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U.S. Department of
Agriculture
National Institute of
Food & Agriculture



Project Title: ***Development of Safflower as a New Biomass Energy Crop for the Lower Great Plains of North America***

DR. DICK AULD

Project Goal

This project investigates on how to successfully introduce a frost-seeded safflower crop that is well adapted to the Lower Great Plains (LGP) region to ensure sustainable biodiesel production. The specific objectives are: 1) Genetic enhancement of cold tolerant safflower lines for increased oil content, 2) Agronomic research on planting date, irrigation management, fertility and harvesting guidelines for production of cold tolerant safflower, and 3) Extension/Outreach to deliver the production guidelines to growers and processors in this region.

Project Outcomes

- Significant differences in irrigation response were not detected in cultivars, irrigation rates, or the interaction of cultivars and irrigation rates.
- The elite lines had seed yield which ranged from 985 to 1712 kg/ha in 2012 and from 2290 to 2838 kg/ ha in 2013 .
- Six spring genotypes were evaluated at 0, 15, 30, and 45 kg ha⁻¹N/ acre under drip irrigation to determine the optimum fertility management of short season safflower grown as a cover crop. Seed yield of the 4 rates of N fertilizer were not statistically different ranging from 1,330 to 1,484 kg ha⁻¹.
- 71 unique hybrid combinations which combine high seed yield potential with high oil content and high oleic acid composition were made. These populations will provide valuable germplasm resources for many years. The F1 generation of these crosses are currently being increased in the greenhouse at Texas Tech University to supply F2 populations for future research.
- Safflower responds to irrigation water linearly. The number of seeds not seed weight seems to drive the yield formation. Plant biomass was strongly related to seed yield.
- Safflower research at Clovis, NM focused on critical stage based irrigation management, safflower physiology, evaluating safflower breeding material and adoption on DSSAT for spring safflower. (DSSAT) is being assessed to simulate safflower growth and seed yield.
- Field studies for the 2013-2014 crop year were established in Stillwater, OK and Chickasha, OK and are still underway.



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