EMERGENCY FORAGE PLANTINGS

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For most dairy and beef cattle producers in Wisconsin alfalfa is the primary forage crop used for winter feed supplies. In 2005 we experienced more winterkill, leaving producers faced with an immediate loss in supply of high quality forage.

This is an event we faced in (2002-2003) as many alfalfa fields in Upper Midwest were water-saturated going into winter, and had essentially no snow cover combined with some very cold temperatures. In 2004-2005 we had freezing rain with no snow cover in late December resulting in a very thick ice formation on many fields. With the concerns about autotoxicity of alfalfa the ability to replant alfalfa in winter killed alfalfa fields is not possible unless it was a fall new seeding in 2004. And even if producers risks attempting to re-seed alfalfa after alfalfa, seeding year productivity always falls far short of an established stand's productivity.

Faced with this situation most producers are faced with a forage supply shortage and will generally need to plant an annual forage crop to fill the gap. The past few years researchers at the University of Wisconsin and the University of Minnesota have conducted trials on yield and feeding value of various annual crop alternatives. Proper selection and management of the emergency forage can be a key to the farm's short- and long-term profitability and sustainability.

Emergency Forage Trial in Minnesota –2002 and 2003 Results

Three planting dates were evaluated. The early, mid, and late seeding dates at Rosemount were May 15, June 10, and June 28, respectively. Corresponding planting dates at Pelican Rapids were May 21, June 17, and July 3. Corn and brown midrib (BMR) forage sorghum plots were seeded 1-1.5 inches deep in four 30" rows with a single row planter at Pelican Rapids and with a 4-row corn planter at Rosemount. All other entries were seeded in ten 6" rows to a ¼ to 1" depth depending on seed size. Fertility was not limiting at either location. Dairy manure was incorporated prior to planting at Pelican Rapids so soil test P and K levels were very high. P and K levels at Rosemount were high. All warm-season grasses (corn, BMR sorghum, sudan, millets) received 75 lb N/ac within 10 days after planting, and those grass entries with multiple harvests received an additional 50 lb N/ac after each cutting (except the final cutting). Thus, entries with 3 harvests received 175 lb N/ac during the season.

All corn and forage sorghum plots were harvested by cutting the center two rows of each four-row plot to a 6" stubble. The remaining entries were harvested with a flail harvester at Rosemount, and with a sickle harvester at Pelican Rapids. Stubble height for sudangrass, sorghum x sudan, pearl millet, and Japanese millet was 6" to encourage regrowth, with the last harvest at 3". All other entries were cut to a 3" stubble. In

general, harvest timing was scheduled to optimize yield and quality. The exception was the final harvest of multi-cut warm-season grasses, which were allowed to mature until temperatures were too cool for continued growth in September. Thus, mid-season harvests of these entries were at vegetative stages, but their final harvest was often at a reproductive (heading) stage. Based on previous research on regrowth potential after harvesting, sudangrass, sorghum x sudan, hybrid pearl millet, and Japanese millet were scheduled for multiple harvests; and the foxtail millets were scheduled for just one harvest at boot stage.

Table 1. Influence of planting date on total season dry matter (DM) yields of emergency forages at northern Minnesota, Pelican Rapids (Otter Tail County), MN in 2002 and 2003. Yields representing multiple harvests are followed by the number of harvests in ( ).

	Planting Date					
Entry	Early May 21 + May 16		Mid June 17 + June 16		Late July 3 + July 2	
	Ton DM/acre					
Corn (81 day RM)	6.6	5.9	6.0	5.2	4.4	2.5
Corn (95 day RM)	6.6	6.8	6.0	5.4	4.3	2.5
Corn (103 day RM)	6.2	4.9	6.3	4.3	4.1	2.8
BMR Sorghum	16.7	4.4	6.9	4.4	5.1	3.4
Sudangrass	7.8 (3)	4.8(3)	4.3 (3)	3.7(3)	4.2	3.0(2)
Sorghum x Sudan	6.5 (3)	4.3(3)	3.7 (3)	3.2(3)	4.9	2.9(2)
Japanese Millet	0.9 (2)	2.3(3)	0.5	0.6(3)	2.7	1.1(2)
Hybrid Pearl Millet	6.5 (3)	3.5(3)	4.4 (3)	2.8(3)	5.4	2.6(2)
Barley	1.4	3.1	1.2	1.3	0.8	0.3
Barley/Pea	1.8	3.4	1.2	1.7	0.9	1.3
Oat/Pea	1.6	3.1	1.6	1.1	1.3	
Soybean (0.8 RM)	3.0	2.9	2.4	2.1	1.8	n/a
Soybean (2.0 RM)	5.8	2.9	3.6	2.3	1.8	1.2
Siberian Foxtail millet	1.4	2.9	2.0	1.7	1.5	
Golden German millet	2.3	5.4	3.7	3.4	2.2	2.6
Alfalfa	0.9 (2)	1.0(2)	1.1 (2)	0.4	0.4	n/a
Chuckling Vetch	0.5	1.4	1.1 (2)	0.9	1.0 (2)	0.4
Mean	4.4	3.7	3.3	2.6	2.9	1.9

Yields of warm-season species were unusually high at both locations, probably due to the combined effects of above average temperature and rainfall. Entries did not always produce less at later planting dates. For example, at Rosemount, yields of the 81 and 95 RM corn entries planted June 28 did not differ from yields for earlier planting dates. However, the longer-season 103 RM corn and BMR sorghum did produce greater

yields when planted earlier. In contrast, at Pelican Rapids, late (July 3) planting resulted in reduced yields of all four of these entries. Nevertheless, within a location, these entries produced similar yields when planted late.

Table 2. Influence of planting date on total season dry matter (DM) yields of emergency forages at Central Minnesota, Rosemount (Dakota County), MN in 2002 and 2003. Yields representing multiple harvests are followed by the number of harvests in ( ).

	Planting Date					
Entry	Early May 15 + May 8		**Mid** **June 10 + June 16**		**Late** **June 28 + July 1**	
	---------- Ton DM/acre average 2002 and 2003------					
Corn (81 day RM)	6.8	Poor Stand	5.9	5.0	5.3	4.6
Corn (95 day RM)	6.9	Poor Stand	7.7	5.6	6.9	4.2
Corn (103 day RM)	9.3	Poor Stand	9.0	4.9	6.6	4.6
BMR Sorghum	7.7	5.4	6.6	5.4	6.4	4.7
Sudangrass	8.3 (3)	3.7(3)	7.6 (3)	3.8(3)	5.9 (2)	3.9(2)
Sorghum x Sudan	7.6 (3)	2.5(3)	8.2 (3)	3.4(3)	6.4 (2)	3.6(2)
Japanese Millet	4.7 (3)	2.7(3)	3.6 (3)	3.5(3)	4.9 (2)	3.1(2)
Sorghum-sudan(BMR)	n/a	3.6(3)	N/a	3/5(3)	N/a	3.1(2)
Hybrid Pearl Millet	7.4 (3)	1.2(3)	6.6 (3)	3.0(3)	5.9 (2)	2.8(2)
Barley	2.0	2.4	1.2	2.0	1.5	1.2
Barley/Pea	2.2	2.9	2.1	2.2	0.5	1.5
Oat/Pea	2.4	3.4	2.3	2.5	1.2	1.6
Soybean (0.8 RM)	2.0	3.4	2.5	3.7	--	2.9
Soybean (2.0 RM)	2.8	4.1	--	3.7	--	2.9
Siberian Foxtail Millet	2.0	3.4	2.9	4.6	2.2	2.2
Golden German Millet	3.2	3.0	3.7	4.8	4.0	3.6
Alfalfa	1.6 (2)	3.4(2)	1.7 (2)	1.3	1.2	1.6(2)
Chickling Vetch	0.1	2.6	0.5	2.0	--	1.7
Mean	4.5	3.2	4.3	3.6	3.5	3.0

Total season yields of multi-cut warm-season grasses were competitive with corn and BMR sorghum at all planting dates. The exception was the June 17 seeding at Pelican Rapids, and Japanese millet at all planting dates and both locations. Japanese millet may produce higher yields under a one-cut system. The one-cut foxtail (Siberian and Golden German) millets produced less forage than the other warm-season forages, but they produced this yield in significantly fewer days. They tended to perform best at the middle seeding date in mid-June. The 3.7 tons DM/ac produced by Golden German

foxtail millet planted in mid-June was achieved within about 60 days. In addition, the foxtail millets established well at all planting dates and locations.

Barley and small grain/pea mixtures produced considerably less forage than the warm-season grasses, and had difficulty with weed competition at later planting dates. They do however provide forage within 60-70 days of planting and will produce good quality feed.

Alfalfa generally produced considerably less forage than all warm-season species at all planting dates, indicating the emergency forage value of the warm-season species.

WISCONSIN TRIAL 2005:

Since none of the Minnesota trials were done on sandy soil many producers in the area were interested in what would be the best emergency crop in the Central Sands area. Using funds from a UW Extension grant and the land of an Adams County farmer located north of Grand Marsh a 13 acre parcel was chosen as a site for the trials. This land had not grown a crop for 4 years and had a weak stand of alfalfa in it and had a large weed population of green foxtail. Land was tilled by disking on May 21st and May 28th to control weeds. Only a few scattered alfalfa plants appear to have survived the disking. On June 2nd the entire field was planted using the 10 ft Great Plains No-Till drill rented from McFarlands in Sac City. Most seeds were planted into moist soil at a planting depth of 3/4”-1.5” and on Saturday June 4th the field received 0.2 of an inch of rain and on Sunday morning June 5th the area received 0.6 of an inch of rain based on the rain gauge I have at the site. On July 4th the field received 0.7 of an inch. The heat (9 days of 90 degree plus) and lack of rain have affected some of the forages but they have recovered after receiving 6 inches of rain July 20-25th.

On July 11th I applied 35 lbs of nitrogen, 25 lbs of sulfur and 15 lbs of phosphorus per acre. On August 6, 2005 the plots were harvested using a pull-type windrower/conditioner at the 4 inch level. With good drying conditions the plots were ready to harvest in 48 hours and were round baled with the results in Table 3.

Table 3.	Emergency Forage Plots Central Sands, Wisconsin					
Entry	Planting Date June 2, 2005		**Aug 6 Cutting**		**Lab Analysis**	
Species	Rate/acre	Cost/acre	Tn/acre	Milk/tn	CP%	Milk/Acre
Corn (110 day RM)	20 lbs	$18	6.1	3,273	11.5	20,050
UW Grazing Composite	20 lbs (25,000 plants)		4.8	3,389	12.3	16,146
Oats	75 lbs	$10	1.4 *	3,425	12.3	4,663
BMR Sorghum-sudan	30 lbs	$15.60	4.8	3,203	11.5	15,260
Piper Sudan	30 lbs	$27	6.8	3,227	11.1	21,964
Milo/Soybean Mix	150 lbs	$33	3.4	3,034	12.0	10,325
Italian Rye Grass	35 lbs	$34	2.3*	3,167	10.7	7,329
Japanese Millet	30 lbs	$15	2.7	3,132	14.2	8,527
German Millet	20 lbs	$14	5.4	2,822	12.4	15,366
Hybrid Pearl Millet	25 lbs	$18	4.8	3,293	10.4	15,690
Forage Soybeans(R5)	50 lbs	$26	Weeds*		Weeds*	

- Since no chemical weed control was used these plots had large populations of green foxtail.

It appears we will be able to get a second cutting in mid-September and this data will be added to the trial results. There are major differences in yield, crude protein and milk per acre. Since the landowner wished to keep the field chemical free, weeds became a problem in the oats, Italian Rye grass, and forage soybeans. The warm season annuals did a good job of weed suppression and would not have needed spraying which has economic value.

Sudan grass has been a popular choice of area growers and appears to be the yield leader in total yield and milk per acre. There were not major differences in milk per ton in this trail. This information will be shared with producers in winter meetings in 2006.