

WHEAT AND GRAIN PROJECT REPORT 2005 REPORT

Title: Development of a Seed-producing Sunn Hemp Cultivar for Alabama

Investigators: Jorge A. Mosjidis, Dept. Agronomy and Soils; Paul L. Mask, Dept. Agronomy and Soils; D.Wayne Reeves, USDA-ARS, Athens, GA.

Objectives: To screen sunn hemp germplasm for ability to produce seed and to select plants capable of producing seed in Alabama while maintaining good agronomic characteristics

Research plan:

1. Plant selection blocks with several thousand plants where the plants with best agronomic traits that can produce seed will be selected..
2. Establish isolation plots for seed increase of selected populations that have good potential based on field observations.
3. Study the effect of sunn hemp seed inclusion in broiler starter diets on live performance attributes.

Results:

Two large breeding blocks were planted in early June 2005 with seed from plants selected in previous years for ability to produced good quality seed in Alabama, shorter plants and early maturity. Plant growth in 2005 indicated that there has been substantial progress made when selecting in previous years. One block was planted in a Compass soil (coarse loamy, lower available water holding capacity, some plinthite may cause some restricted soil volume, prone to compaction) at the Field Crop Unit (FCU) in Shorter and the other was planted in a Wickham soil (better fertility and higher available water holding capacity) at the Plant Breeding Unit (PBU). About 600 plants were selected and individually harvested from the FCU. Strong winds created by the path of hurricane Denise broke the stems of nearly 50% of the main crossing block at PBU. Of the surviving plants, over 400 were selected and individually harvested .

A research was conducted to analyze and quantify sunn hemp seeds for several of the toxins that have been reported in seeds of plants that belong to the genus *Crotalaria* such as showy crotalaria (a weed poisonous to chicken). Those toxins are called pyrrolizidine alkaloids. We determined in cooperation with scientists from Auburn University and Univ. of Mississippi that the toxins in our material and in the US cultivar Tropic Sun were very low, they had only a small fraction of what is found in showy crotalaria. Therefore, seeds of sunnhemp were considered to be non-toxic to chickens. Another study was conducted in cooperation with Dr. J. Hess from the Poultry Dept. to determine if indeed the seeds were not toxic to chickens. Whole seeds of the population being bred for Alabama were included in the chicken's starter feed at three levels, namely, 0% control, 0.5% contaminant level and 5.0% feed ingredient level. Results indicated that for 21-day-old broiler percent mortality was the same for the control and the two feeding levels that included sunnhemp seed, however, body weight (control 850 g, 858 g for 0.5% and 801 g for 5%) and body weight gains were not affected by 0.5% contaminant level but were

reduced by the 5% feed ingredient level. In conclusion, whole sunnhemp seeds were not toxic to chickens but it is not advisable to feed them to chickens because of reduced weight gains. Further research is needed with chicken using ground sunnhemp seed.