

**Project title:**

Cutting Schedules and Alfalfa Fall Dormancy Impacts on Yield and Quality under Rainfed Environment.

**Objective:**

To evaluate the yield, and quality of alfalfa cultivars with different fall dormancy ratings (FD 3–7) and cutting schedules under rainfed conditions.

**Personnel:**

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**Summary:**

The experiment was laid out using a split-plot design with four replications. The cutting schedule was the whole plot factor and included three treatments: bud (harvest at 50% bud stage), 10% flower (harvest at 10% flowering stage), and staggered (the first cut at the bud stage and the second cut at over 50% flowering stage). The subplot factor was the FD ratings of the varieties (3-7). -plot factor and included three treatments: bud (harvest at 50% bud stage), 10% flower (harvest at 10% flowering stage), and staggered (the first cut at the bud stage and the second cut at over 50% flowering stage). The subplot factor was the FD ratings of the varieties (3-7). During establishment year (2024), the bud cutting schedule was harvested three times, including a final cutting

In 2024, the bud cutting schedule was harvested three times, including a final cutting event at frost, whereas the other schedules were harvested twice. In 2025, the bud and staggered cutting schedules were harvested four times, and the 10% flowering schedule was harvested three times. Dry matter (DM) yield of each plot was standardized to 70% moisture. Management information is provided in Table 1.

The two-way interactions between year and cutting schedule were statistically significant ( $p = 0.05$ ) for total seasonal DM yield in alfalfa (Table 2). In 2024, all three cutting schedules produced similar yields (Figure 1). In 2025, the 10% flower cutting schedule produced the greatest DM yield,

followed by the staggered cutting schedule, whereas the bud cutting schedule produced the lowest yield (Figure 1). The interaction between year and FD varieties was also found to be significant for total dry matter yield ( $p = 0.05$ , Table 2).

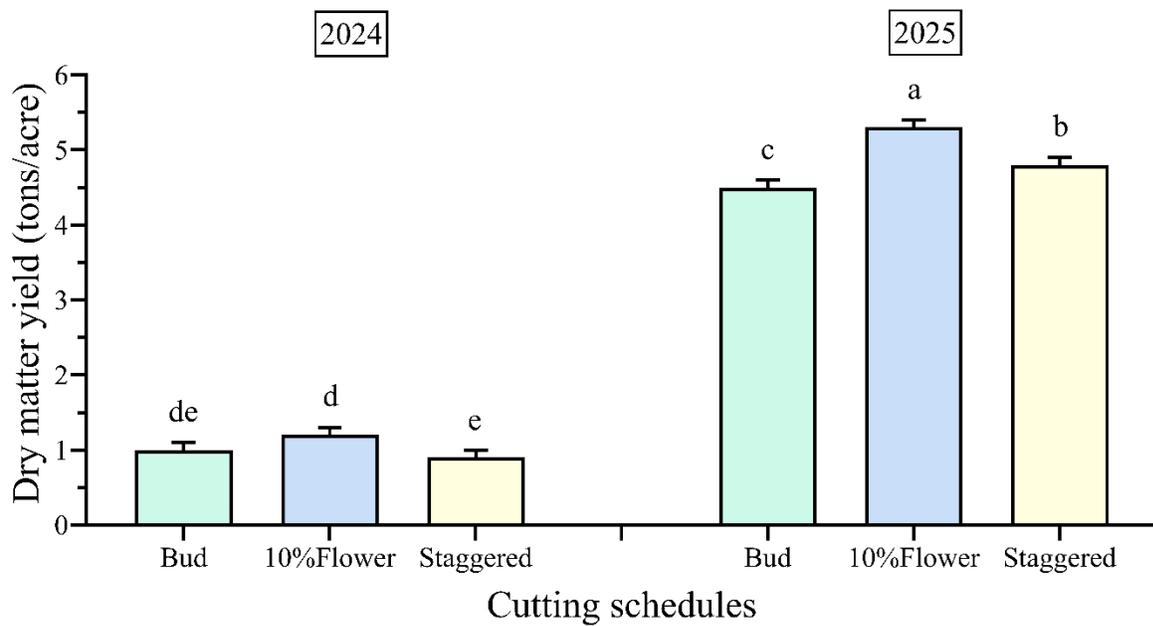
In 2024, HXV4 had the lowest yield (Figure 2). In 2025, FD3 and FD4 produced the highest DM yields, while FD7 and HxV4 had the lowest DM yields (Figure 2). Quality data are not presented due to the delay in receiving laboratory results.

**Table 1.** Management Information

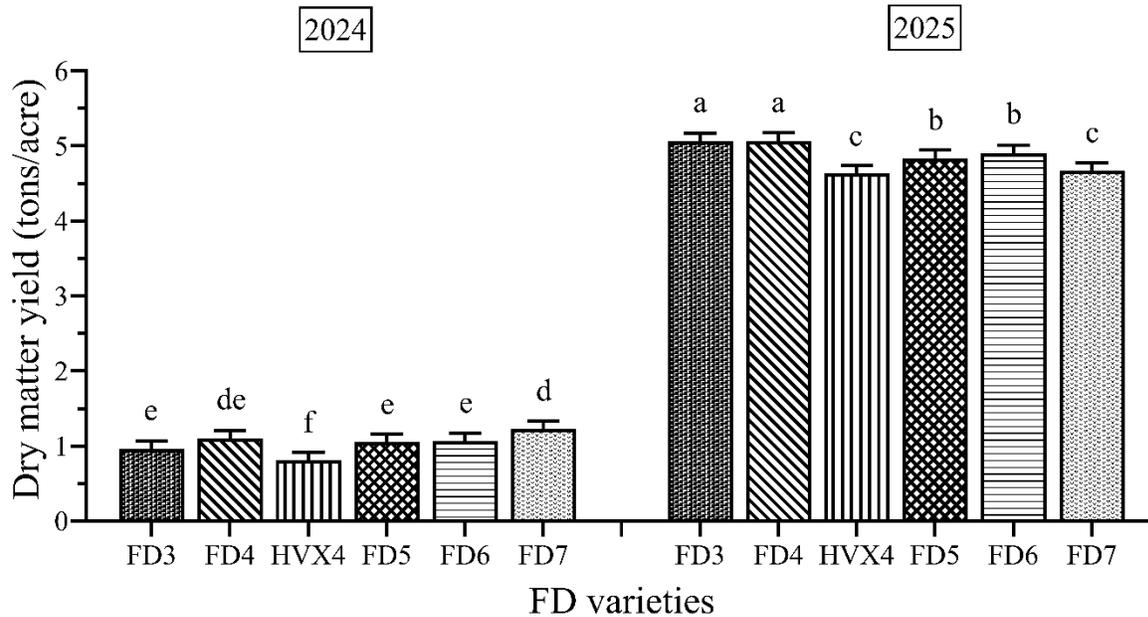
<b>Seeding date:</b>	5/23/2024 (144 Julian)	<b>Field Location:</b>	R4
<b>Seeding rate:</b>	30 seeds per ft <sup>2</sup>	<b>Harvest dates:</b>	Various by TRT
<b>Previous crop:</b>	Winter Wheat	<b>Soil type:</b>	Flathead fine sandy loam
<b>Herbicide:</b>	Buccaneer 24oz/A, Preplant: Triflurex hfp 1pt/A	<b>Tillage:</b>	Conventional
<b>Insecticide:</b>	Crusader 1EC 3.84oz/A	<b>Soil residual nutrients (NO<sub>3</sub>-, P, K lb/A):</b>	65-12-123 (Fall, 2023)
<b>Fungicide:</b>	N/A	<b>Nutrient fertilizer applied (N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O lb/A):</b>	10-60-150 (Spring, 2024)

**Table 2:** Analysis of variance for the main effects of cutting schedule, varieties, and year on alfalfa dry matter (DM) yield.

Effect	Degree of freedom	P-value
Cutting schedule	2	<.0001
Varieties	5	<.0001
Cutting schedule * Varieties	10	0.330
Year	1	<.0001
Year*Cutting schedule	2	0.011
Year*Varieties	5	<.0001
Year*Cutting schedule *Varieties	10	0.255



**Figure 1.** Effect of cutting schedules on dry matter yield, averaged across varieties and cutting events in 2024-2025. Same letter assignment denotes non-significance across cutting schedules and years at  $\alpha=0.05$ .



**Figure 2.** Effect of fall dormancy (FD) varieties on dry matter yield, averaged across cutting schedules and cutting events in 2024-2025. Same letter assignment denotes non-significance across varieties and years at  $\alpha=0.05$ .

**Acknowledgements:**

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