PROJECT SUMMARY, February 2009
(Funded Proposal)

Title: Effect of Winter Cover Crop Residue and Stover Removal for Biofuel Feedstock on Corn Early and Late-Season Weed Control.

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Progress to date: A corn (*Zea mays*) field experiment was established at the E.V. Smith Research Center, near Shorter, AL. Although not originally planned, a second site was established at the Tennessee Valley Research and Extension Center in Belle Mina, AL. This second site will help account for soil and climate differences between the two regions. The experiment was a factorial treatment arrangement consisting of three levels: winter rye (*Secale cereale*) cover crop (present, harvested, or no-cover), N-rate (0, 75, 150, and 225 lbs/acre), and corn stover (retained or removed). The preceding three factors were then split to receive two early season residual herbicide treatments (either Atrazine at planting or none). The treatments were replicated three times resulting in 144 plots per location. Since the study was started on Spring 2008, a suitable area with rye could not be located at E.V. Smith or the Tennessee Valley location. Deep tillage was performed at E.V. Smith with a 4-Row KMC© in-row subsoiler. No tillage was performed at Tennessee Valley. Corn (Pioneer 31G65R) was planted with a John Deere 1700 vacuum planter in four row (36" row spacing for E.V. Smith and 30" row spacing for Tennessee Valley) plots 45 ft in length prior to the herbicide split. Corn was planted on April 10th at E.V. Smith and April 25th at Tennessee Valley. Atrazine 4L was then applied to the appropriate plots at 2 pints per acre at both locations. Nitrogen (33-0-0 + S) rates were applied as stated in the experimental protocol at Tennessee Valley. At E.V Smith, however, 50 lb N/acre were broadcast over the entire experimental area as a starter. Additionally, due to lack of space, the corn was seeded into crimson clover (*Trifolium Incarnatum*). Therefore, a true control (0 lb N/ac) was not available during the 2008 growing season. Plant populations were taken from both locations at mid-season. The plots were mechanically harvested on August 19th at E.V. Smith and on September 24th at Tennessee Valley. Slight differences in yield for N and herbicide treatments were observed at Tennessee Valley; however, there were no significant differences between treatments at E.V. Smith, possibly due to the lack of a control. The corn stover that was present after harvest was sampled from the fallow plots at each location to measure the amount of biomass present. Subsequently, the corn stover was removed from the appropriate plots at each location following experimental protocol with a pull-behind 6' landscaping rake to simulate stover harvest. A rye cover crop was then drilled into the plots at each location in the fall of 2008.