

**Project Title:** 2021 Cool-season Forage Production Trial

**Objective:** To evaluate the yield and quality of five perennial cool-season forage grasses

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**Summary:**

This trial was on its third year of establishment. For 2021, total forage yields for Luna and Oahe were the highest, both at 4 t/A. Dryland mix, orchard, and timothy had similar yields but were inferior to Luna and Oahe (Table 2). For 2019-2021 total yields, Oahe and Luna were consistently the highest yielding species. Timothy was the lowest, and could be attributed to the poor emergence/establishment in 2019. Only the 2021 first cut tissues were submitted for quality analysis. Dryland mix had the highest crude protein. The rest had lower crude protein and are not significantly different with each other. The mean water-soluble carbohydrate (WSC) was 11.5% and Luna being the lowest. The dryland mix had the highest relative feed quality. Overall, the highest yielding species (Luna and Oahe) also had the least relative feed value, RFV (Table 2) depicting the negative association between yield and RFV.

**Table 1.** Management information

<b>Seeding date:</b>	5/29/2019	<b>Field Location:</b>	R8
<b>Julian date:</b>	149	<b>Harvest dates:</b>	6/4 - 6/18 (1 <sup>st</sup> cutting) 9/2/2021 (2 <sup>nd</sup> cutting)
<b>Seeding rate:</b>	Varied by species	<b>Julian dates:</b>	155- 169 (1 <sup>st</sup> cutting) 245 (2 <sup>nd</sup> cutting)
<b>Previous crop:</b>	Barley	<b>Soil type:</b>	Fine sandy loam
<b>Herbicide:</b>	None	<b>Tillage:</b>	Conventional
<b>Insecticide:</b>	None	<b>Soil residual nutrient (NO<sub>3</sub>-, P, K lb/A):</b>	22-15-99 (Spring, 2019)
<b>Fungicide:</b>	None	<b>Nutrient fertilizer applied (N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O lb/A):</b>	100-20-60 (Spring, 2019)
<b>Irrigation:</b>	3.5" only in 2019 for establishment		

**Table 2.** Forage quality and yields of 2021 and the 3-year total yields.

	<b>CP</b>	<b>WSC</b>	<b>RFQ</b>	<b>RFV</b>	<b>Forage YLD</b>	<b>3-yr Forage YLD</b>
	----- <b>Cut 1</b> -----					
<b>Species</b>	<b>(%)</b>	<b>(%)</b>			<b>(t/A)</b>	<b>(t/A)</b>
Oahe	8.0	11.0	124.5	84.8	4.0	10.8
Luna	8.0	9.3	111.5	78.3	4.0	10.1
Dry Mix	10.4	12.3	150.5	98.8	1.7	8.9
Orchard	7.2	13.4	127.5	100.3	1.8	6.9
Timothy	8.2	11.7	135.5	97.3	1.8	5.1
Mean	8.3	11.5	129.9	91.9	2.7	8.4
CV (%)	7.5	14.8	9.5	7.3	22.4	13.7
LSD	0.9	2.6	18.7	10.1	0.9	1.7
Pr > F	<0.001	0.04	0.006	0.0008	<0.001	<0.001

Dryland Mix: tall fescue, intermediate wheatgrass, smooth brome, Alaska brome, meadow brome

Oahe: intermediate wheatgrass

Luna: pubescent wheatgrass

CP = Crude protein; WSC = Water soluble carbohydrates; RFQ = Relative Forage Quality, RFV = Relative Feed Value, YLD = yield