year to pay careful attention to the quality of seed being saved.

Bacterial streak and black chaff are names for the same bacterial disease which produces symptoms on both leaves and heads. Water-soaked lesions may develop on young leaves. These develop into reddish brown to brownish black streaks on the leaves. Glumes and awns brown-black blotches or streaks. Black chaff may be confused with glume blotch. Symptoms may not be evident on individual kernels but the bacterial pathogen can be seedborne. Since seed treatment fungicides are not effective against this bacterial pathogen, seed from fields which had bacterial streak and black chaff should not be used for planting.

Fusarium head blight or scab infection may result in shriveled and shrunken kernels, lightweight bleached or tombstone kernels or kernels that have a pinkish cast or discoloration. Lots with high levels of scab may have lower germination rates. The fungus that causes scab can also cause a seedling blight of wheat. If scab infected seed is used for planting, seedling blights and stand establishment problems may occur. Management of Fusarium seedling blight is through the planting of disease-free seed or a combination of thoroughly cleaning the seed lot, having a germination test run, adjusting the seeding rate to compensate for germination rate and using a fungicide seed treatment effective against seedborne Fusarium or scab (see accompanying table of wheat seed treatment fungicides).

Because scab can decrease germination, a germination test may be especially useful in

determining if a particular lot should be used for seed. The minimum germination rate for certified seed is 85% germination. It is possible that lower germination rates might be successfully used for seed if the seeding rate is adjusted to compensate for the low germination rate. But this can be risky, especially if weather conditions at and after planting are not favorable for germination and emergence. Fungicide seed treatments can provide some benefit but they cannot resurrect dead seed.

If seed from a field that had Fusarium head blight or scab is being considered for use as seed this fall, it is important to get an accurate germination test and use this information in deciding whether or not to use the lot for seed, whether the seeding rate will need to be increased and whether or not to apply a seed treatment fungicide.

Before submitting a sample for a germination test it is important to thoroughly clean the seed.

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The wheat seed should be cleaned to remove small and damaged seed and to eliminate weed seeds. With the amount of scab some lots this year, thoroughly cleaning a lot may clean out 25-30% of the seed in the lot. But a thorough cleaning will give more reliable germination test results and removing small and damaged seed will not only aid in crop establishment it will also provide a more uniform wheat seedling stand. Removing small and damaged seed will also increase the thousand-kernel weight (TKW), which serves as a measure of seed quality. Wheat seed lots with TKW values greater than 30 grams tend to have increased fall tiller number and seedling vigor.

The next step is to perform a germination test. Germination tests can either be completed at home or by sending a sample to the Missouri Seed Improvement Association or the Missouri Department of Agriculture.

A home test can be performed by counting out 100 seeds and placing them in a damp paper towel. Place the paper towel into a plastic bag to conserve moisture and store in a warm location out of direct sunlight. After five days, count the number of germinated seeds that have both an intact root and shoot. This will give the grower an estimate of % germination. It is important to choose random seeds throughout the entire seed lot and conduct at least five 100 seed counts.

The Missouri Seed Improvement Association performs germination tests. The test requires one pound of seed and costs \$13.75. For details email MOSEED@AOL.com or check the Missouri Seed Improvement Association web site at <http://www.moseed.org/> (see lab services then fees and forms for details on submitting samples).

The State Seed Control Laboratory at the Missouri Department of Agriculture also performs germination

tests. The test requires one pint to one quart of seed. From June 1 through August 31 tests are free but between September 1 and November 1 there is a \$12.00 fee per sample and a limit of four samples per farmer. Information and a submission form can be obtained on the Missouri Department of Agriculture web site, <http://mda.mo.gov/plants/seed/> and then clicking on Submitting Seed Service Samples.

If germination is below 85% it is important to increase the seeding rate to compensate; however seeding any wheat with a germination test below 80% would not be recommended.

The next step is to decide whether a fungicide seed treatment is necessary. A number of fungicides are labeled for use as seed treatment fungicides on winter wheat. These seed treatment fungicides protect germinating seed and young seedlings from seedborne and soilborne pathogens. Seed treatment fungicides will not improve germination of seed that has been injured by environmental factors and will not resurrect dead seed. A correct assessment of the cause of poor seed quality or poor germination rates is the first step in deciding if a seed treatment fungicide is necessary.

Fungicide seed treatments for winter wheat are included in the 2011 Pest Management Guide: Corn, Grain Sorghum, Soybean and Winter Wheat, Extension Publication M171. Printed copies of this bulletin are available from the Extension Publications Distribution Center, 2800 Maguire Blvd., Columbia, MO, 573-882-7216.

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MU IPM Pest Monitoring Network

Taking an Environmentally Sensitive Approach to Pest Management



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“Big” Weeds in Soybean. What Can You Do?

By Kevin Bradley

Each year, from about the beginning of July through the middle of August, there isn't a lot of variety to the calls I get related to weed management in soybeans. The questions usually have to do with essentially one issue, “How do I control big weeds in soybean?” Obviously “big” is a relative term but my definition is usually way different from everyone else's. This is primarily due to the fact that if you have weeds over 6-inches or so in height, it is highly likely that you are already losing soybean yield. But that is a topic for another time. Most of the calls I get don't have to do with 6-inch weeds; more commonly the questions have to do with weeds double or even triple that height. Either these weeds never got sprayed because of the wet season we've had, or the weeds have already been sprayed one or more times with glyphosate (sold as Roundup, Touchdown, or a variety of other trade names) and they are still living. In recent years, the vast majority of the questions have to do with this latter scenario. I believe we have now moved into an era where glyphosate-resistant weeds like waterhemp, palmer pigweed, marestail, and giant ragweed have taken over as the predominant weed problems in Missouri soybean production fields. Based on all of the research I have conducted or seen over the years on both resistant and non-resistant weed populations, I have to divide my answer to the question of controlling “big” weeds in Roundup Ready soybean into the following two categories:

1.) If you don't think you have glyphosate-resistant weeds present.

If you have a field where the weeds (including waterhemp) have gotten tall and you DON'T suspect you have any glyphosate-resistant weeds present, then our research shows that increasing the rate of glyphosate will generally provide as good or better weed control than adding a tank-mix partner to glyphosate in Roundup Ready soybeans. There may be some exceptions to this statement if you are dealing with weeds that have some natural tolerance to glyphosate. For example, a tank-mix of flumiclorac (Resource) can sometimes provide better morningglory control than even a higher-than-normal rate of glyphosate. Also, there are some weeds like Asiatic dayflower and field horsetail that we are probably never going to kill with glyphosate and a tank-mix can often help with these kinds of weed species. For the most part, however, our research has shown that if there are no resistant weeds present, our “normal” spectrum of weeds in Missouri will usually be controlled as good or better by

a higher rate of glyphosate when compared to a standard application rate of glyphosate plus some other tank-mix partner. Another way of saying it is that if you fall into this category (no glyphosate-resistant weeds), it is often better for you to take the money you were going to spend on the tank-mix partner and put that money towards a higher rate of glyphosate per acre.

2.) If you suspect you have a glyphosate-resistant weed present.

The other side of the coin is that if you suspect you have a glyphosate-resistant weed like waterhemp, palmer pigweed, marestail, or giant ragweed present, then a tank-mix partner is almost a requirement and is essentially our last line of defense for the control of these species. As I mentioned previously, unfortunately I'm afraid that a large percentage of the soybean acreage in Missouri now falls into this second category. In these fields, increasing the rate of glyphosate when you have glyphosate-resistant weeds present will rarely provide better weed control and will obviously just cost you more money.

Based on all of the research I have seen or conducted on glyphosate-resistant waterhemp and palmer pigweed, we have found that the addition of acifluorfen (Ultra Blazer), fomesafen (Flexstar, Dawn, etc.), or lactofen (Cobra, Phoenix) to a standard rate of glyphosate provides similar and significantly better control of glyphosate-resistant waterhemp than applications of glyphosate alone (at any labeled rate). However, the larger the waterhemp is in size, the less effective these tank-mix partners will be. So, if you have a field that falls into this category, make sure you apply the tank-mix combination as soon as you can. Obviously there are several other products on the marketplace that are promoted as tank-mix partners with glyphosate that I have not mentioned. Some of these include carfentrazone (Aim), 2, 4-DB (Butyrac), fluthiacet (Cadet), flumiclorac (Resource), and cloransulam (FirstRate). In our research, we have found tank-mix applications of these products to be ineffective on glyphosate-resistant waterhemp.

In our research with glyphosate-resistant giant ragweed, we have found that fomesafen (Flexstar, Dawn, etc.) may provide slightly better control than lactofen (Cobra, Phoenix), but like waterhemp the larger the giant ragweed is in size, the less effective the tank-mix partner will be. In most cases, cloransulam (FirstRate) will also provide good control of glyphosate-resistant giant ragweed, assuming it is not too tall, and assuming your giant ragweed is not ALS-resistant.

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There are few options for controlling tall weeds like waterhemp in soybeans, especially if you suspect them to be resistant to glyphosate.

Finally, as far as glyphosate tank-mix partners are concerned I think one of the biggest things you need to avoid is the temptation to use a tank-mix partner just because it only adds another couple of dollars per acre to the total application cost. Also, we should be aware of the potential for antagonism of some of these products with glyphosate. Just because a product appears to control weeds quicker, that doesn't always mean that the product or tank-mix treatment is better.

As I have mentioned in many previous articles and talks on this subject, a tank-mix partner that is included with your glyphosate application is not the way to solve your glyphosate-resistant weed problem; it is simply our last line of defense during the season. If you have weeds that you know or suspect are glyphosate-resistant and you plan

to continue with Roundup Ready soybeans in the future, I would strongly urge you to use a pre-emergence, residual herbicide next year that is effective on your problem weed in question. This will do much to reduce the population of your problem weed over time. An in-crop, post-emergence tank-mix treatment may still be needed, but the number of weeds that ever get treated with this tank-mix will be dramatically less and much more manageable.



Once weeds like giant ragweed reach this height in soybean, glyphosate tank-mix partners provide little control.

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May Begin to See “Wilting Soybeans”

By Laura Sweets

With the extremely hot temperatures and relatively dry conditions that are forecast for much of the state over the next 7 to 14 days, there may be calls and questions about wilting soybean plants. With the extended period of wet conditions early in the season, many plants may have shallow root systems. These plants may be more prone to wilting under hot, dry conditions. The early wet conditions may also have been favorable for the development of root rot diseases such as Phytophthora root rot, Rhizoctonia root rot and Fusarium root rot. These root rot diseases may have weakened root systems, damaging roots and stem tissue. Again, these diseased plants would be more prone to wilting and even premature death if stressed by hot, dry conditions.

In the field it may be possible to distinguish between Phytophthora root rot, Fusarium root and tap rot and Rhizoctonia root rot if plants are carefully dug up and the soil gently removed from the root system. These diseases may occur alone but can also occur in combination which makes field diagnosis more difficult. At this point in the season there are no management options for these root rot diseases. Foliar fungicides will not control Phytophthora root rot, Fusarium root rot or Rhizoctonia root rot. Moderate and consistent weather conditions might help alleviate the stress on plants and keep some plants from dying but continued high temperatures or fluctuations in weather conditions may lead to more wilting and death of

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plants.

Phytophthora can cause seed rot, preemergence damping-off and early postemergence damping-off as well as late-season Phytophthora. Phytophthora seedling blight causes established seedlings to turn yellow, wilt and die. Generally the entire seedling is affected and roots may be poorly developed and rotted. As plants begin to flower and set pods, symptoms of late-season Phytophthora root and stem rot may develop. Infected older plants may show reduced vigor through the growing season, die gradually over the season or, as this year, die quite rapidly. Lower leaves may show a yellowing between the veins and along the margins. Upper leaves may yellow. Or the entire plant may have a yellow, off-color cast. The stems typically show a characteristic brown discoloration that extends from below the soil line upward. Eventually the brown discoloration may extend out several inches on the lower side branches of the plant. Entire plants may wilt and die. Withered leaves tend to remain attached even after the plant dies. Phytophthora root rot is more likely to occur in heavy, wet soils, low areas or compacted areas, but it may occur in light soils or better drained areas if heavy rains occur.

Rhizoctonia can cause seedling blight and root rot of soybean. Affected stands may have an uneven appearance and seedlings appear pale green in color and stunted in growth. The identifying feature of this disease is a small, reddish lesion on one side of the stem at or just below the soil line. This lesion develops into a sunken, cankered area at the point of infection. Sometimes the lesion will expand to completely girdle the stem. On severely infected seedlings, the entire hypocotyl may be discolored and shriveled into a dry, stringy or wiry stem. *Rhizoctonia* can also cause a root rot of older plants. On older plants the lower leaves may begin to yellow. The yellowing may be from the margin in resembling symptoms of potassium deficiency or may be a more general yellowing. Plants may be stunted and appear less vigorous than adjacent plants.

When plants are removed from the soil, the root system may be poorly developed, lateral roots may be discolored or rotted and the stem may have a brick red discoloration beginning at the soil line and extending in either direction from the soil line. If plants are stressed by hot, dry conditions, severely infected plants may die. If cool, wet conditions occur after plants are infected with *Rhizoctonia* root rot, a flush of secondary roots may develop above the diseased portion of the stem. These plants may survive but are likely to remain stunted for the rest of the season.

Fusarium can also cause root rot of soybean. Infection is usually confined to roots and lower stems. The lower part of the taproot and the lateral root system may be discolored, deteriorated or completely destroyed. Older plants may be stunted, have an off-color or yellow cast and appear less vigorous than adjacent plants. When plants are removed from the soil, the taproot will show varying degrees of discoloration and deterioration. Discoloration may range from brown to purple-brown to almost black. The taproot and lower stem may show distinct lesions or may be rotted completely through. If the taproot is rotted through, it may break if the plant is pulled from the ground. If plants are stressed by hot, dry conditions, severely infected plants may die.

Once the crop has been planted, there is little that can be done to reduce incidence or severity of soybean root rot diseases. Additional stress from poor growing conditions, herbicide injury or other factors may compound problems with soybean root rot diseases. Prior to planting it is important to consider variety selection (especially in fields with a history of Phytophthora), fungicide seed treatment, crop rotation, seedbed preparation and conditions at planting.

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Small Grasshoppers Numerous in Many Areas of Missouri

By *Wayne Bailey*

Several regions of Missouri are experiencing high numbers of small grasshoppers. Historically wet years have not favored grasshopper populations, as high moisture levels tend to allow bacterial and fungal pathogens to attack developing grasshopper nymphs. This has changed in the past 5 years as grasshopper populations tend to build whether wet conditions are present or not. The economic thresholds for grasshoppers vary depending on the commodity or non-cropland area requiring insecticide applications for effective grasshopper management. In Missouri, there are approximately 100 species of grasshoppers although only 5-7 species are common in field

crops. Although there are conflicting data, most entomologist believe that smaller grasshoppers (small nymphs) are more easily controlled with insecticides than larger nymphs or adult hoppers. As with most insects, the larger the hoppers grow, the more foliage and other plant materials they consume. Damage from both nymph and adult grasshoppers is often seen as very ragged feeding wounds located on leaf edges. In severe situations, high numbers of grasshoppers can consume large amounts of vegetation and cause substantial loss of grain and forage yields. Economic threshold information is listed with each of the following commodity tables.

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SITE: Alfalfa - Grasshoppers 2011

- *Comments: Control grasshoppers when they are small by applying spot treatments to hatching sites in non-cropland areas. Treatment in these areas is justified when grasshopper numbers reach or exceed 15 grasshoppers per square yard.*

Common Name	Trade Name	Rate of formulated material per acre	Placement
beta-cyhalothrin	*Baythroid XL	2.0 to 2.8 fl oz	broadcast
chlorpyrifos + gamma-cyhalothrin	*Cobalt	7 to 13 fl oz	
dimethoate	Dimethoate	see product label	
chlorpyrifos	*Lorsban Advanced	1/2 to 1 pt	
gamma-cyhalothrin	*Proaxis	2.56 to 3.84 fl oz	
zeta-cypermethrin	*Mustang Max	2.8 to 4.0 fl oz	
carbaryl	Sevin XLR Plus	1 to 3 pt	
zeta-cypermethrin + chlorpyrifos	*Stallion	9.25 to 11.75 fl oz	
cyfluthrin	*Tombstone	2.8 to 4.0 fl oz	
lambda-cyhalothrin + chlorantraniliprole	*Voliam xpress	6.0 to 9.0 fl oz	
lambda-cyhalothrin	*Warrior II	1.28 fl oz	

***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.

Small Grasshoppers Numerous in Many Areas of Missouri

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SITE: Corn - GRASSHOPPER Complex

- *Comments: Control grasshoppers when they are small by applying spot treatments to hatching sites in field borders and grass waterways. Treatment is justified in corn field when 7 or more grasshoppers per square yard are present and foliage is being severely damaged. After pollen shed, control may be necessary if grasshoppers are damaging foliage above ear zone. Dimethoate should not be applied to corn during pollen-shed.*

Common Name	Trade Name	Rate of formulated material per acre	Placement	REI Hours	Pre-Harvest Intervals Days
esfenvalerate	*Asana XL	5.8 to 9.6 fl oz	foliage	12	21 (grain)
cyfluthrin	*Baythroid XL	1.6 to 2.8 fl oz	foliage	12	21 (grain or fodder) 0 (green forage)
bifenthrin	*Brigade 2EC	2.1 to 6.4 fl oz	foliage	12	30 (grain, fodder, graze)
chlorpyrifos + gamma-cyhalothrin	*Cobalt	7 to 13 fl oz	foliage	24	21 (grain or ears) 14 (graze or silage harvest)
deltamethrin	*Delta Gold 1.5EC	1.0 to 1.5 fl oz	foliage	12	21 (grain, fodder) 12 (cut forage or graze)
dimethoate	Dimethoate 4E	1 pt	foliage	48	28 (grain) 14 (forage)
zeta-cypermethrin + bifenthrin	*Hero	2.6 to 6.1 fl oz	foliage	12	30 (grain, stover, graze) 60 (forage)
chlorpyrifos	*Lorsban Advanced	1/2 to 1 pt	foliage	24	21 (grain, ears, forage, fodder)
chlorpyrifos	*Lorsban 4E	1/2 to 1 pt	foliage	24	21 (grain, ears, forage, fodder)
zeta-cypermethrin	*Mustang Max	2.72 to 4.0 fl oz	foliage	12	30 (grain, stover) 60 (forage)
chlorpyrifos	*Nufos 4E	1/2 to 1 pt	foliage	24	21 (grain or ears)
microencapsulated methyl parathion	*PennCap-M	2 to 3 pt	foliage	48	12 (grain, forage, graze)
zeta-cypermethrin + chlorpyrifos	*Stallion	9.25 to 11.75 fl oz	foliage	24	30 (grain) 60 (forage)
cyfluthrin	*Tombstone Helios	2.1 to 2.8 fl oz	foliage	12	21 (grain or fodder), 0 (forage)
lambda-cyhalothrin + chlorantraniliprole	*Volian xpress	6.0 to 9.0 fl oz	foliage	24	1 (forage) 7 (hay)
lambda-cyhalothrin	*Warrior II	1.28 to 1.92 fl oz	foliage	24	21 (grain), 1 (graze, forage) 21 (treated feed or fodder)

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SITE: Sorghum - *GRASSHOPPER* spp.

- *Comments: Control grasshoppers when they are small by applying spot treatments to hatching sites in field borders and grass waterways. Treatment in field is justified when 7 or more grasshoppers per square yard are present.*

Common Name	Trade Name	Rate of formulated material per acre	Placement	REI Hours	Pre-Harvest Intervals Days
cyfluthrin	*Baythroid XL	2 to 2.8 fl oz	grain head, foliage	12	14 (grain or graze)
chlorpyrifos + gamma-cyhalothrin	*Cobalt	7 to 13 fl oz	grain head, foliage	24	30 (grain, forage, fodder, hay, or silage)
gamma-cyfluthrin	*Declare	1.02 to 1.54 fl oz	grain head, foliage	24	30 (grain)
deltamethrin	*Delta Gold 1.5EC	1 to 1.5 fl oz	grain head, foliage	12	14 (grain, cut or graze forage)
dimethoate	Dimethoate 4E	1/2 to 1 pt	grain head, foliage	48	28 (grain) 14 (forage)
chlorpyrifos	*Lorsban Advanced	1/2 to 1 pt	grain head, foliage	24	30 (grain, forage, fodder, hay, or silage)
chlorpyrifos	*Lorsban 4E	1/2 to 1 pt	grain head, foliage	24	30 (grain, forage, fodder, hay, or silage)
zeta-cypermethrin	*Mustang Max	3.2 to 4.0 fl oz	grain head, foliage	12	30 (grain, stover) 45 (forage)
chlorpyrifos	*Nufos 4E	1/2 to 1 pt	grain head, foliage	24	30 (grain, forage, fodder, hay, or silage)
zeta-cypermethrin + chlorpyrifos-	*Stallion	9.25 to 11.75 fl oz	grain head, foliage	24	30(grain, stover) 45(forage)
cyfluthrin	*Tombstone Helios	2 to 2.8 fl oz	grain head, foliage	12	14 (harvest or graze forage)
lambda-cyhalothrin	*Warrior II	1.28 to 1.92 fl oz	grain head, foliage	24	30 (grain), 7 (graze) 30 (straw fed to livestock)

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Small Grasshoppers Numerous in Many Areas of Missouri

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SITE: Soybean - GRASSHOPPER Complex

- *Comments: Treat when defoliation reaches 30% before bloom, 20% bloom to pod fill, or when 5% to 10% of pods are damaged and hoppers are present. Treat when grasshoppers are small for optimal control.*

Common Name	Trade Name	Rate of formulated material per acre	Placement	REI Hours	Pre-Harvest Intervals Days
esfenvalerate	*Asana XL	5.8 to 9.6 fl oz	foliage	12	21 (grain) Do not graze or feed livestock
cyfluthrin	*Baythroid XL	2.0 to 2.8 fl oz	foliage	12	45 (grain, feeding dry vines) 15 (green forage)
bifenthrin	*Brigade 2EC	2.1 to 6.4 fl oz	foliage	12	18 (grain)
chlorpyrifos + gamma-cyhalothrin	*Cobalt	7 to 13 fl oz	foliage	24	30 (grain) Do not graze or feed livestock
dimethoate	Dimethoate 4EC	1 pt	foliage	48	21 (grain)
lambda-cyhalothrin + thiamethoxam	*Endigo ZC	3.5 to 4.5 fl oz	foliage	24	30 (grain) Do not graze or feed livestock
zeta-cypermethrin +	*Hero	2.6 to 6.1 fl oz	foliage	12	21 (grain) Do not graze or feed livestock
imidacloprid + cyfluthrin	*Leverage 2.7	3.8 fl oz	foliage	12	45 (grain, feeding dry vines) 15 (green forage)
chlorpyrifos	*Lorsban Advanced	1 to 2 pt	foliage	24	28 (grain) Do not graze or feed livestock
zeta-cypermethrin	*Mustang Max	3.2 to 4.0 fl oz	foliage	12	21 (grain) Do not graze or feed livestock
chlorpyrifos	*Nufos 4E	1/2 to 1 pt	foliage	24	28 (grain) Do not graze or feed livestock
acephate	Orthene 97	1/4 to 1/2 lb	foliage	24	14 (grain) Do not graze or feed livestock
microencapsulated methyl parathion	*PennCap-M	2 to 3 pt	foliage	96	20 (grain)
zeta-cypermethrin + chlorpyrifos	*Stallion	5.0 to 11.75 fl oz	foliage	24	28 (harvest) Do not graze or feed livestock
cyfluthrin	*Tombstone Helios	2.0 to 2.8 fl oz	foliage	12	45 (grain, feeding dry vines) 15 (green forage)
lambda-cyhalothrin	*Warrior II with Zeon	1.60 to 1.92 fl oz	foliage	24	30 (grain) Do not graze or feed livestock

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Small Grasshoppers Numerous in Many Areas of Missouri

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SITE: Wheat - GRASSHOPPER (numerous species)

- Comments: Treat when 8 or more adults per square yard are present within crop. Barrier treatments in border areas may be required to prevent migration into the crop if more than 20 adults per square yard are present in field margins.

Common Name	Trade Name	Rate of formulated material per acre	Placement	REI Hours	Pre-Harvest Intervals Days
cyfluthrin	*Baythroid XL	1.8 to 2.4 fl oz	foliage	12	30 (grain) 3 (grazing or forage)
dimethoate	Dimethoate 4EC	3/4 pt	foliage	48	35 (grain) 14 (grazing)
zeta-cypermethrin	*Mustang Max	3.2 to 4.0 fl oz	foliage	12	14 (grain, forage, hay)
microencapsulated methyl parathion	*PennCap-M	2 to 3 pt	foliage	48	15 (harvest or graze)
zeta-cypermethrin + chlorpyrifos	*Stallion	5.0 to 11.75 fl oz	foliage	24	14 (forage, hay) 28 (grain, straw)
cyfluthrin	*Tombstone Helios	1.8 to 2.4 fl oz	foliage		3 (forage), 30 (grain)
lambda-cyhalothrin Seed Treatments	*Warrior II with Zeon	1.28 to 1.92 fl oz	foliage	24	30 (grain or straw) 7 (hay or forage)

*Designates a restricted-use pesticide. Use is restricted to certified applicators only.

Read the label to determine appropriated insecticide rates, directions, precautions, and restrictions.

SITE: Grass Pastures - GRASSHOPPERS

- Comments: Control grasshoppers when they are small by applying spot treatments to hatching sites or in grass pastures. Treatment in these areas is justified when grasshopper numbers reach or exceed 7 grasshoppers per square yard.

Common Name	Trade Name	Rate of formulated material per acre	Placement	Pre-Harvest Intervals Days
zeta-cypermethrin	*Mustang Max	3.2 to 4.0 fl oz	Broadcast	0 (forage, hay), 17 (straw)
carbaryl	Sevin XLR Plus	1 to 4 pt	Broadcast	14 (harvest or grazing)
lambda-cyhalothrin + chlorantraniliprole	*Voliam xpress	6.0 to 9.0 fl oz	Broadcast	0 (harvest or graze)
lambda-cyhalothrin	*Warrior II	1.28 to 1.92 fl oz	Broadcast	0 (grazing or forage) 7 (hay)

*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.

SITE: Non-Cropland Areas - GRASSHOPPER 2010

- Comments: Control grasshoppers when they are small by applying spot treatments to hatching sites in non-cropland areas. Treatment in these areas is justified when grasshopper numbers reach or exceed 15 grasshoppers per square yard.

Common Name	Trade Name	Rate of formulated material per acre	Placement
esfenvalerate	*Asana XL	2.9 to 5.8 fl oz	Broadcast
zeta-cypermethrin	*Mustang Max	3.2 to 4.0 fl oz	Broadcast**
acephate	Orthene 75S	2 oz to 2 2/3 oz of soluble powder	Broadcast
carbaryl	Sevin XLR Plus	1 to 3 pt	Broadcast
lambda-cyhalothrin	*Warrior	2.56 fl oz, see dealer for rates	Broadcast

*Designates a restricted-use pesticide. Use is restricted to certified applicators only.

**Foliage must not be used for forage or grazed for all products listed except for Mustang Max which has a 0-day pre grazing interval.

Regardless of the formulation selected, read the label to determine appropriated insecticide rates, directions, precautions, and restrictions.

Forage of the Month: Crabgrass (*Digitaria ciliaris* (Retz.) Koel.)

By Rob Kallenbach

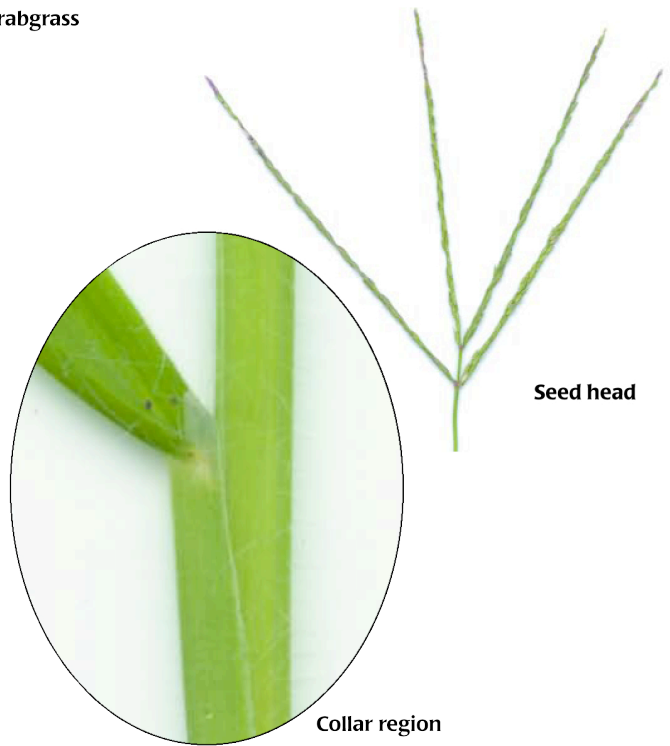
Crabgrass is a warm-season annual that is easy to establish. Stands of crabgrass can last almost indefinitely if managed to encourage volunteer reseeding. Although often considered a weed, crabgrass is a high-quality forage that can produce 6,000 to 10,000 lb/acre of dry matter

annually. The majority of the dry matter is produced from mid-June to August. Crabgrass is adapted statewide and tolerates poorly drained soils well but is not cold hardy. It responds well to split applications of nitrogen at establishment and then again after the first grazing.



Crabgrass in early spring

Crabgrass



Seed head

Collar region

Origin: Southern Africa

Adaptation to Missouri: Statewide

Growth habit: Sod-forming annual.

Blade: Leaf bud rolled. Leaves broad, open, flat, pubescent.

Sheath: Open with overlapping margins, shorter than internodes, pubescent.

Ligule: Thin truncate membrane, toothed margin, ~1/10 inch long. Shorter on first few blades.

Auricles: Absent.

Seed head: Slender spikes, several pairs arising from the tip of the stalk.

Fertilization: 40 lb N/acre at establishment. Apply 60 lb N/acre after first cutting or grazing. Phosphorus and potassium to soil test.

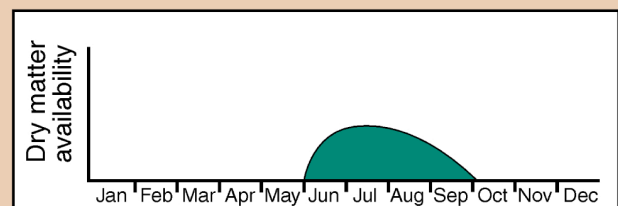
Timing of production: 80 percent between mid-June and August.

When to begin grazing: Before it reaches 10 inches in height.

When to cut for hay: Boot stage.

Lowest cutting or grazing height: 3 inches

Fall management: Remove grazing livestock from pasture two to three weeks before first frost to ensure adequate seed production.



Yield distribution of crabgrass in Missouri.

Weather Data for the Week Ending July 19, 2011

By Pat Guinan

Station	County	Weekly Temperature (°F)						Monthly Precipitation (in.)		Growing Degree Days‡	
		Avg. Max.	Avg. Min.	Extreme High	Extreme Low	Mean	Departure from long term avg.	June 1-30	Departure from long term avg.	Accumulated Since Apr. 1	Departure from long term avg.
Corning	Atchison	92	77	95	70	84	+6	3.00	-0.22	1966	+269
St. Joseph	Buchanan	91	74	93	68	82	+4	2.57	-0.20	1887	+191
Brunswick	Carroll	90	75	95	69	82	+5	3.58	+1.07	1938	+203
Albany	Gentry	92	73	96	69	82	+5	1.15	-2.01	1843	+180
Auxvasse	Audrain	92	72	96	67	81	+4	1.37	-1.13	1941	+196
Vandalia	Audrain	92	71	97	66	81	+4	0.98	-1.83	1885	+183
Columbia-Bradford Research and Extension Center	Boone	92	71	96	68	81	+3	2.18	-0.58	1928	+130
Columbia-Capen Park	Boone	95	71	100	68	82	+3	0.89	-1.95	1946	+86
Columbia-Jefferson Farm and Gardens	Boone	92	72	97	69	82	+4	1.58	-1.19	1977	+177
Columbia-Sanborn Field	Boone	93	74	98	69	83	+4	1.09	-1.75	2092	+231
Columbia-South Farms	Boone	91	72	96	69	81	+3	1.55	-1.27	1968	+169
Williamsburg	Callaway	92	71	96	68	81	+4	2.23	-0.80	1957	+260
Novelty	Knox	90	71	97	66	80	+3	1.42	-1.11	1744	+59
Linneus	Linn	91	72	97	68	81	+4	1.63	-1.33	1804	+161
Monroe City	Monroe	91	71	98	66	80	+3	0.35	-2.04	1834	+108
Versailles	Morgan	94	73	100	69	83	+5	0.69	-1.94	2129	+285
Green Ridge	Pettis	93	73	99	69	83	+5	1.48	-1.22	2014	+242
Lamar	Barton	94	73	98	71	83	+4	2.84	-0.22	2189	+273
Cook Station	Crawford	92	70	97	68	80	+3	0.82	-1.16	2046	+191
Round Spring	Shannon	91	69	94	68	79	+2	2.80	+0.59	1986	+212
Mountain Grove	Wright	90	70	93	68	80	+4	2.59	+0.40	1995	+272
Delta	Cape Girardeau	92	72	95	70	81	+2	1.65	-0.32	2257	+149
Cardwell	Dunklin	92	73	94	73	82	+2	1.90	+0.14	2512	+201
Clarkton	Dunklin	92	73	94	72	82	+2	1.82	-0.08	2447	+177
Glennonville	Dunklin	92	73	94	73	82	+2	2.06	+0.14	2442	+181
Charleston	Mississippi	91	73	95	71	82	+3	1.24	-1.16	2342	+234
Portageville-Delta Center	Pemiscot	92	75	96	73	83	+3	0.93	-0.78	2533	+243
Portageville-Lee Farm	Pemiscot	92	74	94	73	83	+3	1.69	-0.18	2520	+248
Steele	Pemiscot	*	*	*	*	*	*	*	*	*	*

* 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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Insect Pest & Crop Management newsletter is published by the MU IPM Program of the Division of Plant Sciences Extension. Current and back issues are available on the Web at <http://ppp.missouri.edu/newsletters/ipcmindex.htm>. Mention of any trademark, proprietary product or vendor is not intended as an endorsement by University of Missouri Extension; other products or vendors may also be suitable.

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