K-STATE Research and Extension

Seed Production Management for Smooth Bromegrass and Tall Fescue

Department of Agronomy | MF924 | Crop Production

Seed production from tall fescue and smooth bromegrass are alternative crops for most producers in Kansas because the stands are primarily used for grazing and hay. This dual use maximizes the total crop, even though seed yields are low. Highest seed yields are produced from cultivated rows, but a solid stand is important for forage and erosion control. These cool-season grasses are most productive when grown on deep, fertile soils with high water-holding capacity.

Two management practices are especially important in producing high seed yields:

- Clipping and removing the forage soon after the seed stalks are mature.
- Applying nitrogen during late fall or early winter.

Stubble Management

Stubble should be clipped to a height of 3 to 4 inches as soon as possible after seed harvest to allow light to stimulate tiller initiation at ground level. Because bromegrass has fewer basal leaves, clip it no shorter than 4 inches high.

During the fall and early winter, tillers develop the number of heads available for the following year's seed crop. Light and temperature relationships resulting from timely clipping encourage a high percentage of early, vigorous, productive heads. The most effective tillers will be initiated by September 1.

Failure to clip the stubble may reduce the next seed crop of tall fescue by as much as 30 percent (Sandage, 1998). Straw and stubble removal also increases the seed yield of smooth brome (Canode and Law, 1978). Hay salvaged after seed harvest is high in fiber, but basal leaves make it of some value, comparable to prairie hay. Burning stubble has been suggested, but seasonably hot, dry soil conditions endanger survival of the stand and make fire control difficult.

If a forage field is intended for seed next year, clipping should be done by the time the seed stalks are normally mature. If hay was cut early for quality, regrowth should be removed by early July. Complete removal of the residue from the field allows maximum tiller development.

Fall growth should be grazed only moderately until the growing season is over. Excess trampling is undesirable.

Fertilization

Proper nitrogen fertilization is primarily responsible for how well the seed heads fill. Tiller bud formation does not require much nitrogen. If used only for seed, fescue should be top-dressed with 70 to 100 pounds of nitrogen during December or January. With good moisture, bromegrass will use similar rates.

Timing of nitrogen application affects seed yield. Nitrogen applied in August or September may be metabolized by fall growth and/or lost. Nitrogen applied in late winter (often as early as February 1 in southern Kansas) may cause excessive vegetative growth. If lodging occurs, seed growth will be limited, resulting in lower yield and quality and a difficult harvest. Only if no nitrogen was applied in August or September should late winter application be used, and then with a limited rate of application. In contrast, for forage production alone, the late-February, early-March application period can be effective.

Determining the economical amount of nitrogen for a seed crop is often complicated if nitrogen was applied in late summer to encourage forage growth for winter grazing. Some additional nitrogen should be applied in December or January for seed production. The amount depends on how much was applied earlier. Increase the application in cases of vigorous vegetative growth, intense grazing, little clover present, rainfall filling the subsoil before freezing, etc. A rule of thumb is that after applying 50 to 60 pounds in the fall, use 40 to 60 pounds in the winter; if 80 to 100 pounds was applied in the fall, an additional 30 to 40 pounds may be sufficient. The larger total amount is needed to offset forage removal and other nitrogen losses. Bromegrass, especially older stands, requires the heavier rates.

Mineral Nutrition

Phosphorus and potassium should be applied according to soil test recommendations. On pure grass stands, the pH level should be maintained above 6.0. Nitrogen fertilization increases the need for lime. On grass-legume mixtures, strive for a pH of 6.5. This higher pH will benefit and lengthen life of legumes growing with the cool-season grasses.

Grazing

Because most seed fields are grazed during the fall or winter, cattle management becomes an important factor in seed production. Grazing should be moderate during August, September, and October. During this time, energy is stored and tillers are initiated for next year's seed heads. Graze bromegrass no shorter than 6 inches. Fescue has more basal leaves but also should not be grazed shorter than 6 inches.

After November 1, grazing may be increased to remove all usable forage by January 15. Fescue is often stockpiled for use after November 1. Cattle should be removed from seed fields before any of the potential seed heads can be grazed off elongating tillers. This may be as early as March 15 in southern Kansas and April 1 in northern Kansas.

Maintenance

Seed yield will usually decline after a stand is 3 or 4 years old; however, a properly fertilized and managed grass stand can produce 400 to 500 pounds of seed per acre indefinitely. Solid stands of tall fescue are sometimes "skim" plowed to a depth of 3 or 4 inches after fertilization to thin and increase the vigor of the stand and encourage better seed production. This option could incorporate lime and phosphate deeper into the soil. Renovation and interseeding legumes may be effective in supplying part of the needed nitrogen and in maintaining a more vigorous grass stand.

Weeds/Pests

Quackgrass and annual brome lower seed quality and should be removed before harvest. They cannot be adequately removed by seed cleaning. Johnsongrass, musk thistle, and sericea lespedeza also may invade. The county weed department can be helpful in controlling noxious weed infestations and thus support the effort to produce high-quality, weed-free seed. Maintaining good soil fertility also will reduce problems with weed invasions if a good stand is established.

Stem rust can be a problem in tall fescue, but many problems, such as nematodes and foliage-feeding insects, are reduced by endophyte presence. Grubs are the main insect problem in smooth brome. The larvae feed on the roots and rhizomes. Damage and recovery are worse in dry years. Fungicides could be used in seed production fields, but they cost too much to apply in pastures.

Harvesting

Seed may be harvested by direct combining or windrowing and then combining. Windrowing saves the most seed, but most bromegrass growers in northeast Kansas direct combine.

The seed shatters easily when ripe. Delays caused by rains, unavailability of a combine, or high winds can easily reduce yields by 50 percent or more. Even under favorable conditions, extreme care and skill are necessary to prevent serious losses.

If the seed can be harvested in 1 to 2 days, direct combining is feasible. Combining should begin when 85 to 95 percent of the seed is mature. Many late heads will still be immature at this time. A few seeds will shatter when the ripe stalk is tapped just below the head. Harvesting with more than 20 percent immature seed usually results in reduced yields. At harvest, seed moisture should be about 40% in the standing crop.

To avoid delays and reduce risks of shattering on large acreages, the seed may be dried in a windrow and collected with a combine attachment. For best results, use a swather with a canvas gathering platform to give the gentlest movement possible. Swathing should begin when the straw in the head is yellowing. At this stage, only an occasional seed will shatter from the earliest maturing heads. The swather should cut high enough to leave the windrow on top of the stubble. Air will circulate through it and decrease drying time. Windrows should be combined as soon as they are thoroughly dry.

The combine may first be set according to the manufacturer's manual. Aggressive cylinder action is not necessary. Chaff should be examined for seed from time to time as harvest proceeds. The glumes readily break free, but because they are similar in color and only slightly longer than the seed, it appears that seed is being blown out. If the distinction is difficult, separate the glumes and seed from an unthrashed head by hand. On an underlighted glass, the seed will stand out as a dark silhouette among the translucent glumes.

Seed Handling

Heating in new seed is nearly always a problem. Cleaning the seed immediately can remove green, wet material, but the seed still needs special attention. Excessive seed moisture causes heating in storage, which results in reduced seed vigor and germination. If the seed amount is small, it may be spread out to dry in bins, lofts, etc. If the seed begins to heat, it must be promptly stirred or turned to cool. To avoid loss of germination and vigor, seed temperatures must not exceed 110 degrees Fahrenheit. In drying bins, the circulating air at the flue entrance should not exceed 90 degrees Fahrenheit so that no hot spots exceed the 110 degrees Fahrenheit limit.

Larger amounts of seed may be dried in well-drained curing yards. The seed is placed in windrows and turned with a tractor blade. Frequent turning prevents heating and facilitates drying. The seed can withstand surprisingly large amounts of rain without damage.

Marketing

Consult seed dealers or buyers before harvest. They may suggest procedures about timing and handling that will help save seed and improve quality. Their counsel may be valuable in pricing, which is traditionally extremely volatile.

With tall fescue, there may be a demand for endophyte fungus-free seed, which may be from tested native stands. Long-term storage (more than 1 year) helps destroy the fungus without serious seed deterioration.

Longer-term market planning may raise interest in novel endophyte tall fescue varieties, certified seed, or continued effort with "wild" or common seed from present stands. Old pasture varieties such at KY-31 are still used for turf. Current trends emphasize fine-leafed strains and blends of tall fescue for turf.

References

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