

Project Title: Sorghum Sudan Grass Planting Date

Objective: To identify the effect of planting date and harvest date on sorghum sudan grass yield and forage quality in northwestern Montana

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Summary:

Sorghum sudan grass was planted on three dates: May 1, May 15, and June 1 of 2021. All planting date treatments were harvested at three distinct harvest dates: August 3, August 19, and September 20. Treatments that were harvested on August 3 and August 19 were harvested again on September 20 to assess the amount of regrowth that occurred between the first harvest event and the end of the growing season.

There was a significant influence of harvest date on forage yield, with yield increasing as harvest date was delayed. May 1 and May 15 planting dates harvested at the earliest timing yielded near 12.5 ton/A and increased to 18 ton/A acre when harvested September 20. The June 1 planting date shows a lower trending overall yield compared to earlier planting dates; yields range from near 9 ton/A harvested Aug 3 to 15 ton/A harvested September 20 (Figure 1). Treatments harvested on August 3 and August 20 produced an average of 5 ton/A regrowth between the initial harvest time and regrowth harvest on September 20. The amount of regrowth was not affected by planting or harvest treatment (Table 1).

Nitrate levels declined as harvest date was delayed across all planting dates. Nitrate levels were near 1200 ppm for the August 3 harvest and declined to near 600 ppm by the September 20 harvest date (Figure 2). Protein levels decreased as harvest was delayed. Protein levels were near 12% when sorghum sudan was harvested August 3 and decreased to near 10% by the September 20 harvest date (Figure 3).

Lignin concentration increased considerably as harvest was delayed. Lignin concentrations are near 1.8% for August 3 harvest and increased to 2.2% for May 1 and May 15 planting dates and 2.6% for June 1 planting date, when sorghum sudan was harvested on September 20 (Figure 5). There is a trend for sorghum sudan planted on June 1 to have higher lignin concentration regardless of harvest date (Figure 5).

Sorghum sudan forage quality is generally higher with earlier harvest dates as a result of higher protein, TDN, and lower lignin. Delaying sorghum sudan harvest reduces overall forage quality for protein, TDN, and lignin; however, is advantageous in increasing forage yield and reducing nitrate concentrations. Selecting an appropriate harvest date for sorghum sudan involves balancing the tradeoffs between these factors.

Linear model showing the forage yield by planting date over harvest date

Table 1. Management information

Seeding date:	5/1, 5/15, 6/1, 2021	Field Location:	R4
Julian date:	121, 135, 152	Harvest date:	8/3, 8/19, 9/20
Seeding rate:		Julian date:	215, 231, 263
Previous crop:	Faba Bean	Soil type:	Creston Silt Loam
	Dicamba 12oz/A +		
Herbicide:	2,4-D 4oz/A, 6/15/21	Tillage:	Conventional
Insecticide:	None	Soil residual nutrient (NO₃⁻¹, P, K lb/A):	105-12-212
Fungicide:	None	Nutrient fertilizer applied (N, P₂O₅, K₂O lb/A):	125-45-80-10S

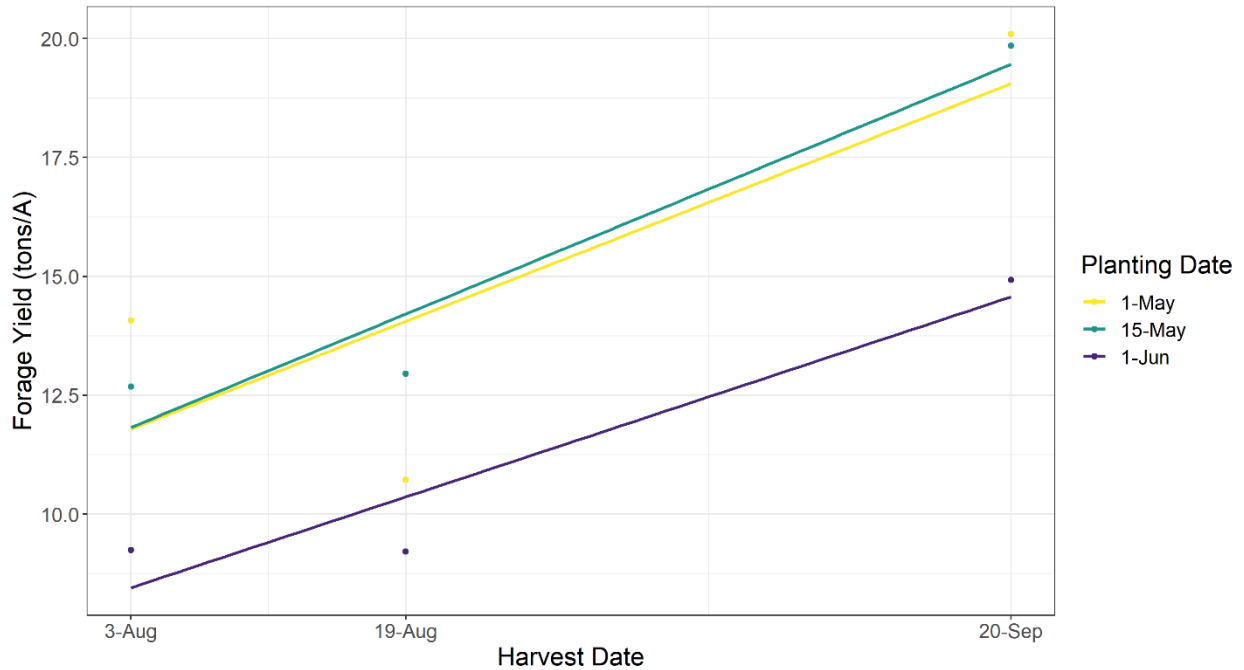


Figure 1: Forage Yield

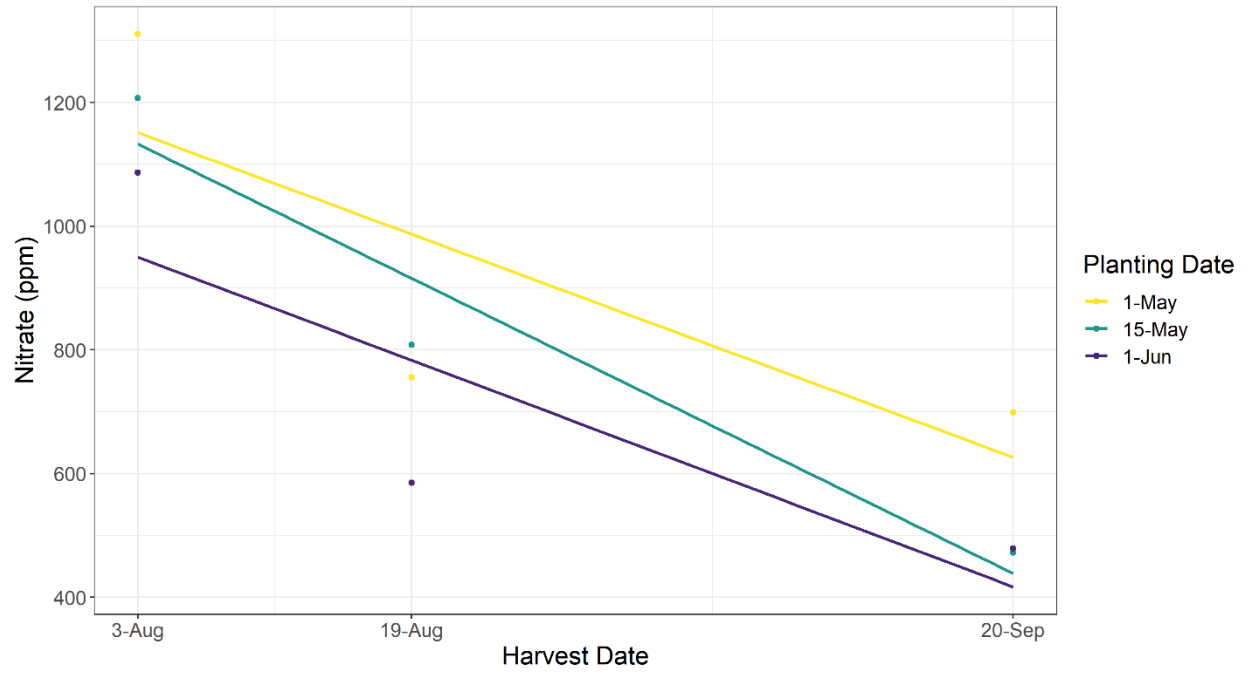


Figure 2: Nitrate

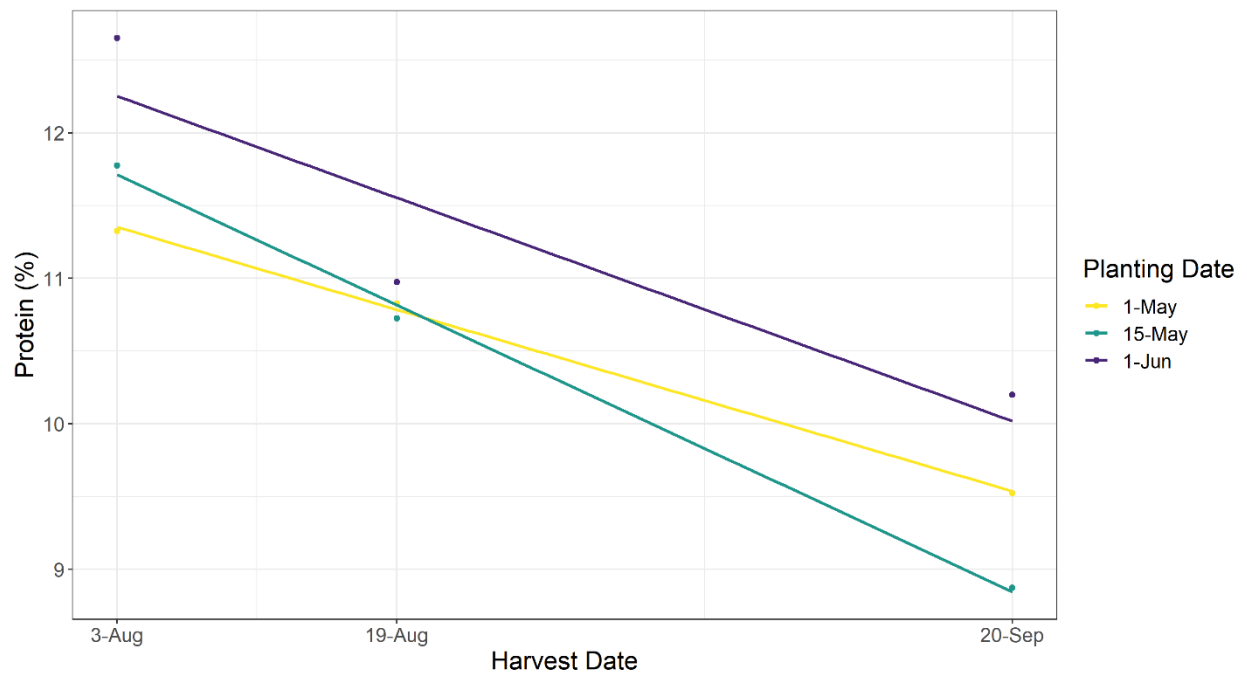


Figure 3: Protein

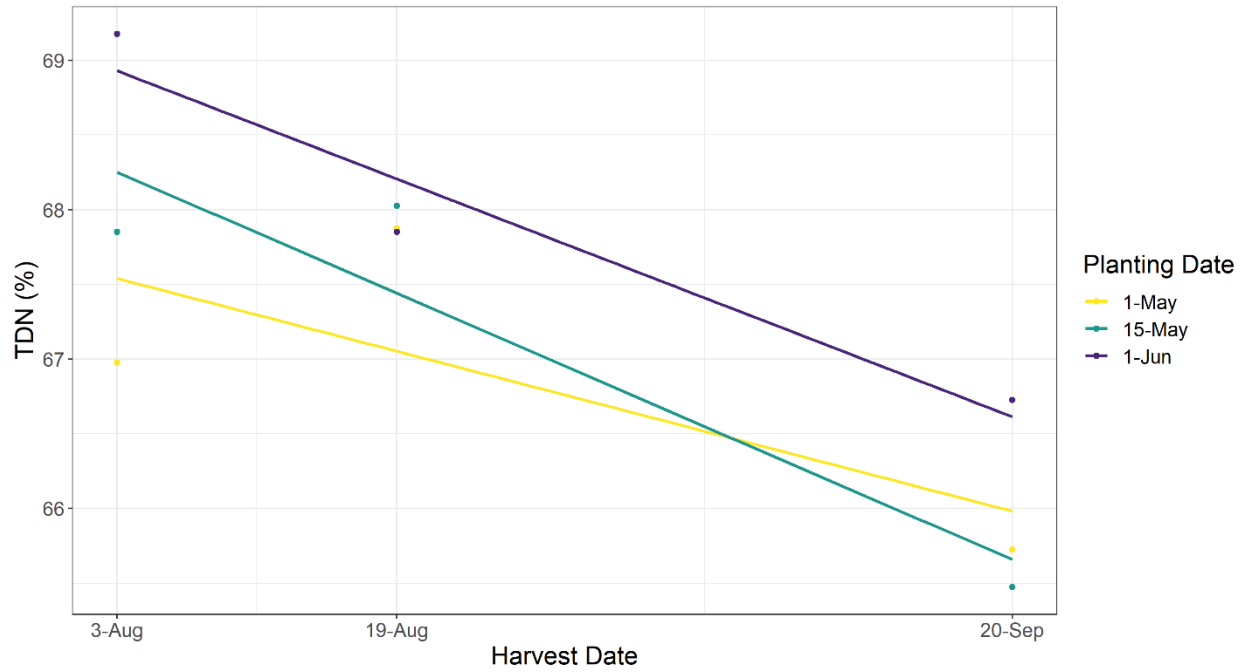


Figure 4: Total digestible nutrients (TDN)

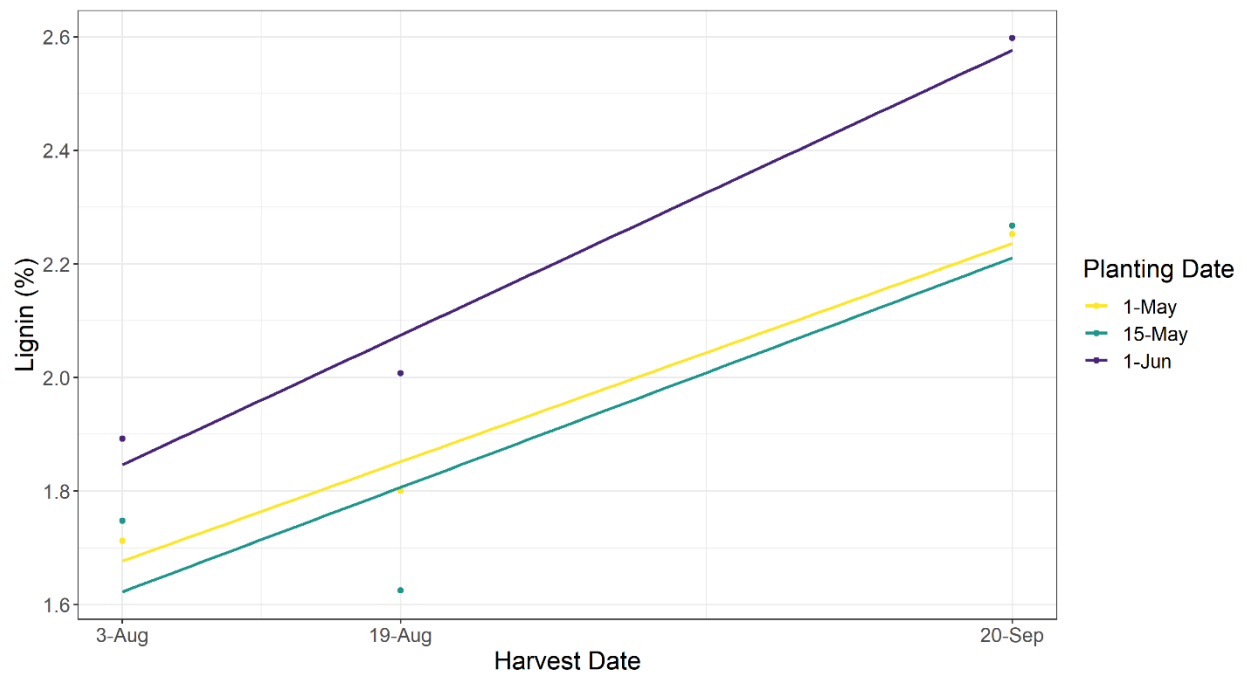


Figure 5: Lignin concentration

Table 1: Regrowth harvest			
Planting Date	Harvest Date	Forage Yield (ton/A)	Height (cm)
1-May	3-Aug	4.42	70.5
	19-Aug	4.77	52.8
15-May	3-Aug	6.08	69.8
	19-Aug	5.60	53.8
1-Jun	3-Aug	5.37	73.8
	19-Aug	3.87	57.8
Mean		5.0	63.0
CV		44.0	9.3
LSD		-	-
PR>F		0.7116	0.9431