Plant & Soil Sciences Extension Newsletter

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Plant & Soil Science Extension

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Winter feeding and pasture options

By Daren Redfearn

The most common winter-feeding option is to feed hay during the winter. While it is less risky than any of the other available options and requires the least amount of planning, it can also be the most expensive. During a 4-month hay-feeding season (120 days), a 1200-pound cow will consume approximately 30 pounds of hay each day. This means that each cow will require between 3 and 4 round hay bales weighing at least 1100 pounds. One disadvantage is that cattle can waste up to 50% of the hay fed if it is not fed in a feeder or ring. In this case, the number of hay bales required will double to between 6 and 8 round bales for each cow.

One option to reduce the amount of hay fed during the winter is growing stockpiled forages. Stockpiled forage is simply forage that is allowed to accumulate in the pasture for grazing when production is slow during the winter months. The out-of-pocket cost for growing stockpiled forages is the fertilizer cost plus any application cost. However, this is more risky than feeding hay, because the success depends entirely on rainfall. When successful, the cost of grazing stockpiled forage per animal unit is oftentimes lower than the cost of feeding hay or the cost of feeding protein supplement on dry grass.

Pasture preparation is key to producing quality fall-grown forages. Summer growth of bermudagrass should be removed by late August through grazing, haying, or mowing. Application of 50 to 75 pounds of actual N per acre in late August to short bermudagrass to take advantage of late summer rainfall can supply one ton of forage per acre. This stockpiled forage can be grazed prior to February to reduce the length of the hay-feeding season. One acre of stockpiled bermudagrass will provide grazing for one cow for approximately 45 days.

Where adapted, tall fescue can also be used as a stockpiled forage and the management is similar to bermudagrass. The two major differences are the amount of N fertilizer applied and the grazing period. Seventy five to 100 pounds of actual N per acre should be applied by early September to take advantage of late summer rainfall. Similar to bermudagrass, fall production is highly dependent on rainfall. Stockpiled tall fescue can be grazed from late-December through February. One acre of fall-fertilized tall fescue will provide grazing for one cow for approximately 45 days.

Sod seeding small grains are not dependable for fall and winter grazing, but are still good options for grazing in mid spring before growth of summer pasture begins. This results from lack of dependable rainfall and competition from other grasses. Annual cool-season grasses can be planted on a clean tilled seedbed in late summer to provide grazing during late fall through late spring. Planting a combination of 2 or more species would increase the distribution of forage production. Annual establishment costs for cool-season annual grasses cause this option to cost more than stockpiling either bermudagrass or tall fescue, but this can still be less costly than feeding hay for an extended period of time.

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Options for marestail control this fall and winter

By Joe Armstrong

Marestail has become a problem weed in nearly all crops grown in Oklahoma because of the long period during which the seeds can germinate. Typically, marestail is thought to be a winter annual—that is, it germinates in the fall, survives through the winter, and then produces seed the next spring or summer. However, in the last few years, we have seen a shift in marestail and it now behaves as both a winter annual and a summer annual, germinating and growing on a nearly year-round basis, making it extremely difficult to control with a single burndown application.

The most important part of controlling marestail, regardless of the crop, is *timing*. Like most weeds, marestail plants are easiest to control when they are very small. This means that herbicides should be applied when plants are in the rosette growth stage or soon after they have bolted and begun their upward growth (Figure 1).

Figure 1 - Marestail, like most weeds, is easiest to control with herbicides when the plants are very small. Herbicides should be applied when the plants are in the rosette growth stage or very soon after they have bolted.

In wheat, we have several herbicide options for marestail control. Finesse, Amber, and Harmony Extra will do a great job on small marestail. Growth regulator herbicides, such as 2,4-D, MCPA, and dicamba (Banvel), will also do a good job, but remember that these herbicides should be applied after tillering but before jointing to avoid potential crop injury. In general, marestail is not a major yield-robbing weed in wheat; however, if you are planning on planting a double-crop the next summer, it is especially important to control the marestail in the wheat crop. Simply put, there are few good rescue options in summer crops for large marestail that have survived through the spring and early summer (Figure 2).

Figure 2 - Large marestail plants present at wheat harvest will continue to be problematic throughout the summer and will plague any following crops. There are several herbicide options available that will provide good to excellent control of marestail in wheat.

If you are leaving fields fallow through the winter and will plant a crop next spring, I would recommend controlling marestail before you begin planting preparations next year. Many producers have started making burndown applications of glyphosate and 2,4-D in the late fall or winter to control early flushes of marestail and other winter weeds. A more aggressive tactive is to use fall-applied herbicide treatments that have soil residual activity to control weeds and prevent any germination through the winter. These treatments will not replace burndown applications or preemergence

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Youth opportunities in plant science at the fair

By Sarah Lancaster

The temperatures outside are still sweltering, but soon autumn will bring some relief from the heat and with it will come the season for Oklahoma and Tulsa State Fairs. This year, the Oklahoma State Fair begins September 16 and will run through September 26. The 2010 Tulsa State Fair will be held September 30 through October 10. While many people are familiar with the carnival rides and livestock shows associated with the fair, fewer are aware of the activities in the area of plant science.

There are several ways for 4-H members to develop life skills, gain knowledge and compete for monetary prizes in plant science related activities. The first area is the project exhibit. The projects exhibited at the state fair are blue-ribbon projects from county fairs across the state. There are two main categories of project exhibits, field crops and forages. Field crop exhibits consist of displaying produce such as corn ears, cotton bolls, wheat grain, or alfalfa seed grown by the 4-Her. These displays are typically exhibited in a 1 gallon jar. Youth can also exhibit forage displays. These displays have dried specimen of native or introduced forages neatly arranged on a 3 foot by 3 foot board. Other 4-H members may want to enter a peanut information exhibit that increases public awareness of one segment of the peanut industry.

The second opportunity is the Crops Judging Contest held at the Oklahoma State Fair. This contest will be held at 10:00 am on Saturday, September 18th in Barn 9. In one section of the contest, youth will identify crops and weeds that are found in Oklahoma. 4-Hers in the junior division will identify only plant specimen, while senior division contestants will identify both plants and seeds. The second phase of the contest will consist of correctly ranking judging classes of crops grown in Oklahoma. Both juniors and seniors will participate in this section of the contest.

I hope you will encourage youth in your county to participate in the 4-H plant science activities in your county and at the state fair you attend! Specific rules, deadlines for entry, award information, and eligibility requirements for both the Oklahoma and Tulsa State Fair can be found at *http://oklahoma4h.okstate.edu/events/statefair.htm*. Additional information can be obtained by contacting your county Extension office.

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Marestail control (cont.)

herbicides used at planting in the spring or early summer, but will reduce weed populations and make weed control with the burndown applications much easier. There are many soil-applied herbicides that are labeled for fall applications; however, many of them carry rotation restrictions that may limit your options for crops the following spring. Be sure to check the label for use rates and rotation restrictions.

Again, the key to successfully control marestail is to be timely with herbicide applications. Weeds should be controlled when they are small—if you wait until the marestail are more than six inches tall, do not expect to achieve great results with any herbicide treatment.

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Factors to consider when sowing wheat early

By Jeff Edwards

It is late August and the recent scattered showers have some producers chomping at the bit to get wheat in the ground. It is certainly not too early to sow wheat if forage production is the only objective, but there are a few important items to consider before those drills start rolling. I will discuss a few of the most important considerations below.

Impact on grain yield – The optimal planting window for grain-only wheat production begins in late September in the Panhandle and early October in the rest of the state. A yield penalty is generally associated with wheat that is sown earlier than this optimal window, and the penalty gets larger as planting gets earlier. This is not a problem for forage-only producers, but dual-purpose producers will benefit most years by delaying planting until September 10.

Hot soils can hinder germination – High temperature germination sensitivity refers to the inability of some varieties to germinate in hot soils. High temperature germination sensitivity is a temporary condition, and seed will generally go ahead and germinate once soils cool due to lower temperatures, cool rainfall, or irrigation. Since emergence is delayed, however, forage production can be negatively impacted and grazing might no longer be an option. Varieties with a high level of high temperature germination sensitivity are indicated with a '3' or '4' rating in Fact Sheet PSS 2142 – 2010 Wheat Variety Comparison Chart available at *www.wheat.okstate.edu.*

Don't plant too deep – The wheat coleoptile is a rigid, protective structure that covers the emerging shoot to aid it in reaching the soil surface. If the coleoptile does not reach the soil surface, the first leaf will unfold below the soil surface and the plant will take on an accordion-like appearance and die. The coleoptile length of modern, semi-dwarf varieties is much shorter than older, taller cultivars, and the coleoptile length is further shortened in hot soils. For this reason, most producers are better off 'dusting in' early-sown wheat as opposed to planting deep to reach moisture. A more thorough explanation of this issue can be found in Fact Sheet PSS 2256 – Factors affecting wheat germination and stand establishment in hot soils available at *www.wheat.okstate.edu.*

Consider moisture usage – There might be plenty of moisture available right now, but a lush wheat canopy can go through soil moisture quickly. So, it is important to consider how an early-fall drought might affect total forage production.

Insects might be worse – Early-sown wheat has a greater likelihood of being infested with a number of insect pests including Hessian fly, aphids, cutworms, and armyworms. Because of this greater likelihood, early-sown wheat should be scouted intensively and an insecticide seed treatment should be considered.

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How to fertilize triticale

By Hailin Zhang

Triticale is a hybrid of wheat and rye. It is considered to have greater forage yield potential than wheat and the environmental tolerance of rye. It has been grown in Oklahoma as a forage crop, although in small acreage compared to other forage crops. The nutritive values of triticale hay are comparable to winter wheat forage harvested prior to seed maturity (Table below). However, there is no official fertilizer recommendation for triticale in Oklahoma.

Based on the crude protein content, triticale removes about 45 lbs of nitrogen per ton of hay. Assuming the N use efficiency is 70% for the forage production, it requires about 64 lbs of N to raise one ton of triticale hay. This amount is close to the 60 lbs of N per ton we currently recommend for other cool-season forages such as fescue, ryegrass and wheat.

Phosphorus (P) and potassium (K) needs are based on the sufficiency levels of those nutrients in the soil. Since triticale is closely related to wheat and rye, the current P and K recommendation for winter wheat should be applicable to triticale. Although the most suitable pH for triticale is not well understood, it is clear that low soil pH has a dramatic impact on wheat forage yields. Therefore, it is important to lime the soil at least to the level recommended for wheat.

In summary, triticale hay requires 60 lbs of N per ton of forage. The requirements for P, K and pH are similar to winter wheat.

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Nutritive values (at 11% moisture) of triticale hay harvested in Western Oklahoma, 2010.

Crude Protein	Acid Detergent Fiber	Total Digestive Energy	Phosphorus	Calcium
14%	32%	53%	0.27%	0.48%

Effect of planting date and seed treatment on diseases and insect pests of wheat

By Bob Hunger, Jeff Edwards, Tom Royer and Terry Pitts

Approximately 40 to 60% of the winter wheat in Oklahoma is sown with the intent of being used as a dual-purpose crop. In this system wheat is grazed by cattle from late October to early March and harvested for grain in early summer. In a grain-only system, wheat is generally planted in October, but in a dual-purpose system wheat is planted in early to mid-September to maximize forage production. Planting wheat this early significantly increases the likelihood that diseases such as wheat streak mosaic virus, high plains virus, the aphid/barley yellow dwarf virus complex, and root and foot rots will be more prevalent and more severe.

Wheat streak mosaic virus (WSMV), the high plains virus (HPV), and Triticum mosaic virus (TrMV): WSMV and HPV are transmitted by the wheat curl mite (WCM). Within the last 2-3 years, Dr. Dallas Siefers with Kansas State University at Hays, KS identified a third virus, TrMV that also is transmitted by the WCM. TrMV causes the expression of symptoms similar to those caused by WSMV and HPV.

WCMs and these viruses survive in crops such as wheat and corn, as well as many grassy weeds and volunteer wheat. In the fall, WCMs spread to emerging seedling wheat, feed on that seedling wheat, and transmit the virus to the young wheat plants. Wheat infected with WSMV, HPV, or TrMV in the fall is either killed by the next spring or will be severely damaged. No seed treatments are effective in controlling these viruses. However, planting later in the fall (after October 1 in northern OK and after October 15 in southern OK) and controlling volunteer wheat are two practices that provide some control. It is critical to completely destroy volunteer wheat at least two weeks prior to emergence of seedling wheat because WCMs have a life span of 7-10 days. Thus, destroying volunteer wheat at least two weeks prior to emergence of seedling wheat should greatly reduce mite numbers in the fall. In addition to these cultural controls, two winter wheat varieties (RonL from Kansas and Mace from Nebraska) now have resistance to WSMV; however, their adaptation to production in Oklahoma is not known. For more information on WSMV and HPV, see OSU Extension Facts 7636 or go to the Plant Disease & Insect Diagnostic Laboratory web page at: *http://www.ento.okstate.edu/ddd/hosts/wheat.htm.*

Aphid/barley yellow dwarf virus (BYDV) complex: BYDV is transmitted by many cereal-feeding aphids. Fall infections by BYDV are the most severe because the virus has a longer time to damage the plant as compared to infections that occur in the spring.

Several steps can be taken to help control BYDV. First, a later planting date (after October 1 in northern Oklahoma and after October 15 in southern Oklahoma) helps to reduce the opportunity for fall infections. Second, some wheat varieties (e.g., 2174, Duster, Endurance, Overley, Everest) seem to tolerate BYDV better than other varieties; however, be aware that no wheat variety has absolute resistance to the aphid/BYDV complex. Third, control the aphids that transmit BYDV. This can be done by applying contact insecticides to kill aphids, or by treating seed before planting with a systemic insecticide. Unfortunately, by the time contact insecticides are applied, aphids frequently have already transmitted BYDV. Systemic seed-treatment insecticides

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Effect of planting date, seed treatment (cont.)

including Gaucho (imidacloprid) and Cruiser (thiamethoxam) can control aphids during the fall after planting, but in some years aphids are sparse in the fall and planting insecticide-treated seed in a year with no or sparse aphids in the fall would not be as beneficial as in years when aphids are numerous. Be sure to thoroughly read the label before applying any chemical. For more information on the aphid/barley yellow dwarf virus complex, go to the web page for the Plant Disease and Insect Diagnostic Laboratory at: *http://www.ento.okstate.edu/ddd/hosts/wheat.htm.*

Hessian fly: Hessian fly infestations occur in the fall and spring. Fall infestations arise from over-summering pupae that emerge when climate conditions become favorable. Delayed planting (after October 1 in northern Oklahoma, and after October 15 in southern Oklahoma) can help reduce the threat of Hessian fly, but a specific "fly free date" does not exist for most of Oklahoma as it does in Kansas and more northern wheat-growing states. This is because smaller, supplementary broods of adult flies emerge throughout the fall and winter. Some wheat varieties are either resistant (e.g. Duster and Centerfield) or partially resistant (e.g. Hatcher, Shocker, 2145, 2174, Chisholm, Ike, OK 102 and Okfield) to Hessian fly infestations. Hessian fly infestations can be reduced somewhat by destroying volunteer wheat in and around the field at least two weeks prior to emergence of seedling wheat. Seed treatments that contain imidacloprid or thiamethoxam will also help reduce fly fall infestations,

especially if combined with delayed planting and volunteer destruction.

Root and foot rots: These include several diseases caused by fungi such as dryland (Fusarium) root rot, Rhizoctonia root rot (sharp eyespot), common root rot, take-all, and eyespot (strawbreaker). Controlling root and foot rots is difficult. There are no resistant varieties, and although fungicide seed treatments with activity toward the root and foot rots are available, their activity usually involves early-season control or suppression rather than control at a consistently high level throughout the season. Often, there also are different "levels" of activity related to different treatment rates, so again, CAREFULLY read the label of any seed treatment to be sure activity against the diseases and/or insects of concern are indicated, and be certain that the seed treatment(s) is being used at the rate indicated on the label for activity against those diseases and/or insects.

Later planting (after October 1 in northern Oklahoma and after October 15 in southern Oklahoma) also can help reduce the incidence and severity of root rots, but planting later will not entirely eliminate the presence or effects of root rots. If you have a field with a history of severe root rot, consider planting that field as late as possible or plan to use it in a "graze-out" fashion if that is consistent with your overall plan.

For some root rots, there are specific factors that contribute to disease incidence and severity. For example, a high soil pH (>6.5) greatly favors disease development of the root rot called take-all. OSU soil test recommendations factor in this phenomenon by reducing lime recommendations when continuous wheat is the intended crop. Another practice that can help limit take-all and some of the other root rots is the elimination of residue. However, elimination of residue by tillage or burning does not seem to affect the incidence or severity

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Effect of planting date, seed treatment (cont.)

of eyespot (strawbreaker). For more information on wheat root rots, take-all and eyespot (strawbreaker), see OSU Extension Facts F-7622 or go to the web page for the Plant Disease and Insect Diagnostic Laboratory at: *http://www.ento.okstate.edu/ddd/hosts/wheat.htm.*

Seed treatments: There are several reasons to consider planting treated seed including:

1. Control of common bunt (also called stinking smut) and loose smut. The similarity of these names can be confusing. Both affect the grain of wheat, but whereas common bunt spores carryover on seed or in the soil, loose smut carries over in the seed. Seed treatments are highly effective in controlling both diseases. If common bunt was observed in a field and that field is to be planted again with wheat, then planting certified wheat seed treated with a fungicide effective against common bunt is strongly recommended. If either common bunt or loose smut was observed in a field, grain harvested from that field should not be used as seed the next year. However, if grain harvested from such a field is to be used as seed wheat, treatment of that seed at a high rate of a systemic or a systemic + contact seed treatment effective against common bunt and loose smut is strongly recommended. For more information on common bunt & loose smut, see: *http://www.entoplp.okstate.edu/ddd/hosts/wheat.htm,* consult the "2010 OSU Extension Agents' Handbook of Insect, Plant Disease, and Weed Control (OCES publication E-832)," and/or contact your County Extension Educator.

2. Enhance seedling emergence, stand establishment and forage production by suppressing root, crown and foot rots. This was discussed above under "Root and Foot Rots." Refer to Table 1 for a more detailed description.

3. Early season control of the aphid/BYDV complex and Hessian fly. This can be achieved by using a seed treatment containing an insecticide. Refer to Table 1 for a more detailed description of seed treatments with insecticidal activity.

4. Control fall foliar diseases including leaf rust and powdery mildew. Seed treatments are effective in controlling foliar diseases (especially leaf rust and powdery mildew) in the fall, which may reduce the inoculum level of these diseases in the spring. However, this control should be viewed as an added benefit and not necessarily as a sole reason to use a seed treatment.

5. Partial control of Hessian fly. This was also discussed previously, see Table 1.

Often a combination of chemicals is present in seed treatments, which can include a combination of fungicides for a broader spectrum of activity, or a combination of fungicides with an insecticide so activity against diseases and insects is achieved. Examples of this last type of compound include CruiserMaxx, Gaucho XT, and Rancona Crest, which contain an insecticide and fungicides so control and/or suppression of aphids (and hence BYDV), Hessian fly, wireworms, smuts and bunts, and seedling root rots is available in one treatment (Table 1). Other seed treatments such as Raxil MD, Dividend Extreme, Charter PB, and Charter F2 contain only fungicides, but can easily be mixed with an insecticide such as Gaucho 600 or Cruiser to obtain activity against bunts, smuts, seedling root rots and insects as well. Therefore again, I would emphasize that if a seed treatment is used, be sure to carefully read the label to ensure that the treatment is intended (and labeled) for your desired goal, and that it is applied at a rate labeled for the desired activity. For more information on seed treatments, their intended uses and rates consult the "2010 OSU Extension Agents' Handbook of Insect, Plant Disease, and Weed Control (OCES publication E-832)," and/or contact your County Extension Educator.

Table 1. Common Seed Treatments for Use against Wheat Diseases and Insect Pests

This information is provided only as a guide. It is the responsibility of the pesticide applicator by law to read and follow all current label directions. No endorsement is intended for products listed, nor is criticism meant for products not listed. NOTE: Many seed treatments have a required post-planting interval before grazing is allowed; check the label!

Product & (company)	Active ingredients	Rate (oz/cwt)	Activity against diseases/pests[A]				
			Ins/BYDV	Sm/Bu	RR	DO	FFol
CruiserMaxx (Syngenta)	thiamethoxam difenoconazole mefenoxam	5.0	A[B]	A	A	A	A
Cruiser 5FS (Syngenta)	thiamethoxam	0.75-1.33	A	NA[B]	NA	NA	NA
Dividend Extreme (Syngenta)	difenoconazole mefenoxam	1.0-4.0[C]	NA	A	A	A	A
Gaucho 600 (Bayer CropScience)	imidacloprid	0.8-2.4	A	NA	NA	NA	NA
Gaucho XT (Bayer CropScience)	imidacloprid metalaxyl tebuconazole	3.4	A	A	A	A	A
Raxil MD (Bayer CropScience)	tebuconazole metalaxyl	5.0-6.5	NA	A	A	A	A
Rancona Crest (Chemtura)	imidacloprid ipconazole metaxyl	5.0-8.33	A	A	A	A	A
The following alone or in various combinations (all are BASF products):							
Charter	triticonazole	3.1	NA	A	A	NA	A
Charter PB	triticonazole + thiram	5.5	NA	A	A	A	A
Charter F[2]	triticonazole + metalaxyl	5.4	NA	A	A	A	A
Stamina F3 HL	pyraclostrobin + triticonazole + metalaxyl	1.0	NA	A	A	A	A
Axcess	imidacloprid	0.8-2.4	A	NA	NA	NA	NA
Acquire	metalaxyl	0.1-0.375	NA	NA	A	NA	
Stamina	pyraclostrobin	0.4-0.8	NA	NA	A[D]	NA	NA

[A] Ins/BYDV=insects (aphids, Hessian fly, wireworms)/barley yellow dwarf virus; Sm/Bu=smuts/bunts; RR=root rots; DO=damping-off; FFol=fall (early season) foliar diseases.

[B] A=active (indicates a range of control from partial to complete – check label for details); NA=not active.

[C] Activities listed are for the 4 oz rate.

[D] Activity against root rots caused by *Rhizoctonia solani* and *Fusarium* spp.

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Upcoming Events

Kay County Soybean Tour

Sept. 3, 2010 Cori Woelk, OCES Ag Educator
580-362-3194
Tour begins at 9 a.m.

OSU Winter Crop School

Dec. 14-15, 2010 Wes Watkins Center - OSU Campus
Stillwater, Okla.