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STARTER FERTILIZER SUPERIOR IN SORGHUM TRIALS

At the sorghum growers meeting held in Milligan last week, Dr. Barney Gorden from KSU gave an excellent update on starter fertilizer responses with modern sorghum varieties. Dr. Gorden conducts research at the North Central Kansas experimental fields near Belleville, KS. He is seeing a starter fertilizer response with sorghum, even in dry years. The yield response is with no-till sorghum or minimum-till grain sorghum.

Reduced tillage systems have been proven to be effective in maintaining crop residues, reducing soil erosion losses, conserving water and having a benefit in maintaining good soil structure. There is no question that sorghum prefers warm soils to rapidly germinate and grow. Cool temperatures and residue at the surface can slow down nutrient uptake and availability. Dr. Gorden studied starter fertilizer results for three consecutive years. For his research plots, he used a liquid fertilizer knife applicator after planting to have all plots at 140 lbs of N per acre. If he applied 30 lbs of N as a starter, he applied 110 lbs of N with the knife rig.

He measured a dryland sorghum yield average of 93 bu/acre without any starter. With 2 by 2 placement, he achieved a three year average sorghum yield of 104 bu/ac with 30 lbs of P₂O₅, 111 bu/ac with 30 lbs of nitrogen (N), 116 bu/ac with 15 lbs N and 30 lbs of P₂O₅, and 127 bu/ac with 30 lbs N and 30 lbs of P₂O₅. Higher rates of N and P₂O₅, as a starter, did not increase his yield. There is no question, in his mind, that starter fertilizer increased yield by an average of 14 bu/acre with the 30-30 combination working the best. It takes a lot more iron on a no-till planter to do starter fertilizer, therefore, Dr. Gordon also tested a surface dribble band application 2 inches to the side of the seed row. This setup would be much cheaper for farmers to implement. His sorghum yield response was almost as good or within 90% of the 2 by 2 placement yield response.

The higher nitrogen rate in the starter effected how well phosphorus enters the plant. It is theorized that soil phosphates are more available to the plants, plant roots are longer, and the rooting ability of the plant is enhanced to pick up more phosphorus in the early phases of plant growth.

The starter fertilizer studies were conducted with planting dates mid to late May at a planting rate of 60,000 seeds per acre. The soil is a Crete silt loam with a soil Ph of 6.2, organic matter at 2.2 percent, Bray-1 P test at 42 ppm (high) and K test at 320 ppm (high) in the top 6 inches of soil.

Starter fertilizer effects days to bloom in sorghum. On average, starter fertilizer in this trial decreased days to bloom by 8 days. In the year 2000, (an extremely dry year in Belleville, KS), the sorghum without starter failed to head on many plants. However, with starter fertilizer, many of the plants exerted grain heads because the plants were more advanced before they became short of moisture. Starter fertilizer also lowered grain moisture levels in the fall.

In summary, Dr. Gorden's research indicates starter fertilizer can increase yield in minimum till and no-till sorghum, will reduce the number of days to mid-bloom, and decrease grain moisture



content of sorghum in both tillage systems. Dribble application along the surface to the side of the seed furrow was nearly as effective as the 2 by 2 starter. Higher nitrogen starters in combination with phosphorus gave the greatest early season growth and grain yields. A 30-30 starter is suggested but cannot be placed with the seed, it must be surface dribbled or at least 2 inches away from the seed to avoid salt injury. Starter fertilizer enhanced yield in the year 2000 even when it was the warmest and driest year in the Belleville area since 1934. Belleville is close enough to Saline County, Nebraska that sorghum producers in this area should consider this management practice on no-till sorghum to enhance yields. Broadcast applications for starter effects will not work as well. The starter effects occurred even though soil tests were high in phosphorous.

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