

Alfalfa Integration Into Pollinator Seed Mixes for Forage Production & Biodiversity in North Dakota

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Alfalfa (*Medicago sativa* L.) is a key forage crop in the northern Great Plains due to its high nutritional and economic value. However, little is known about its performance within pollinator plant systems, especially in those that are designed to enhance biodiversity. This study evaluated the effect of integrating alfalfa into pollinator seed mixes, at a reduced rate on establishment success, and biomass yield. The study was carried out in 2024 in Prosper, ND, in a randomized complete block design with four replicates under field conditions. Six treatments involved three custom made pollinator seed mixes, two commercial mixes (one with alfalfa and one without alfalfa), and alfalfa alone. Planting was done in June 2024, stand counts were conducted in fall 2024 and spring 2025. Biomass yield, forage nutritive value, crude protein (CP), and total digestible nutrients (TDN) were evaluated at harvest in the fall of 2025. The data obtained indicate that alfalfa had a strong competitive ability, dominating the mix suppressing perennial pollinator species establishment. Total biomass was significantly different among treatments ($p < 0.05$), with pollinator mixes producing more biomass than the alfalfa alone treatment. Mix 3 (with alfalfa) had significantly higher total biomass than the alfalfa-only treatment. However, when comparing alfalfa yield in the mix and in monoculture, they were lower in the mix. In addition, forage nutritive value varied among species and was influenced by growth stage at harvest. Also, legumes such as *Dalea purpurea* and *Astragalus canadensis* had high CP and TDN while alfalfa had lower values due to advanced maturity at harvest. These findings show that alfalfa can be integrated into multi-pollinator plantings for forage production and biodiversity benefits.