The breeding program on forage legumes at Auburn University has focused mainly on breeding and utilization of sunn hemp (Crotalaria juncea L.) and utilization of sericea lespedeza [Lespedeza cuneata (Dumont de Coursset) G. Don] in recent years. In addition to those two species, breeding on vetches (Vicia spp), crimson clover (Trifolium incarnatum L.), red clover (Trifolium pratense L.), and white clover (Trifolium repens L.) is being conducted. Sunn hemp has as base chromosome number (n) 8, it belongs to the Family Fabaceae, Tribe Crotalarieae. It is a fast growing species that is a widely grown green manure in the tropics, where is also grown as a fiber and animal fodder crop (Purseglove 1981). It is a legume adapted to a wide range of environmental conditions and soil types. Furthermore, it tolerates droughts and can grow in low fertility soils. Sunn hemp produces high biomass yields, fixes N and is resistant to several nematodes (McSorley 1999).

Measurements of neutral detergent fiber (NDF) and acid detergent fiber (ADF) of sunn hemp leaves indicate that their forage quality is acceptable for lactating cows. NDF values of leaves 6 to 12 WAP ranged between 244 to 373 g kg\textsuperscript{-1} and ADF values ranged between 189 and 289 g kg\textsuperscript{-1}. Stems were not found to be suitable for feeding lactating cows. NDF values of stems 6 to 12 WAP ranged from 660 to 783 g kg\textsuperscript{-1} and ADF values ranged from 543 to 653 g kg\textsuperscript{-1} (Mansoer et al. 1997).

Plants flower commonly late in the Fall in response to short days. In the southeast, mild Falls allow plants to set a few pods but the seeds are not fully developed by the time plants are killed by a frost. Consequently, no seed production has taken place with exception of small scale operations in South Texas (Cook and White, 1996). However, the possibility of an early frost with the subsequent reduction in seed yield limits seed production in the continental USA. Shortage of inexpensive seed has prevented sunn hemp from being a commonly grown crop. There is the need to make sunn hemp a more cost effective crop by developing a cultivar that can produce seed in our area. A breeding program aimed at developing cultivars selected to produce seed under the climatic conditions of Alabama has been conducted at Auburn University. A locally selected cultivar grows less, therefore has lower biomass yield but it has the added value of producing seed.

It has been reported that sunn hemp seeds contain five pyrrolizidine alkaloids. Pyrrolizidine alkaloids ingested in sufficient amount can be toxic to animals and birds. Research at Auburn in cooperation with other institutions has shown that trichodesmine and juncene were the only pyrrolizidine alkaloids present in the seeds of nine populations that originated in different parts of the world (Ji et al. 2005). Furthermore, seed of the breeding population has been fed to broiler chicken to determine it effects on the birds. Seeds fed at a contaminant or an ingredient level did not affect bird mortality (Hess et al. 2006).
Sericea lespedeza (SL) is a long-lived species well adapted to most of the southeastern U.S. that can provide much needed forage during the summer in the Southeast region. Up to now, the main use of this plant has been in soil conservation and soil mine reclamation because it builds organic matter in the soil (Kalburtji et al. 1999). Recent research has indicated SL forage can control gastrointestinal parasites (GIP) in small ruminants.

Infection with gastrointestinal parasites (GIP), particularly *Haemonchus contortus*, is a major limiting factor to economic small ruminant production in the southern USA. Recent reports (Mortensen et al. 2003) indicate that anthelmintic resistance in goats has become highly prevalent in the southern USA. Grazing forages high in tannins has been shown to reduce numbers of parasite eggs in sheep and goat feces in a number of studies (Athanasiadou et al. 2000, Min et al. 2004).

Research on the effect of SL forage on GIP in goats (Min et al. 2004) has shown that animal grazing on SL alone or grazing on SL alternating every 2 weeks with fescue-crabgrass reduced total fecal egg output based on fecal egg counts (FEC, parasite eggs per gram of feces) and fecal output, rate of larva development (larvae per 10g of feces), and animal worm burden compared to those animals grazing on crabgrass alone.

The anthelmintic potential of SL hay (cultivar AU Grazer) has also been investigated. SL hay was evaluated by feeding goats either SL or bermudagrass (BG) hay diets. Feeding SL hay to goats reduced parasite FEC and increased packed cell volume (PCV) compared with BG hay (Shaik et al. 2004, 2006). Furthermore, SL hay reduced numbers of both abomasal (*Hemonchus contortus*, *Ostertagia circumcinta*) and small intestinal (*Trichostrongylus colubriformis*) nematodes compared with goats fed BG hay and a lower percentage of ova in feces from SL-fed goats developed into infective (L3) larvae (Shaik et al. 2006). Additional work by Dykes et al. (2006) confirmed the effects of SL on goats. Similar work has been conducted with sheep where FEC were reduced up to 98% (Lange et al. 2005). Thus, SL hay could reduce pasture contamination from GIP larvae and could be replace pharmaceutical anthelmintics. These results indicate that SL has a great potential use in organic agriculture.

Literature Cited


