Early-Season Wheat Disease Management Considerations, Fall 2013

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It is that time of year again. The corn crop is long gone, the majority of soybeans and cotton have been harvested, and many producers’ thoughts turn to the great outdoors. But before you pick-up your hunting or fishing gear and head to the woods or lake, there are a few more things to consider if wheat production is on the “to-do” list. With prices nearing $7.00/bushel at the time of this writing and projected to be between $6.00 and $7.00 next June, winter wheat production has considerable potential in Louisiana.

One of the most important considerations when planting wheat is variety selection. Resistant varieties are our best tool for disease management. Significant diseases such as leaf, stripe, and stem rust may be effectively avoided by planting resistant wheat varieties. The LSU AgCenter provides ratings for these diseases, and others, from variety trials at research stations located throughout the state. Summaries of variety performance are available at your local extension office, research station, or online at: http://www.lsuagcenter.com/en/crops_livestock/crops/WheatOats/. When choosing varieties, be certain to select one that was evaluated nearest to your farm location. High-yielding, rust-resistant varieties are of paramount importance in Louisiana wheat production. Make sure that up-to-date varietal information is used, because some pathogens, rust pathogens in particular, have the ability to overcome resistance in wheat varieties.

Considerations other than variety selection may also play an important role in managing diseases in Louisiana wheat. Crops such as corn and grain sorghum may serve as alternative hosts for wheat pathogens. For example, corn and grain sorghum may harbor the pathogen that causes Fusarium head blight (scab), which is a significant problem in southwestern Louisiana. Consequently, past disease and recent crop history are important considerations in wheat production. Weeds, alternate hosts, and volunteer wheat may also provide refuge for wheat pathogens; therefore, vegetation management is important. Previous crop debris, particularly wheat stubble/residue, may aid in off-season survival for numerous wheat pathogens, so any practice that reduces debris may reduce the chances of disease development. Ensuring a well-drained seed bed is particularly important for managing diseases caused by late-season stripe rust (Steve Harrison).
*Pythium/Phytophthora* species (damping-off, downy mildews) as these pathogens are favored by wet soils. Finally, proper fertility will promote healthy plant development, which, in turn, lessens the likelihood of disease development.

Although seed treatments are seldom needed for wheat establishment in Louisiana, many fungicide seed treatment options are available to producers for management of numerous seedling and early-season diseases. Seed treatments containing metalaxyl or mefenoxam are generally effective against diseases caused by *Pythium/Phytophthora* spp. (damping-off, downy mildews). Broad spectrum fungicides with multiple modes of action against seed decays, damping-off, seedling blights, bunts, smuts, crown rots, and root rots include: captan (not effective against bunts/smuts), carboxin, difenconazole, fludioxonil, imazalil, mancozeb, maneb, tebuconazole, thiabendazole, thiram, triadimenol, and triticonazole. A broad-spectrum fungicide with a specific mode-of-action commonly used in wheat seed treatment to control the aforementioned diseases and specifically, *Rhizoctonia solani*, is azoxystrobin. One commercially-available biological control, *Bacillus subtilis*, may be used in conjunction with other fungicides for suppression of *Fusarium* and *Pythium* spp.

Seed treatment of wheat should be considered on a field-by-field basis.Growers should consult with their seed provider to determine available fungicide seed treatment options, if warranted. In general, fungicide seed treatments with two or more modes-of-action should be considered. Based on research conducted at Macon Ridge Research Station in 2008 and 2011, fungicide seed treatments occasionally result in increased stand. However, under low disease pressure and optimal conditions, seed treatment fungicides are usually not effective on later-occurring diseases and yield. Conversely, in cases where field history of disease exists, susceptible varieties are planted, and prevailing environmental conditions favor disease development, fungicide seed treatments may be effective.

**Early Season Insect Control in Wheat**

Sebe Brown and David Kerns

With fall harvest coming to a close, producers should be aware of the options that are available for early season insect control in wheat. Wheat, like other commercially available crops, comes with a variety of systemic insecticide seed treatments (IST) that are tailored to control insects above and below the soil surface. Wheat ISTs and numerous cultural practices are LSU AgCenter best management practices that can help prevent insect and disease issues as the season progresses.

**Wireworms**

Insecticide seed treatments offer protection from below ground insects such as wireworms. Wireworms are slender, hard bodied, wire like insects that are the immature stage of click beetles. These insects are shiny brown in color and typically ½ inch to 1 ½ inches in length. Wireworms will frequently build large populations in reduced tillage, sandy fields that have not been rotated (ie. corn behind corn). Wireworms typically attack wheat seeds before and during germination and injury is often exacerbated by poor environmental conditions slowing wheat emergence. Individual wireworm larvae will occasionally follow drill rows causing injury to multiple seeds resulting in bare patches across a field. Wireworms can be a perennial problem and infestations are often sporadic and isolated to specific portions of a field.

**Wireworm Management**

Neonicotinoid insecticide seed treatments (such as ) are an effective management tool that can help greatly reduce injury to seedling wheat particularly if wireworms have been an issue in the past. Also, planting recommended seeding rates will help achieve optimal plant populations per square foot allowing
wheat to compensate and or recover from wireworm injury. Beware; there are no rescue treatments for wireworms.

**Aphids**
The most common aphids found on wheat are rice root aphid, bird cherry-oat aphid, corn leaf aphid and Russian wheat aphid. Green bug are rarely an issue in Louisiana and this is the only aphid species that causes direct feeding damage to wheat causing discoloration and speckling of leaves. Aphids also vector a disease named barley yellow dwarf virus (BYDV). Wheat can be severely affected by BYDV and infection can occur from seedling through heading; however, yield loss is greatest when seedling wheat is infected in the fall. The bird cherry-oat aphid and corn leaf aphid are the most important vectors of BYDV in the fall. Aphids will move, feed and reproduce when temperatures are above 48°F increasing the likely hood of virus transmission. Dense stands in the fall caused by excessive nitrogen fertilization can cause an increase in aphid activity leading to greater infection rates of BYDV as well.

![Greenbug aphids: Photo by S. Stewart UT](image)

**Aphid Management**
Planting date has a significant impact on aphid infestation and BYDV infection in the fall. Earlier plantings will generally have greater aphid numbers and a greater incidence of BYDV. Furthermore, ISTs are an effective fall insect control option that will help protect seedling wheat from aphid populations and reduce insect induced stress as the season progresses into the winter months. The ISTs Gaucho 600 at 1.6 fl. oz./100 lb of seed, Cruiser 5FS at 1.33 fl. oz./100 lb of seed and Nipsit at 1.79 fl. oz./100 lb of seed are options available to producers. These treatments will help control fall infestations of aphids, however; do not expect these treatments to provide spring insect control from stink bugs, armyworms, Hessian flies, or migrating aphids.

Foliar applications to control aphids are usually unnecessary when wheat varieties are planted during the recommended planting interval in Louisiana or when an IST is used. However, if wheat is planted too early, a foliar application may be justified if aphids get an unusually early start; scouting can help determine this decision. As such, the threshold for greenbug in Louisiana is as follows: plants with less than three tillers treat when 50 or more aphids are present per linear foot, plants with 3 or more tillers 3 – 6 inches tall treat when 100 – 300 or more aphids are present, plants 6 -10 inches tall treat when 300 – 500 aphids or more are present.
Hessian Fly
The Hessian fly is a serious pest of wheat worldwide and Louisiana is no exception. Although the number of generations of Hessian fly per year in Louisiana is unknown, four to six generations may occur in the southern United States. Hessian flies are small, long legged, black flies that resemble mosquitoes. Adults live for two days and oviposit their eggs in the grooves on the upper sides of leaves. Neonates are orange to red in color and move in between the stem and leaf sheath where they begin to feed. Injury in wheat is caused only by the Hessian fly larvae which can lead to stunting and eventual death of vegetative stage tillers. In headed stems, injury can weaken the stems resulting in reduced grain fill and increased stalk breakage. Once larvae move into the stem they are protected from insecticides and weather.

Hessian Fly Management: For the most effective control of Hessian fly a multi-tiered approach should be utilized. Tillage, crop rotation, planting during the recommended interval, use of resistant varieties, volunteer wheat destruction, cover crop choice and preventative insecticide applications will provide the most effective level of control.

Tillage: Burying wheat stubble with conventional tillage effectively kills aestivating (over-summering) pupae. Reduced and no-till ground preparation leaves stubble on the soil surface that can greatly increase Hessian fly numbers. Burning stubble, after harvest, may not effectively control aestivating Hessian flies either. Stubble burning must be combined with disking to bury the pupae.

Crop Rotation: Avoid planting wheat in last season’s wheat stubble. Continuously planting wheat in the same field can significantly increase Hessian fly populations. Prevent volunteer wheat from establishing
in previous wheat fields during the fall since this often provides the inoculum source for nearby wheat fields.

**Recommended Planting Date:** Louisiana has no “fly free” date for Hessian flies; therefore, planting during the LSU AgCenter’s recommended planting interval optimizes agronomic performance. Wheat planted early is more likely to be affected by insects in the fall than late planted wheat.

**Planting Hessian Fly Resistant Varieties:** Planting a Hessian fly resistant variety is the single most effective way to manage Hessian fly in Louisiana. Resistant varieties exist for use in Louisiana, however; as resistant varieties are released new Hessian fly biotypes emerge. Louisiana has numerous biotypes of Hessian fly and a multi-disciplined approach revolving around the integration of resistant varieties with other production practices help reduce injury to wheat.

Volunteer Wheat and Cover Crops: Volunteer wheat plants serve as reservoirs for Hessian flies. Destruction of volunteer plants along field borders, in early fall, will help reduce populations of these insects and help prevent yield loss in the spring. Susceptible wheat varieties planted early for cover crops or wheat planted for wildlife plots harbor Hessian flies as well. If possible, use rye or oats instead of wheat as a cover crop and plant non-host crops such as oats, ryegrass and rye for grazing. Use of alternative, non-host crops and destroying volunteer wheat helps reduce Hessian fly populations on an area wide basis limiting the amount of potential injury neighboring fields may receive.

**IST for Control of Hessian Fly:** Insecticide seed treatments are an effective control measure for Hessian flies in Louisiana if applied at a higher rate than the ones typically recommended for aphids. The ISTs Gaucho 600 at 1.6 fl. oz./100 lb of seed, Cruiser 5FS at 1.33 fl. oz./100 lb of seed and Nipsit at 1.79 fl. oz./100 lb of seed are options available to producers. Seed treatments will suppress fall infestations but will not prevent infestations of winter or spring Hessian fly populations. All IST rates given in this article are rates recommended for the control of Hessian fly by the LSU AgCenter. Use of resistant varieties may not require the increased Hessian fly rate of IST for aphids.

**Foliar Applications for Hessian Fly:** Applications of a pyrethroid have been demonstrated to suppress Hessian fly populations if applied while adults are ovipositing eggs on leaves, eggs are present on leaves and before larvae move into the stalk. Research from North Carolina demonstrated that an application made at the 2 – 4 leaf stage significantly reduced fall infestations. This management approach may be more suitable for susceptible varieties that are routinely scouted for insects and have not been treated with an IST. Early planted varieties, wheat following wheat or fields where Hessian fly has caused yield loss in years prior may benefit from a fall application. Correctly timing insecticide applications to coincide
with larval emergence and adult oviposition may be difficult. Once larvae emerge and migrate into the stalk pyrethroid applications are ineffective.

For more information or if you have any questions or concerns contact your local parish extension office or extension specialist.

**Early Season Cultural Management Practices for Winter Wheat Production**

**Ed Twidwell, Steve Harrison, and Josh Lofton**

**Planting Practices**
Recommended planting dates for wheat range from October 15 to November 15 in north Louisiana and from November 1 to November 30 in central and south Louisiana. Planting wheat earlier than the recommended planting dates will subject the plants to greater insect and disease pressure and also makes the plants more prone to winter injury due to excessive fall growth. While planting later than current recommendations may have minimal detrimental effects, late planted wheat often does not have the yield potential of wheat planted at a normal date because the plant does not have adequate time as a seedling to develop tillers and a root system before cold weather limits growth or warm spring weather causes initiation of heading. The term “late-planted” is typically applied to wheat seeded after December 1 in north Louisiana and after December 15 in South Louisiana.

The amount of yield reduction with late planting depends on several factors including:

1) **How late the wheat is planted.** Most wheat varieties adapted to Louisiana will head out and make a crop if planted before January. They really do not require a lot of cold weather (vernalization). It takes about 3-6 weeks of vernalization, which we get every year. Non-adapted (long-vernalization) varieties may require up to 8 weeks and will not head out in Louisiana if planted late or the winter is particularly warm. Vernalization occurs with night or daytime temperatures between 32 and 50F. The greatest impact of late-planting is to shorten the vegetative development period. The delay in heading date is generally less than the delay in planting, and the delay in harvest is generally less than the delay in heading since heat forces the crop to mature. The reduced yield with late-planting occurs due to reduced tillering, smaller plant systems including heads, and later heading which results in grain fill under heat stress. The ‘deeper’ into the late-planting period a grower goes, the less likely he is to make an economic yield, and this is a function of grain price or break-even yield.

2) **Variety Choice.** Late-heading varieties should not be planted late because they will head out even later and will be forced to set seed and fill grain under heat stress, resulting in lowered yield, lowered test weight, and delayed harvest. The best varieties for late-planting are those with earlier than average heading dates and high grain yield. These varieties will head out at near-normal dates and will go through grain fill sooner and be ready for harvest on time.

3) **Seeding Rate.** As stated above, one of the impacts of late-planting is to reduce tillering. This can be partially offset by increasing seeding rate. A seeding rate of 70-90 pounds for drilling and 90-120 pounds per acre for broadcast is about right for planting at an ideal date. These rates should be increased to 90-120 and 120-180 pounds when planting late or in poor soil conditions, with seeding rates increasing with lateness. The offset achieved with higher seeding rates is more effective for earlier varieties than for later ones. Earlier varieties are going to be triggered to
initiate head formation before they adequately tiller when planted late, so having more plants per unit area can compensate for fewer heads per plant. Late-heading varieties probably will not respond to higher seeding rates because they have a longer vegetative period and will tiller at a normal seeding rate, but will suffer due to late heading.

4) **Fertility, Drainage, and Weed Control.** Wheat that is planted late needs to come out of the ground and have the maximum opportunity to grow. Anything that stresses the plant will reduce yield, including inadequate fertility, weed competition, and poor drainage. Late-planted wheat will probably benefit from 20-30 pounds of pre-plant N to stimulate tillering, depending on how late it is planted and how much residual N is in the soil. Weed control and drainage should be optimum to prevent stress that will slow crop growth. Many of the problems we have with late-planted wheat occur because the crop sits in cool, waterlogged soils and cannot access nutrients until spring. The crop just sits there in the winter and then puts up heads from very small plants in the spring. Wheat will tiller and grow all winter if we give it the opportunity.

5) **Planting Depth and seed treatment.** I generally recommend a 0.75” – 1.0” planting depth at a normal date for wheat, depending on soil type and weather conditions. Stand establishment in late planted wheat can be a problem due to cold, wet soils. Wheat planted into a cold soil takes longer to germinate, which increases the probability of a heavy rain sealing the soil and resulting in rotten seed with poor germination. Heavier soils are more prone to stand problems than lighter soils. With heavier soils and later planting, growers should plant shallower, in the 0.5” – 0.75” range. This allows the seed to warm with the soil surface for faster germination, and lessens the likelihood of seed rot due to lack of oxygen.

6) **Weather Patterns.** Late-planted wheat will perform better in a year with a relatively dry winter (promotes tillering) and a cool spring. Wheat yields are always greater when spring temperatures are below normal as this promotes grain fill and large seed size.

**Tips for Late Planting:**
1. Use a burndown herbicide and prevent weed competition.
2. Increase seeding rate.
3. Provide good surface drainage; avoid heavy, poorly drained fields.
4. Ensure N is applied at planting.
5. Plant high-yielding, early-heading varieties.
6. Use a fungicide seed treatment and plant shallower.

Planting wheat with a grain drill is the preferred method because it allows uniform depth of planting and results in a more uniform stand. A seeding rate of 60 to 75 pounds per acre of high quality seed planted into a good seedbed with adequate moisture is satisfactory for drilling. Adjust the seeding rate up from 75 to 120 pounds per acre for broadcast planting, late planting, or planting into a poorly prepared seedbed.

**Fertility**
Fall fertilization and liming should be carried out to supply any needs indicated by soil testing. Phosphorus and potassium, where recommended, should be incorporated into the seedbed before planting. If lime is recommended, apply before seedbed preparation if possible. Fall application of nitrogen is usually not needed where wheat follows soybeans. Where wheat follows corn, sorghum or rice, application of 15 to 20 pounds of nitrogen per acre may be beneficial.

**Weed Management in Wheat**

Dr. Daniel Stephenson
During the time that producers are planting wheat, numerous grass and broadleaf weeds such as Italian ryegrass, annual bluegrass, buttercup, chickweed, cudweed, shepherd’s-purse, etc., have already emerged or will emerge with the wheat. Weeds will compete with wheat for light and water, interfere with harvest, reduced grain quality due to contamination, or raise moisture content of harvested grain.

The first step in a weed management program in wheat is to start clean. Utilize either tillage or a nonselective herbicide to control weeds prior to planting. Finesse at 0.5 oz/acre is a preemergence herbicide the will provide good control of annual bluegrass, henbit, swinecress, buttercup, bittercress, cutleaf eveningprimrose, and chickweed. However, only STS soybeans can be planted the following year if soybean will be double-cropped following wheat harvest. Also, do not apply Finesse if wheat is broadcast seeded. Metribuzin 75 DF (numerous trade names) at 2-3 oz/acre applied postemergence to 2-3 leaf wheat provides good control of annual bluegrass, henbit, buttercup, shepherd’s-purse, bittercress, and chickweed. Be aware that there is differential susceptibility among wheat varieties to metribuzin. Mississippi State University has published the latest data listing ratings for metribuzin sensitivity. This data can found at [http://msucares.com/pubs/infobulletins/ib0478.pdf](http://msucares.com/pubs/infobulletins/ib0478.pdf) on pages 25 and 26. Also, do not apply metribuzin if broadcast seeding wheat.

In general, PowerFlex HL at 2 oz/acre is slightly better on broadleaf weeds than Osprey at 4.75 oz/acre, but Osprey is better on annual bluegrass. Both control Italian ryegrass. 2,4-D at 0.5-1.0 lb ai/acre provides excellent control of numerous broadleaf weeds, but it must be applied prior to panicle initiation. If wild garlic and other broadleaf weeds are an issue, Harmony Extra SG at 0.7-0.9 oz/acre is a good option, but it will only provide 70% control of wild onion.

Herbicide applications in the fall are typically focused primarily on broadleaf weed control, annual bluegrass, and Italian ryegrass. Applications in the spring typically focus on Italian ryegrass; however, sometimes broadleaf weeds are a concern if nothing was done in the fall. Articles will be written in the early spring discussing spring herbicide applications.