



ADVANCED AG SYSTEMS'

Crop Soil News

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**"It is the crops
that feed the
cows that make
the milk
which creates
the money."**

**Advanced Ag Systems
Research, Education, Consulting**

BMR Sorghum–Sudan as a Replacement for Corn Silage In Organic & Traditional Systems

Organic dairy and livestock farms utilize high forage diets to reduce the cost of expensive purchased organic grain supplement. Thus they need an organic source of high energy forage. Most will plant corn for silage and then apply multiple passes by cultivators in attempt to control the weeds and produce a viable, harvestable, economic crop. The cultivation utilizes a tremendous amount of fuel in addition to super aerating the surface of the soil which burns off the critical organic matter necessary for soil structure and health. Cultivating tends to leave the loosened soil extremely vulnerable to soil erosion until canopy closure. The added problem is that cultivating time comes at the same time first cutting haylage is supposed to be made. Thus what they gain in weed control they may lose in forage quality from delayed harvest and vice versa. For those who don't spray, there is a possible option now.

There is a growing interest to utilizing bmr sorghum species as a replacement for corn silage on these farms. The bmr gene was developed many years ago through a natural selection process. It has been around over 50 years.

Sorghum-Sudan is drilled into narrow rows and normally is harvested in a multi-cut system. If planted into warm (60 degree and rising) fertile soil, its rapid emergence - it will frequently emerge in three days, - out competes nearly all weeds. By planting higher seeding rates, the weeds don't stand a chance.



19 ton bmr sorghum-Sudan handled as a one cut system, if planted right has not needed a herbicide



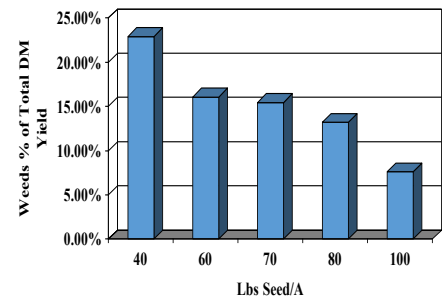
Paul Cerosaletti was able to completely eliminate the tough velvetleaf in the sorghum-sudan stand by simple population. The weed only grew where the drill completely missed.

We found in work I did in the late 1990's with bmr sorghum Sudan, as we went from normal seeding rate of 40 pounds/acre to more than double that, the total yield did not increase but the amount of weeds in that yield decreased significantly (graph at right).

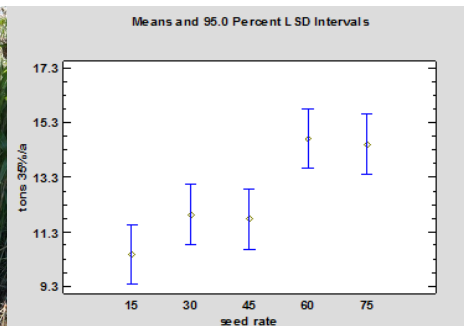
Our more recent work last year with a brachytic dwarf sorghum-Sudan found the same results in regard to controlling weeds with higher seeding rates (see photos at right). The yield also increased by increasing the seeding rate. Much of that increase was due to the absence of early weeds holding the crop back in a stressful, droughty season. We chose the brachytic bmr type because we wanted a shorter but stocky plant that will give full yields, but stand well for a one cut system.

Caution: it is a balancing act. Going to high a seeding rate with a one cut system that we discuss on the next page, could leave the crop flat on the ground after a storm (BMR sorghum species that have not had head fill yet, have amazing ability to come back nearly upright after a crop flattening wind/rain). It could also adversely affect omni-row corn heads.

Sorghum Sudan: Not Enough Seed = Harvest More Weeds



The normal 30 to 45 pound seed rate was not able to suppress the weeds.



The 60 to 75 pound seed rate suppressed all the weeds and so gave the best yield

Photo and yield graph above right: with drought stressed conditions, sorghum-Sudan still produced more than 15 tons of silage/acre with no weeds.

A new brachytic dwarf sorghum-Sudan has broader leaves than the older bmr sorghum used in the study so we tested its ability to complete ground shading at a potentially lower population to control weeds without the use of herbicides. The optimum was still 60 to 75 pounds/acre, only slightly under the older varieties. In replicated trials in the more normal season of 2013, this variety AS6402, yielded 17.8, 17.4, and 19.4 tons of 35% DM material in 30, 15, and 7.5 inch rows in a one cut harvest system. There was no lodging. We hope to compare it to a dry stalk type that may have more dry matter at the same stage of maturity.

Another crop is the non brachytic bmr 6 forage sorghum. Brachytic type forage sorghum emerges too slow for it to control weeds. We have experienced a high degree of crop failure if we did not use a herbicide with it. If the non brachytic bmr 6 is harvested before head fill it gives excellent yields like the sorghum-Sudan but at

seeding rate of 10 pounds/acre (we hope to test it this season to determine the optimum population for weed control but without adverse lodging-a work in progress). This produces a rapidly emerging crop that has thick enough stems for the directionless corn heads to harvest (see photo at right) . Planting forage sorghum at a higher rate and/or letting it go to soft dough grain maturity will mean the entire crop is on the ground. I have seen this with a number of companies non brachytic varieties I have tested over the years. Non brachytic BMR forage sorghum types need to be harvested well before much, if any grain fill.



BMR 6 forage sorghum grown without herbicides and harvested before grain fill induced lodging, gave good yields of high quality forage.

There are also newer, rapidly emerging, bmr 6 sudangrasses that in replicated trials equaled the above sorghum-Sudan in yield/acre. Sudangrasses would fit a round bale system better because of their finer stem. I would NOT try to run them through a omni directional corn harvesting head. Those harvesters don't handle finer stems very well.

We have switched to a single cut system for harvesting the sorghum-Sudan. It significantly reduces the cost of harvest (and so the cost to produce a ton of forage-which affects the profit of your milk production). It also increases the total yield without sacrificing feed quality. It keeps this high quality forage out of the dirt when harvesting. With the knives sharp, and a normal height crop, it feeds in the directionless corn heads well. Because the dry matter is often close to 30% or a little less, leachate could be a real issue. We will be trying some BMR 6 sorghums with a dry stalk gene. This will produce a crop with more dry matter at harvest for easier silo management. On going research with even wetter BMR sorghum (25% dry matter) found that if we increase the length of cut to over an inch and open the processor to greater than 6mm (or don't use one at all), there was a huge reduction in leachate as fewer plant cells were cut or ruptured to release their contents. This will be addressed in detail in a future newsletter. Care must be taken to produce quality silage without butyric acid or clostridia. We highly recommend a homolactic bacteria without added enzymes because there already is a tremendous amount of sugar available for fermentation. Some companies are making inoculants just for high sugar, wet forages.

The energy levels post fermentation from the sorghum-Sudan's equaled or exceeded that from the brachytic dwarf forage sorghums, which can produce the same milk as corn silage. Replicated research at Miner Institute found sorghum-Sudan could support the same level of milk production as corn silage in high forage diets. Because it has higher sugars and lower starch, rumen pH's were higher than the corn silage diet which positively influenced the components.

Sincerely,

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