

## **TEFF: Old Plant – New Use**

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Teff: What is it? Where did it come from? Why haven't I heard of this before? Is it a new replacement for Tall Fescue? Will it grow on my farm? Do horses really love it? Does it grow without water and fertilizer? These and a host of other questions concerning Teff establishment, production, harvesting and management have been asked in some form at forage meetings this winter. I wish I could say I have three years of replicated data from several locations across Kentucky. We do not have a lot of data from Kentucky or any other state on Teff; however, several studies are planned for 2008. We actually had several studies planned for 2007 and some were seeded but with the drought very little useful data was obtained. The following represents the best of my thinking to date. I have visited with several who have grown Teff including Dr. Tim Phillips, UK Grass Breeder and Mr. Bob Jaynes, Farm Manager at WKU who have more experience than anyone in Kentucky. I have also visited with Bret Winsett from Miles Farm Supply and Joe Stephens from Turner Seed who have sold Teff seed for the past two years and worked with several farmers using it.

**What is it?** Teff, also referred to as Summer Lovegrass (*Eragrostis tef*), is a warm season annual grass native to Ethiopia and has been used in many countries (Africa, India, Australia and South America) as a grain crop for years. The flour is primarily used to make fermented sourdough-type flatbread called Injera. It is also eaten as porridge and used as an ingredient of homemade alcoholic drinks in Ethiopia. It is a five-stem, leafy grass with a shallow root system. It was first grown in this country as a forage crop in Oregon in 2003. My first observation of this

crop was in 2005 in Oregon. The first plantings I am aware of in Kentucky was in 2006. The seed are extremely small with each pound containing approximately 1.3 million seeds.

**Adaptability in Kentucky:** Over the last two years, I have seen Teff in stands in many locations across Kentucky. It is VERY sensitive to frost and will not tolerate freezing temperatures. I have not seen any disease or insect problems so far. Weeds were a problem last year in some seedings made during extremely dry conditions. Broadleaf weeds can be controlled; however, warm season annual grass weeds are usually the biggest problem and one for which we have no herbicide options for taking them out of Teff.

**Varieties:** We do not have any variety data in Kentucky. We will seed new studies this year. There are several varieties on the market including: Tiffany, Excalibur, Dessie, Corvallis, and Pharaoh. There may be others but these are all I am aware of today. I grew both Tiffany and Dessie at Princeton last year. We should have data at the end of the growing season. Seed are available, both raw and coated, of several of these varieties. Seed prices quoted to me this week were approximately \$3.50/lb.

**Establishment:** Since Teff is very frost sensitive, it should not be seeded until after the last threat of frost and after soil temperatures have reached 55-60°F. This usually means starting seeding around mid-May. It can be seeded into July, but late seedings will reduce yield and number of cuttings. Some have seeded in April but stands were usually not as good with the earlier seeding. Seeding rates vary from 4-6 lbs/acre for raw to 8-10 for coated. Since seeds are so small, seeding depth is critical ( $\frac{3}{8}$  –  $\frac{1}{4}$  inch and not over  $\frac{1}{2}$ ). Best results are usually observed when seeding on a firm, well-prepared seedbed using a Brillion seeder or cultipack-seed-cultipack. No-till has been used but is a bigger challenge to adjust for seeding small seed

and controlling depth. Coated seed are larger and usually easier to seed. Soil test to determine P & K. Apply P & K similar to perennial cool-season grasses like orchardgrass. Nitrogen at rates of 30-50 pounds per acre are suggested at seeding. High rates of nitrogen increase lodging which can be a major problem with this grass. If the higher rate is used at establishment, no additional nitrogen would likely be needed following first harvest. To reduce the lodging, a lower rate, 20-30, could be applied at seeding followed by an additional 30-40 after first and second harvest.

**Harvesting:** Since Teff has a tendency to lodge as seedhead formation begins, I suggest it be harvested for hay or silage in the late-vegetative or very early head stage. With adequate growing conditions, this will occur approximately 45-50 days (much longer during drought of 2007) after seeding with 40-45 days between cuttings. Seedings made in mid-May can normally be cut 3 times, some have gotten 4. Yield per acre has ranged from 3.5 to over 6 tons per acre. It is fine stem – leafy and usually dries much quick and has better quality than sorghum-sudan hybrids; however, yields are often only half of sorghum-sudan hybrids.

**Quality:** Quality of Teff, like all other forage plants, varies with stage of maturity. With all the analysis I saw last year, crude protein averaged 12-16%. We sampled plants of two varieties at Princeton at 8 and 32 inches. The very young leafy sample was over 20% crude protein.

**Use:** I consider its dominant use as hay but can be used as silage. I have reservations about Teff as a grazing crop. With the very shallow – fine root system, plants are very easy to pull up. I would not recommend grazing the first cutting regardless of how it was seeded. Once the plants have established and have a good root system and are anchored, it can be grazed;

however, damage can occur. I have seen cattle pull plants out of the ground in September. I have seen damage to stands just from harvest equipment. One farmer indicated “It likes the heat, but hates the traffic.”

Teff is a, warm-season forage grass. We still have a lot to learn about this plant, but I do believe it has potential as another “tool” in our forage production toolbox. It is a fine-stem, leafy plant that makes nice hay. It is usually better quality than our traditional warm-season annual crops (millet, sorghum-sudan hybrids) but will not yield as much. The small seed and sensitivity to frost requires patience and management during establishment. We will have more information on this grass following studies planned for this growing season.



**Teff hay curing on the WKU Farm in Bowling Green.**



**Lodging can be a problem with Teff. (Plots at the UKREC in Princeton Summer 2007)**