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Warm Season Grass Demonstration For Dairy Farms

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In Maryland and neighboring states, native warm season grasses (NWSG) are being reintroduced for stream buffers and wildlife habitat and are being adapted into a few beef grazing systems. On dairy farms, especially those adapting intensive grazing systems, replacement dairy heifers and dry cows should be able to utilize NWSG particularly in the summer months when cool season grass growth is minimal. The objective of this project is to test two NWSG on two different farms with different soils and different styles of dairy grazing.

Harry Strite – dairy farmer with 30 years of experience. Initiated intensive grazing with a 90-cow herd in 1997 on 125 acres of permanent grasses on the home farm and 75 acres on a nearby rented farm.

Craig Leggett – dairy farmer with 28 years of experience. Initiated intensive grazing with an 80-cow herd in 1997 on the home farm with 110 acres in grass and the rented farm with 140 acres in grasses.

Harry Strite's six-acre field of droughty shale soil was sprayed with Roundup in May 1999 to control a variety of cool season grasses. Big bluestem was no-tilled seeded at a rate of 10 pounds PLS in June 1999 just after an inch of rain. A Truax drill was used. Then the farm experienced a seven-week period of drought. Soaking rains in September 1999 and average to above average rainfall through the 2000 summer season encouraged us that there would be some grass emergence in 2000. By September 2000, careful examination of the field showed bluestem emergence at less than 1%.

The failure of this seeding and the high cost of big bluestem ($16.50 per lb. PLS) encouraged us to try a switchgrass seeding. Enlisting the assistance of the Maryland NRCS office of GLCI, cold-treated switchgrass was no-till seeded in June 2001 at a rate of 10 lbs. PLS per acre. The third driest year on record for this area assured the failure of this seeding. Another seeding in May 2002 resulted in a stand of <5%. Mr. Strite is reconsidering reseeding this field back to an endophyte-infected fescue, either Pennington's Jessup Max-Q or possibly FFR's new Ark Plus in 2003.

Craig Leggett's 12-acre field of Hagerstown silt loam was seeded to eastern gamagrass in June 2001 at a rate of 8 lbs. PLS per acre using a no-till corn planter following a burn-down spray of Roundup. Examination of the field in 2002 showed <1% eastern gamagrass emergence. Mr. Leggett has elected to use this field for an annual ryegrass/sorghum hybrid double-crop system.

Both of these projects failed due primarily to repeated drought conditions combined with the expense of NWSG seed, difficulty in planting, lack of labeled herbicides, and the tendency of these seeds to have poor germination under less than optimum conditions.

Addendum

These two NWSG farm demonstrations funded by SARE were only a small part of an extensive series of farm demonstrations and plot work I have managed exploring the potential of NWSG as viable forage crops. Other projects are presented here in condensed form.

USDA researchers at Beltsville enlisted the assistance of the University of Maryland to promote the use of eastern gamagrass. An initial one-acre seeding at WMREC in June 1998 was very successful yielding a cutting of hay in October 1998. In 1999 and 2000, I coordinated seedings on seven farms in Maryland using different seed lots. After two years of seeding 8 lbs. PLS per acre each year, emergence ranged from <5% to almost 15%. By 2001 only two of these eastern gamagrass seedings remained on farms and both of these fields had been overseeded with switchgrass. The resulting NWSG grass stands in 2002 are about 20% eastern gamagrass and 80% switchgrass. The eastern gamagrass continues to germinate very slowly each year. The seed lot used at WMREC in 1998 was also used to seed an agroforestry plot in 1999. Germination was again over 80% in the first year. Dairy heifers grazed that plot in July 2002. Palatability and animal acceptance of the grass in heading stage was very good. Heifers were returned in October to graze stockpiled cool season and warm season grasses. The frosted four foot tall eastern gamagrass was not palatable, and animal acceptance was very poor. Animal acceptance of all cool season grass species after frost was excellent.

In 2000 I coordinated a number of other NWSG seedings with the cooperation of the Maryland office of NRCS GLCI in Washington County. Big bluestem seedings were made on two farms and switchgrass seedings were made on two farms. Rainfall in June, July, and August of 2000 was above normal levels. All seedings were successful showing an 80% plus grass stand by September 2000. Three of the seedings were no-tilled using a Truax drill. But one switchgrass seeding was done using a pasture harrow and a hand-held spinner seeder! In 2001 two additional seedings of switchgrass were made in the south part of the county where summer rainfall was below normal but adequate to provide for germination. In 2002 one of the 2001 switchgrass seeding sites was overseeded with switchgrass to fill in thin spots. Also in 2002 a field of reclaimed land (after clay was mined from the site) was seeded to switchgrass. In spite of intermittent summer rains, the field produced a 60% stand by September 2002.

Summary and Conclusions

Grazing managers on dairy, beef, and other livestock farms have shown that the most economical methods of harvesting grass is by grazing. In Maryland and the surrounding region of the Mid-Atlantic, the "summer slump" in cool season grass growth requires the supplemental feeding of stored hay, silage or other feed, which increases the cost of feeding livestock. The hypothesis was that the establishment of NWSG in dairy or beef grazing systems would provide grazing during the summer months (June-August) thereby reducing feed costs during this time. In addition, any growth of the NWSG several weeks prior to frost could provide some late fall grazing.

Our years of farm demonstrations with NWSG has shown two field factors to be critical to successful seedings—control of competing plants (weeds or other grasses) and sustained soil surface moisture. NWSG germinate and establish slowly leaving a large percentage of the soil surface exposed, especially during the seedling year. Calendar timing of NWSG seedings is not as critical as timing the seeding so there is soil surface moisture for a period of 2-4 weeks after the seeding date. A May 20 seeding into dry soil will be less successful than a July 10 seeding when several storms maintain soil

moisture for several weeks. Further, we have found that if the soil dries for several weeks then is followed by several weeks of wet weather, the germination "switch" in NWSG is turned off and the seeding will fail.

Of the three species of NWSG tested—eastern gamagrass , big blustem, and switchgrass—switchgrass seems to be the most forgiving in the timing of its seeding. This is due to its small seed size, 10-14 day germination period and inherently higher germination rate (+/-80%). Big Bluestem requires 3-4 weeks of good soil moisture. In contrast, most of our cool season grasses need only 5-7 days. Eastern gamagrass has a seed coat that makes its first year germination rate very low. Various cold and chemical treatments at Beltsville USDA-ARS have produced seed lots with first year germination rates from 0-90%. Most are in the 10% range. Surprisingly, one can expect an additional 5-10% germination for each subsequent year the stand is maintained. Another factor to be considered is the dearth of herbicides labeled for non-crop NWSG that have not become labeled for forage uses.

If NWSG could be seeded and adequate stands for forage production by Maryland standards established with regularity and at reasonable cost without violating herbicide labels, then we could see more acres being converted from marginal cool season grass pastures to NWSG. However, since the initiation of these diverse efforts with NWSG, several new grass management tools have been introduced into Maryland for the serious grass mangers to add to their toolbox.

In 1997 annual and Italian ryegrasses were introduced into Maryland on a number of Washington County farms for forage production. Utilized in a variety of systems but most effectively used in a double-crop system with improved varieties of warm season annual grasses, about 20,000 acres are seeded annually in the Mid-Atlantic. This double-crop system generally allows forage harvest in the following windows: November-December, April-May, July-August, making use of our spring, summer, and fall growing seasons. NWSG are grazed from late June to early September.

In 2000 Jessup Max-Q, an "animal-friendly" endophyte-infected fescue, was introduced into Maryland on a Washington County beef farm. Subsequent seedings are showing this fescue to seed effectively under difficult conditions, establish quickly with deep root systems, resist drought, maintain palatability, and animal acceptance during heat and drought and stockpile as effectively as K-31 for winter-long grazing. Similar fescues from other companies are being introduced.

Since most of our dairy and beef farms in Maryland and the Northeast have limited land and need to maximize the production from that limited resource, our Maryland grass farmers are carefully considering their options for summer forage production. The NWSG have a limited place in forage production in Maryland and the surrounding region as new forage alternatives provide more forage tonnage and quality with less cost and less risk than the NWSG.