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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

Update on Research for Management of BMR Male Sterile Forage Sorghum.

We are at the same stage of BMR male sterile sorghum as we were in the early stages of winter triticale work 30 years ago. We can see the huge benefits on farms, but we are trying to develop the best management techniques to optimize the farmer's success with this crop. Winter triticale forage was 1.5 – 2.0 tons of dry matter when we started. It is now 3.5 to 4 tons dm/A in the north and as high as 6.5 t/dm/A in the south. Harvested at peak nutrition, triticale now has higher milk potential than good alfalfa haylage. Now, we are developing management to bring male sterile BMR sorghum to that level of results and replace corn silage in the dairy diet.



BMR male sterile forage sorghum trial in NY produced over 30 T/A of 35% DM silage

Farmers growing the BMR male sterile sorghum have seen an increase in butterfat as the crop was added to the ration. With the high sugar content of 25 to 30% of DM (corn silage is 1 – 4%), you get all the benefits of extra sugar without the cost. Compared to other sugar sources, this is a steady, slow-release sugar that enhances rather than overwhelms the rumen. Production was as high as corn silage. In last year's dry conditions, nearly all reported far higher sorghum yields than with the corn silage. Corn seed cost is higher than \$180/acre while sorghum is about \$25/acre. Sorghum is without the cost and effort of multiple fungicide sprays now required on corn. It is a completely organic way of killing corn rootworms. They hatch out in the sorghum field and, after taking a bite of the root, are dead from prussic acid. It does not get corn tar spot. Sorghum planted in warm soil and narrow rows (7.5 inches) quickly shades the ground to eliminate weed competition. It also intercepts raindrop impact to stop or reduce the erosion common on newly planted corn ground. A benefit we found earlier is that deer love to hide in sorghum and then come out to eat your neighbor's corn. We have no feedback on the impact of a bear yet.

We see tremendous potential for organic farms. They plant corn silage because that is what farmers are supposed to do. As soon as it emerges, on the nice days, they are out cultivating to stay ahead and beat the weeds. Unfortunately, at that time of year, nice days used for cultivating are lost for the haylage harvest that loses quality literally by the day. For growing sorghum without herbicides, it MUST be planted in warm soils – 65F or more. This allows it to jump out of the ground and outgrow the weeds. I have measured foot-tall sorghum growing more than 3 inches a day (21 inches in a week). So sorghum is planted after the haylage harvest, which is now able to be cut on time.

When we first started working with sorghum, the seeding rate suggested by seed sales was 10 to 15 lbs. or more per acre. At that rate the population was over 160,000 seeds/ acre. In 30-inch rows, that is nearly a solid stand in the row. It had major lodging before harvest as a result. Most companies are now suggesting about 60-80,000 seeds/acre. In a 30-inch row that is still too tight, there is significant lodging. A corn planter with Milo plates and the drawbar offset 7.5 inches will plant very accurate 15-inch rows by doubling back and driving on the same tire tracks. This will allow you to double the space between the plants in the row at the same population, and greatly improve lodging resistance. Planting at 7.5-inch rows is ideal and gave us the highest yield without lodging. The plants were more uniformly spaced in the field. Unfortunately, drills are a controlled dump and do a horrible job of uniformly spacing the seeds. Adding insult to injury, the accordion tubes on most drills catch the seed and then dump it in clumps, negating the row spacing advantage. Air drills, properly set up, have been found to have the potential for very accurate seed placement.

Our research here at the University of Tennessee was targeted to determine the optimum row width and plant population for male sterile BMR sorghum. The staff worked very hard to get a replicated trial of three-row widths (7.5, 15, and 30 inches) at populations of 30,000, 60,000, 90,000, 120,000, and 150,000 seeds/acre. It came up and grew nice until early July. Then, a wicked line of thunderstorms rolled through with high winds, downpours, and heavy hail. My house lost 10 panes of glass in the front from the golf-ball-sized hail. A friend nearby got softball-sized hail that destroyed the side of her house and all the windows on that side. The worst was the many hundred acres nearby of fresh tomatoes under plastic that were just sizing the fruit. All were destroyed. My sorghum trial still had the 30,000 and 60,000 plant populations standing, the rest was flattened. Those rows that stood lasted until September, when Hurricane Helene finished completely flattening the stand. Yes, even researchers are hammered by bad weather.

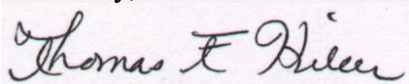
Fortunately, Jodi Letham, the regional Cornell Agronomist for Western NY, had an identical trial with 15-inch and 7.5-inch rows planted with an air drill near Geneseo, NY. It stood perfectly at all populations and yielded up to 30 tons of 35% DM silage/acre in a drought year. The advantage of the 7.5-inch row width showed in the yields of over 60,000 plants/acre were 25 to 30 tons/acre of silage. Interestingly, the NDFd30 peaked at about 60,000 harvested plants/acre to maximize the feed value. This is starting to support our hypothesis that increasing stalk diameter by controlling population and row width will increase the digestible component of the forage. This is preliminary, and more work needs to be done in this area.

We are also looking at some outside-the-box alternatives. One is to use a naturally occurring plant growth regulator, ethephon (not legal – research only). This concept is to use a normal BMR sorghum but eliminate the fertile seed so the sugars stay in the plant cells like a male sterile BMR would. This would eliminate the problem of outside pollen blowing into the field, as seen in some of our research. The trial went great, except we did not use a high enough rate and had a full seed set on all treatments. That is why we research so you will not have to make mistakes. As one farmer said with a smile, “we knew you were a professional screw up, but thank you so we don’t make the same mistakes.”

We are presently going to test seed treatments to accelerate germination and emergence. This gives the plant a running start on the weeds, which is critical for the organic farms switching to this from corn silage. We will repeat the row/population trial and the ethephon trial.

Stay tuned for more developments.

Sincerely,



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