

Birdsfoot Trefoil

Last week, we had an interesting irrigated farm field day at the USU Greenville Research Farm in North Logan. Activities included discussions on vegetable varieties, seeding rates with “Roundup Ready” alfalfa, an examination of the irrigated safflower variety plots, dialogue on wheat breeding and inspection of birdsfoot trefoil plots. The purpose of this article is to inform the reader of some unique characteristics of birdsfoot trefoil (*Lotus corniculatus* L.).

Birdsfoot trefoil is a perennial forage legume with distinct characteristics making it very useful in grazing systems---the major benefit being that, unlike alfalfa, it does not cause livestock to bloat. The plant can annually reseed itself, fix nitrogen from the atmosphere, is not affected by alfalfa weevil and produces relatively well on poorly drained, marginal soils. Birdsfoot trefoil will tolerate short periods of flooding and produces stems that are smaller in diameter. Newer varieties are also suitable for hay production, though birdsfoot trefoil will not out yield alfalfa when raised on fertile, well-drained soils. Loss of quality with maturity is less pronounced with trefoil than alfalfa, a real advantage when weather or work hinder a farmer’s ability to harvest at the proper time.

One of the major disadvantages of birdsfoot trefoil is slow establishment. Small seed size and poor seedling vigor requires careful management for successful establishment. Firming the soil in the seedbed before and after planting will ensure good soil-to-seed contact and improve moisture uptake to enhance germination and emergence. Trefoil seed should also be inoculated with an appropriate *Rhizobium* bacterium to ensure sufficient nodulation of the root system and adequate atmospheric nitrogen fixation. Seeding rates of 8 to 10 pounds per acre are considered adequate under normal conditions. After the seeding year, trefoil stands can be long lived because of the natural seeding that occurs each year within the canopy. Trefoil plants, as compared to alfalfa, are less drought tolerant with perhaps lower winter hardiness because of more shallow roots. Norcen is a variety that has over wintered and performed well in Cache Valley. Though individual trefoil plants will not survive as long as alfalfa, a properly managed stand will live longer because of trefoils ability to reseed itself.

Grazing studies in Kansas showed trefoil plants withstanding grazing pressure better than other legumes, with the exception of white clover. Trefoil’s prostrate growth habit reduced its risk of total defoliation though it appeared to be more sensitive to fall grazing than alfalfa because it stores fewer carbohydrates for winter. Daily gains for cattle were as much as 30% higher when trefoil was introduced into straight grass stands and birdsfoot trefoil in grass provided nitrogen credits equal to 80 pounds per acre. The eastern Kansas study showed trefoil annually producing 1.5 to 5 tons of dry matter per acre.

Dr. Tom Griggs explained that our Utah study complements current trials at Michigan, West Virginia and Wisconsin where 14 trefoil cultivars are being evaluated for a variety of characteristics, including tannins. He also shared a handout explaining that trefoil contains condensed tannins at approximately 0.5 to over 4% of herbage dry weight, as

compared to condensed tannin levels in alfalfa and red and white clovers at approximately 0.2%. Condensed tannins impact both ruminant nutrition and environmental quality because they can react with forage proteins to form tannin-protein complexes that reduce the breakdown of protein to ammonia in the rumen (pH 6.0-7.0) but can release protein under acidic conditions in the abomasum (pH 2.5-3.5). This protective effect can lead to increased absorption of amino acids from the small intestine (bypass protein), reduce urinary excretion of N to the environment and increase the efficiency of protein utilization by ruminant animals. Increased protein utilization translates into enhanced animal performance, be that weight gain or increased milk production.

Websites that may be of interest to readers include:

<http://pubs.cas.psu.edu/Freepubs/pdfs/uc087.pdf>

<http://s142412519.onlinehome.us/uw/pdfs/NCR474.pdf>

<http://deercreekseed.com/index.html>