k-state extension AGRONOMY e-Updates

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1. Fertilizing fescue and bromegrass hay meadows and pastures

Much of the nitrogen (N) applied to tall fescue and smooth bromegrass hay meadows and pastures goes on in January or February in eastern Kansas. The amount and timing of N depends on whether the field is hayed or grazed; how much, if any N was applied in the fall; the price of N; and the growing conditions since last fall.

While January and February is normally the driest time of the year, there is still adequate moisture most years to move the N down into the root zone and stimulate early season growth of tall fescue and smooth bromegrass.

Actually, research has shown that in most of eastern Kansas, N applications in late November and December are just as effective as the January/February applications, and may actually result in slightly higher yields. The yield response comes from stimulating tillering before the grass goes dormant. However the trade-off may be slightly lower protein content and hay quality.

Hay

Normal N fertilization rates for established fescue and bromegrass hay fields are 90 to 120 pounds actual N per acre, or about 30 pounds of N per ton of expected yield. But with the volatile N fertilizer costs we've faced the last couple of years, and hay prices remaining fairly constant, many farmers are questioning how much, if any, N fertilizer should be applied to brome.

A recent summary of brome and fescue N response data shows that across nearly 100 experiments, the average yields for unfertilized plots was 1.35 tons of hay per acre, while maximum yields averaged 3.15 tons of hay with 140 pounds of N.

N Rate (lbs N/acre)	Hay Yield (tons dry matter/acre)	Hay Yield Increase From 20 pounds N (tons dry matter/acre)
0	1.35	-------
20	1.80	0.45
40	2.20	0.40
60	2.52	0.32
80	2.78	0.26
100	2.97	0.19
120	3.10	0.13
140	3.15	0.05
160	3.14	-0.01

Doing some simple cost-and-return calculations, using $60 per ton as the value of the hay produced and $0.45 to $0.50 per pound of N, the normal rates of N mentioned above (90 to 120 lbs/acre) are appropriate to maximize profit. It will be important to watch N costs, however, as they appear to be on the increase. If the cost of N were to rise to $0.55 per pound, the appropriate N rate to maximize profit would drop to between 80 and 100 lbs/acre. A year ago N prices were approaching $0.80 per pound, and in that case, economics suggested backing off to around 60 pounds of N/acre.

One issue these calculations don't consider is hay quality. Protein levels will be increased at the higher N fertilizer rates. So in cases where producers are relying on high-quality hay as their primary protein source, they may want to push N rates a little higher, or add supplemental protein to rations at the lower N rates.

Pasture

Under normal conditions, tall fescue and smooth bromegrass pastures that are grazed in the fall should receive about 40 lbs N per acre in late August or early September, along with any needed P and K. Producers should follow this up by applying another 60 to 70 lbs N per acre in January or February. If dry conditions in the fall limit growth and N utilization, there's a good chance some of that N will still be remaining, and producers can probably reduce spring rates by 10 to 20 pounds N per acre.

In any type of management program for tall fescue and smooth bromegrass pasture, for best results, needed phosphorus and potash should be applied in the late summer, along with a light application of N. Rates should be based on soil tests. Phosphorus will help the grass develop a good root system for the winter, and develop buds for new tillers the next spring. P and K applied in early spring won't provide the same benefits.

Other considerations

One nutrient producers should consider watching now for tall fescue and smooth bromegrass pastures is sulfur (S). At one time, fertilizers and air pollution provided a fair amount of S, but no longer. If the pasture is receiving adequate nutrients and precipitation, but is dropping off in

production, it could be deficient in S. Sulfur deficiency will cause a general reduction in forage production long before it results in visual deficiency symptoms. An application of S to a tall fescue or smooth bromegrass pasture that is deficient in S can result in forage yield increases of as much as 500 to 800 lbs per acre.

To determine whether P, K, S, and lime are needed on tall fescue and smooth bromegrass pastures or hayfields, producers should consider soil sampling. The best time to sample is 30 days prior to fertilizer application. Samples for a P and K soil test should be taken to a 6-inch depth. A profile N test to a depth of 24 inches should be used to evaluate S needs.

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2. Effects of early greenup in wheat

The unusually warm temperatures in late January and early February have caused wheat in much of Kansas to break dormancy and start greening up prematurely in central and eastern Kansas. The soils are too dry for greenup to have occurred in some areas, such as southwest Kansas, but that's not a good problem to have, either. This is a scenario reminiscent of 1989, which was a year with both drought and spring freeze injury. Hopefully we will avoid that this year!

Where the wheat is not drought-stressed, the crop has begun to grow as a result of several days of temperatures in the 60s and 70s and nighttime temperatures above freezing. It would be much better if temperatures were colder.

Plants growing at this time of year use valuable soil moisture. Where topsoil is dry, this puts added stress on wheat plants. Even where topsoil moisture is adequate, the moisture would be better used later in the growing season.

In addition, plants will have lost some of their winterhardiness. This won't be a problem if the weather never turns extremely cold again this winter or if temperatures cool down gradually, so the plants can regain some of their winterhardiness. If the wheat is green and growing, however, and temperatures suddenly go from unusually warm to extremely cold, either winterkill or spring greenup freeze injury could occur.

The warm weather could also result in early-season insect and disease problems. Army cutworms are sometimes a problem in wheat fields during February and March. Other early-spring insects to watch include winter grain mites and greenbugs. Early-season disease concerns include powdery mildew and tan spot, especially if moisture conditions improve.

Producers should watch their wheat crops for insects and diseases. Other than that, there's not much that producers can do to stop the development of the crop. The longer temperatures remain above normal, the more susceptible the wheat will be to a sudden temperature drop to the single digits or below.

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3. Soybean seed treatments in Kansas

Soybean seed is increasingly costly, which makes getting a good stand the first time more valuable than ever. Seed rot and seedling diseases can reduce germination, emergence, and seedling survival of soybeans.

Pythium, Phytophthora, Rhizoctonia, and *Fusarium* are soil-borne diseases that can infect soybean seed or seedlings. *Phomopsis* is a seed-borne disease.

Pythium and *Fusarium* are more prevalent in cooler soils, while *Phytophthora* and *Rhizoctonia* are more prevalent in warmer soils. Early in the season, *Pythium* is the more common problem in Kansas and later on *Rhizoctonia* becomes more important. *Fusarium* and *Phytophthora* are usually only problems in heavy clay soils and under irrigation. All of these fungi can cause seed rot and seedling diseases such as damping off. All four can result in death of soybean seedlings. Even if infected seedlings survive, yields may be reduced.

A good insurance policy for protecting stands and yields is to use a planting time fungicide seed treatment. K-State fungicide seed treatment evaluations have shown an average yield increase of 2.5 bushels per acre when a seed treatment was routinely used over the past six years.

Year	Untreated Bu/a	Treated Bu/a	Difference Bu/a
2003	25.3	28.4	+3.1
2004	53.9	58.0	+4.1
2005	38.4	38.7	+0.5
2006	24.8	27.2	+2.4
2007	37.9	38.0	+0.1
2008	47.8	52.8	+5.0

Locations: Scandia (irrigated), Ottawa, Parsons, Rossville, Silver Lake

K-State recommendations based on more than 20 years of field research are that all soybean seed planted before May 15 should be treated with a fungicide seed treatment. Where soybeans are being planted before May 15, it is especially beneficial to include products containing metalaxyl or mefenoxam for *Pythium* control. Additionally, no-till fields planted before May 31 should also be treated.

There are two basic types of fungicide seed treatments: protectants and systemics. The protectant products are effective only on the seed surface and have a shorter residual life (7 to 10 days). Systemic products are absorbed by the emerging seedling and translocated throughout the developing seedling and can provide protection for 14-21 days. Contact fungicides used for soybean seed treatment include: captan, PCNB, and thiram. Systemic fungicides used for soybean seed treatment include: azoxystrobin, carboxin, fludioxonil, mefanoxam, metalaxyl, thiabendazole, and trifloxystrobin.

Mefenoxam and metalaxyl are effective against *Pythium* and *Phytophthora*. These two chemicals are very closely related, and are marketed under trade names such as Apron XL and Allegiance. The other products mentioned above are effective against *Fusarium* and *Rhizoctonia*.

Since it is difficult to know or predict what seedling diseases may be a problem in any particular field, it is usually best to select a product(s) that will give a broad spectrum of disease control, somewhat similar to tank mixing herbicides.

Examples of products that have a combination of ingredients to provide broad-spectrum control include:

* Apron Maxx: mefenoxam, fludioxonil
* Bean Guard/Allegiance: captan, carboxin, metalaxyl
* Protector-L-Allegiance: thiram, metalaxyl
* SoyGard: azoxystrobin, metalaxyl
* Stiletto: carboxin, thiram, metalaxyl
* Trilex Flowable / Trilex 2000: trifloxystrobin, metalaxyl
* Warden RTA: mefenoxam, fludioxonil

Seed treatments can either be applied commercially or as a hopper-box or planter-box treatment. The product label will specify how they are to be applied. The benefits of commercially applied seed treatments are they are cheaper and the seed is more uniformly covered. One of the most important factors in getting good results from seed treatments is to make sure to get good seed coverage. The negative is that companies will generally not take back treated seed if for some reason it does not get planted.

Growers who have not taken delivery of their seed may still be able to get it custom applied by their seed dealer. If seed has already been received, there is still the availability of on-farm applied, “hopper-box” treatments. In selecting a hopper-box seed treatment, it is best to use one of the newer generation systemic products rather than a contact material alone such as captan. Hopper box formulations have the advantage of treating only what you will plant, but they are more expensive and coverage on the seed may not be as good as it should be.

If a rhizobial inoculant is to be used, check the product label for compatibility and specific instructions on usage. Not all seed treatment fungicides are compatible, particularly some of the older materials.

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4. Late winter/early spring control of cheatgrasses in wheat

There is still time to apply herbicides this winter to control infestations of cheat, Japanese brome, or downy brome. It’s generally easier to control these grasses in the fall, but herbicides can also be effective in late winter/early spring, especially for control of cheat and Japanese brome.

K-State tests have shown that the most effective herbicides for late winter/early spring control of cheatgrasses are Olympus, Olympus Flex, and PowerFlex. On Clearfield varieties, producers can use Beyond.

Producers can generally expect a very high level of control of cheat and Japanese brome with any of those herbicides, unless ALS resistant populations have developed. Several fields with ALS resistant cheatgrass have been confirmed in central Kansas in wheat fields that have been treated repeatedly with these herbicides over the years.

Downy brome generally is more difficult to control than cheat or Japanese brome. Olympus, Olympus Flex, PowerFlex, and Beyond will typically provide about 70 percent control of downy brome when applied late winter/early spring, depending on development stage of the downy brome.

For best results, these herbicides should be applied as soon as the wheat starts to green up and with mild temperatures. When cheatgrasses are fully tillered, they are more difficult to control. By the time wheat is jointing, it is too late to apply these herbicides.

Producers should always add a surfactant with Olympus, Olympus Flex, PowerFlex, or Beyond. These products can be applied with liquid nitrogen carrier, but only up to 50% of the total spray carrier and at a maximum of 30 lb N per acre. When applied with nitrogen fertilizer carrier, the surfactant rate is limited to 1 quart per 100 gallons of spray solution. Some leaf burn can be expected with topdress applications, but yields have not been impacted unless applied too late.

These herbicides will also provide residual control of winter annual broadleaf weeds, except for ALS-resistant weed populations.

If Italian ryegrass is a problem, Olympus Flex, PowerFlex, or Beyond (Clearfield wheat only) would be the most effective options.

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5. New Southwest Area Crops and Soils Specialist

Kent Martin is the new Southwest Area Extension Crops and Soils Specialist as of January, 2009. Kent is based in the Southeast Area Extension office in Garden City.

He is native of Woods County, Oklahoma. That is in the northwest part of the state (Alva is the county seat, for those of you who know the general area). Kent got his B.S. in Plant and Soil Sciences, Agronomy option, at Oklahoma State University. He then received his M.S., Soil Fertility option at OSU. He did his master's research on remote sensing and soil fertility.

He received his Ph.D. in Agronomy at K-State, working under Dave Mengel. His Ph.D. research at K-State focused on phosphorus placement in reduced tillage systems. He was also manager of the Soil Testing Laboratory at K-State from March 2006 through January 2009.

Kent’s office phone number in Garden City is 620-275-9164. His email address is kentlm@ksu.edu.

-- Steve Watson, Agronomy e-Update Editor
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These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Steve Watson, 785-532-7105 swatson@ksu.edu, or Jim Shroyer, Research and Extension Crop Production Specialist and State Extension Agronomy Leader 785-532-0397 jshroyer@ksu.edu