

TEFF: WHAT IS IT? WHERE DOES IT FIT IN KENTUCKY

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Teff (*Eragrostis tef* (zucc)) is an annual, warm season grass native to Ethiopia. Throughout its history, teff has been used more as a gluten-free grain for flour than as forage. However, in recent years, forage agronomists and producers have become increasingly interested in its potential contribution as a hay crop. Teff is characterized by a fairly large crown, many tillers, fine stems, a very shallow root system, rapid growth and high tonnage capability. During the vegetative stage, teff plants look somewhat similar to tall fescue in size and color. Teff tends to germinate quickly with good moisture, regrow quickly after being cut and a combination of timely planting, good soil fertility and favorable summer rainfall may allow for three to four harvests before the onset of cold temperatures kills the stand in the fall.

Though teff's annual nature requires that it be reseeded each growing season, it potentially can be integrated into Kentucky forage programs in a variety of ways. Some possibilities include using it as:

- Stand alone grass hay crop for commercial sales or on-farm use
- Emergency hay or haylage crop that can be planted in mid-summer
- Rotational hay crop that can be planted after cereals or annual ryegrass are harvested
- Break crop when renovating a perennial grass or alfalfa stand
- Grass component planted into a thinning alfalfa stand

Successful teff production hinges on good agronomic management, starting with proper seedbed preparation. Excellent stands can be achieved using either no-till or conventional seeding methods. However, what we've learned from on-farm evaluations over the past three years suggests that broadcasting teff seed into a firm, prepared seedbed may be the best option in field environments where tillage is environmentally acceptable. Most producers in the Ohio Valley region who've tried teff have done well in getting it established. However, situations have occurred where the crop was slow to emerge or failed to emerge altogether. In most cases, those problems stemmed from planting into seedbeds that were too loose or getting the seed placed too deep. The importance of a "firm" seedbed cannot be overemphasized. Since teff seed is extremely small, it should be planted at a depth of only ¼ inch or less. Not only is a very firm seedbed critical for maintaining good seed to soil contact, consistently

maintaining such a shallow depth with a no-till or conventional box drill can be very difficult if soil conditions are too loose and fluffy. Not only is seedbed firmness essential when teff is to be drilled, it's just as crucial when broadcasting seed on the surface and cultipacking it into the soil.

Relatively warm soil temperatures are necessary to promote rapid teff seed germination and seedling emergence. Therefore, seeding should not be made until the soil temperature has consistently reached 64 degrees F, which in Kentucky generally occurs sometime in early to mid May. The recommended teff seeding rate is generally 5 to 6 lb/acre when using uncoated seed. However, most teff seed currently on the market is coated, which needs to be planted at a higher rate of 8 to 12 lbs/acre.

As with any forage species, good fertility practices can mean the difference between producing a mediocre teff crop or a high yielding one. Little research has been done yet to precisely quantify teff's nutrient requirements. Until more information is forthcoming in that regard, we are recommending that teff be fertilized with phosphorus and potassium at rates comparable to other forage grasses grown in the region. As for teff's nitrogen needs, we recommend split applying a total of 100 lb/acre actual N during the season. Put the first 50 pounds on at planting and then apply the remaining N after the first or second harvest

One of Teff's morphological characteristics is its very fine stems. While that's probably a benefit with respect to forage quality and palatability, the fine-stemmed nature of the crop can also cause lodging problems if the grass is not harvested at the proper maturity stage. Severe lodging not only makes harvest more difficult, but appears to also occasionally cause the plants to suffocate. To avoid or at least minimize that threat, teff should be harvested in the late vegetative stage, just prior to seed head emergence.

Teff's maximum yield potential and quality expectations in the Ohio Valley region are not yet completely known. Two harvests per year have been relatively commonplace and several of our more management intensive producers have reported three to four harvests per year, which matches reports in other parts of the U.S. We have seen individual teff cuttings in Kentucky and some other parts of the country yield as much as 2 to 2.5 tons of dry matter (DM) per acre. However, single harvests of approximately 1.5 tons DM/acre are probably more typical, with total yields for the growing season ranging from 4 to 6 tons DM/acre. It's noteworthy that teff yields on many Kentucky farms in 2008 were somewhat disappointing when compared to 2007. In contrast to the higher numbers referenced above, some producers reported per cutting yields of just 0.75 to 1 ton DM/acre during 2008. Many of the same producers also observed that crude protein levels in teff hay samples were somewhat lower in 2008 than they were in 2007, when good CP values in the 15-16% range were common. The lower

yields and protein levels associated with the 2008 crop can likely be attributed to drought or near-drought conditions that persisted in many parts of Kentucky during the latter half of summer and into early fall. Though teff's Ethiopian roots suggest it to be fairly drought tolerant, it still requires a reasonable amount of rainfall to produce top yields and quality.

Several livestock producers have naturally inquired about teff's potential as a grazing crop. Although there have been a few reports of grazing teff throughout the country, our initial results indicate that grazing is not a good, productive way to utilize this forage species. The main roadblock to teff's suitability as a grazing crop is its very shallow root system. Grazing animals are likely to pull substantial numbers of teff plants out of the ground as they feed on it, which can quickly damage the stand and its overall yield potential. If a producer is insistent on pasturing teff, it's strongly advised that they at least wait until one or two hay cuttings have been harvested from the field before animals are turned out on it. That will allow roots more time to develop and perhaps become more deeply anchored in the soil profile.

In summary, teff certainly isn't a "silver bullet" forage species...none are! However, at this point teff certainly appears to have a legitimate place in our forage systems as a hay crop. It produces or has the potential to produce very good yields and quality. In particular, it is rapidly gaining popularity among the horse industry as a very desirable hay. Though it remains relatively new on the Kentucky forage scene, I believe we will see teff usage and interest continue to grow.