













COVER CROP REFERENCE GUIDE

OTHER HELPFUL LINKS: The following links may contain useful information for referencing cover crop options.

<http://mccc.msu.edu/covercroptool/covercroptool.php> - <https://www.ars.usda.gov/plains-area/mandan-nd/ngprl/docs/cover-crop-chart/>

<p>Oats</p> 	<p>Foxtail Millet</p> 	<p>Japanese Millet</p> 	<p>Winter Wheat</p> 	<p>Barley</p> 
<p>Planting Date: August</p> <p>Exp. Harvest: Early to Mid-September</p> <p>Exp. Yield (Dry Tons/Acre): 1 to 3 dry tons / acre</p> <p>Benefits / Drawbacks: Lasting residue provides good weed control in soybeans. Tolerates cold temperatures. Slow to release Nitrogen to following crop without proper termination. Volunteer plants will need to be killed with an herbicide.</p>	<p>Planting Date: Mid-July</p> <p>Exp. Harvest: Early to Mid-September</p> <p>Exp. Yield (Dry Tons/Acre): 1 to 2 dry tons / acre</p> <p>Benefits / Drawbacks: Drought tolerant. Large biomass production with a good relative feed value. Cannot thrive in cold soil environments. Very sensitive to frost.</p>	<p>Planting Time: Mid-July</p> <p>Exp. Harvest: Early to Mid-September</p> <p>Exp. Yield (Dry Tons/Acre): 2 to 4 dry tons / acre</p> <p>Benefits / Drawbacks: Thrives high moisture environments. Root system helps prevent soil erosion. Low performance in sandy environments. Seeds scatter / rapidly invade other areas.</p>	<p>Planting Date: Mid-October</p> <p>Exp. Harvest: Late May</p> <p>Exp. Yield (Dry Tons/Acre): 1.5 to 3 dry tons / acre</p> <p>Benefits / Drawbacks: Can be effectively used as a protein supplement when grazed. Grazing can help to conserve soil moisture by reducing top growth. Slightly increased risk of weed growth potential. Requires careful management to prevent crop damage during grazing.</p>	<p>Planting Date: August</p> <p>Exp. Harvest: Early to Mid-September</p> <p>Exp. Yield (Dry Tons/Acre): 1 to 3 dry tons / acre.</p> <p>Benefits / Drawbacks: Rapid growth and fast maturity time. Grows well in soil with low fertility. Must be terminated at least two weeks prior to planting corn. Can become a weed if not completely terminated.</p>

<p>Annual Rye</p> 	<p>Teff Grass</p> 	<p>Winter Triticale</p> 	<p>Sorghum – Sudan Varieties</p> 	<p>Grain Sorghum</p> 
<p>Planting Date: July to August</p> <p>Exp. Harvest: September</p> <p>Exp. Yield (Dry Tons/Acre): 1 to 3 dry tons / acre</p> <p>Benefits / Drawbacks: Rapid establishment rate. Flourishes in colder environments. Decreased performance in dry environments. Has the potential to be a bacterial host.</p>	<p>Planting Date: Late May to Early June</p> <p>Exp. Harvest: August</p> <p>Exp. Yield (Dry Tons/Acre): 3 to 5 dry tons / acre.</p> <p>Benefits / Drawbacks: Very well suited for erosion control. Does extremely well in high heat, low water environments. Plants under extreme drought conditions can cause nitrate poisoning. Cannot be planted in wet, cool conditions. Requires warmer soil to germinate.</p>	<p>Planting Date: Late September to Early October</p> <p>Exp. Harvest: Late May</p> <p>Exp. Yield (Dry Tons/Acre): 3 to 4 dry tons / acre</p> <p>Benefits / Drawbacks: Excellent rate of survival through colder temperatures. High biomass production and rooting capability. Seed costs are typically slightly elevated. Can be infected by common wheat pathogens.</p>	<p>Planting Date: June – July</p> <p>Exp. Harvest: Mid to Late August</p> <p>Exp. Yield (Dry Tons/Acre): 3 to 5 dry tons / acre</p> <p>Benefits / Drawbacks: Sudex is a Sorghum-Sudan Hybrid. 50% of yield comes from stem. Grain heads look more like sudangrass (i.e. Johnsongrass head appearance). Lower grain yield than forage sorghum. Intermediate regrowth potential. Commonly harvested as hay, haylage, green-cop, or pasture. Recommended planting density of 15 to 25 lbs. of seed/acre. Yield is less than forage sorghums and similar to sudangrass.</p>	<p>Planting Date: March to April</p> <p>Exp. Harvest: July to September (Dependent on Planting Time)</p> <p>Exp. Yield (Dry Tons/Acre): 3 to 5 dry tons / acre</p> <p>Benefits / Drawbacks: Not considered for forage production due to low DM yields. High grain to forage ratio; grain makes up 50% or more of the total DM. Lower starch digestibility than corn. Recommended to harvest silage when grain is in the hard dough stage to reduce digestibility loss. Recommended to roll grain sorghum as it is put in the silo. Planting density of 8 to 10 lbs. of seed/acre. Silage yields vary based upon the time of harvest.</p>

Sudangrass	Forage Sorghum
	
<p>Planting Date: May to June</p> <p>Exp. Harvest: July to August (Dependent on Planting Time)</p> <p>Exp. Yield (Dry Tons/Acre): 3 to 5 dry tons / acre</p> <p>Benefits / Drawbacks: Fine stems. Better suited for pasture than other sorghums (4 to 7 ft tall). Harvested as pasture, green chop, hay or silage. Low risk of prussic acid poisoning. Good regrowth, good for multiple cuttings or grazing. Recommended planting density of 15 to 25 lbs. of seed/acre. Average silage yields of 10 to 12 tons/acre.</p>	<p>Planting Date: May to June</p> <p>Exp. Harvest: July to August (Dependent on Planting Time)</p> <p>Exp. Yield (Dry Tons/Acre): 3 to 11 dry tons / acre</p> <p>Benefits / Drawbacks: Sorgho, Sweet sorghum, Dual Purpose (grain and forage) varieties, and hybrids (8-13 ft tall). Average silage yields of 7.5 to 10 tons/acre DM. Taller, leafier and later maturing than grain sorghum. Can yield more DM per acre as silage than dryland corn; however, yields of TDN per acre are lower than corn. Low regrowth potential so they are predominately used for silage production. Yields silage that is 80% the energy value of corn silage per unit of DM. Harvest for silage at the mid to late dough stage to get optimal quality. Not recommended for grazing due to high levels of prussic acid. Recommended planting density of 5 to 10 lbs. of seed/acre.</p>



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Prussic Acid Poisoning:

Sorghum and sudangrass contain dhurrin, a compound that is broken down to release prussic acid. Young plants contain higher levels of Dhurrin, therefore it is commonly recommended to not graze or cut green chop until the plant is 18 to 20 inches tall. This holds true for young regrowth. It is also recommended to not graze or green chop for 10 days after a killing frost. Silage and hay have a low toxicity risk because prussic acid is lost during the curing process.

Feeding value of sorghums and sudangrasses

- Most sorghum and sudangrass silages are 15-20% lower in energy than corn silage
- CP levels are similar to corn silage
- Ca and P levels are higher compared to corn silage
- Accumulate Cu, which should be considered when feeding sheep

Forage	DM	CP	ADF	NDF	TDN	Ca	P
Forage Sorghum			-----%, DM basis -----				
Silage, dough stage	28	6	--	--	55	0.29	0.26
Sorghum-sudangrass							
Fresh, early vegetative	18	16.8	29	55	70	0.43	0.41
Fresh, mid-bloom	23	8.8	40	65	63	0.43	0.36
Hay, full bloom	91	8	42	68	57	0.55	0.30
Silage	28	10.8	42	68	56	0.46	0.21
Corn							
Silage, well-eared	33	8.1	28	51	70	0.23	0.22

Adapted from Sudan/Sorghum Forage Management Iowa State University Extension Publication, Fact Sheet BL-50, June 2001.

(DM: Dry Matter. CP: Crude Protein. ADF: Acid Detergent Fiber. NDF: Neutral Detergent Fiber. TDN: Total Digestible Nutrients. Ca: Calcium. P: Phosphorus)

References

UNL, Tips for Growing Forage Sorghum – UNL Crop Watch, Oct. 22, 2013; Coblenz, Wayne, K. and J. Mike Phillips. Grain Sorghum for Forage; Grant, Rick and Rick Stock. Harvesting Corn and Sorghum for Silage. University of Nebraska. Neb Guide G94-1231-A; Dr. Twain Butler and Dr. Brent Bean. Forage Sorghum Production Guide; Undersander, D.J. and L.H. Smith. Sorghum-Forage. University of Wisconsin-Extension; Carter, P.R. and D.R. Hicks. Grain Sorghum (Milo). University of Wisconsin-Extension; Anderson, Bruce E. and Jerry D. Volesky. Summer Annual Forage Grasses. University of Nebraska. Neb Guide G2183.