IPNI
Plant Nutrition TODAY
Better Crops, Better Environment...through Science

From Scientific Staff of the
International Plant Nutrition Institute (IPNI)
3500 Parkway Lane, Suite 550
Norcross, Georgia 30092-2844 USA
Phone: 770-447-0335 Fax: 770-448-0439
E-mail: info@ipni.net Website: www.ipni.net

Winter 2012, No. 7

GRAIN SORGHUM FERTILIZATION

The Great Plains produces the majority of grain sorghum in the U.S., with most production concentrated in two states. Kansas is generally the number one state for production followed by Texas. In 2011 Kansas produced 51% of U.S. grain sorghum, and Kansas and Texas together produced 78%. Most is used in feed, but some goes to ethanol and some to gluten free food products.

Grain sorghum is considered an exceptionally efficient crop. With a large fibrous root system, it is fit for production across a wide range of environments. Most in the Great Plains is grown under dryland conditions. It is often considered a rather low input crop when it comes to fertilizer, especially compared to corn. Therefore, and all too often, lesser attention is given grain sorghum nutrition. The fact remains though that it is a major crop in the Great Plains, and a brief review of a few fertility principles is in order.

Although estimates vary from source to source, and the real numbers may vary considerably depending on conditions, sorghum (grain only) removes about 66 lb N, 37 lb P_2O_5, and 27 lb K_2O per 100 bushels (5,600 lb) produced (http://nugis.ipni.net).

Nitrogen is the nutrient that most frequently limits sorghum production. Recommendations for N fertilizer will vary based on factors such as yield potential, soil texture and cropping sequence. The published recommendation equation from the KSU soil testing laboratory is based on yield goal (bu/A) multiplied by 1.6, with other sources of N and adjustments subtracted from the product of that multiplication (http://www.agronomy.ksu.edu/soiltesting). Grain sorghum begins a period of rapid growth, biomass accumulation and nutrient uptake at the five-leaf stage, approximately 3 weeks after emergence. Between this stage and booting about 70% of N will be taken up. Nitrogen fertilizer timing should account for this rapid growth period.

While grain sorghum P fertilization should be based on soil test rest results, work from north central Kansas has shown that a combination of N and P in a starter can have a marked effect on both yield and hastening maturity, even at relatively high soil test levels (Gordon and Whitney, 2002, *In* Better Crops No. 3).

As with P, a soil test is the best guide for K fertilization. The likelihood of response to K fertilizer is greatest in the eastern reaches of the region, where sandy soils and low soil K levels are more common.

Grain sorghum may also be responsive to some micronutrients. Work in Kansas has shown that in 19 of 23 study sites grain sorghum was responsive to Cl^- fertilizer (Mengel et al., 2009, *In* Better Crops No. 4). Soil critical levels for Cl^- have been well established over the past 20 years. Zinc and iron may also need to be addressed, particularly in high pH, calcareous conditions in the west.

– WMS –

For more information, contact Dr. W.M. (Mike) Stewart, Southern and Central Great Plains Director, IPNI, Phone: (210) 764-1588. E-mail: mstewart@ipni.net.

Abbreviations: N = nitrogen; P = phosphorus; K = potassium; Cl^- = chloride.

Note: ***Plant Nutrition TODAY*** articles are available online at the IPNI website: www.ipni.net/pnt