

NORTH DAKOTA– Cereal/Pea Intercropping for Forage

Steve Zwinger, North Dakota State University

One possible method to reduce N requirements is to grow a legume in combination with a grass, referred to as intercropping. These two plant types grow well together and can complement each other in forage and other production systems.

Field trials were conducted at the NDSU Carrington Research Extension Center during the 2008-2011 growing seasons to compare intercropping of cereal/pea forage to monocultures of cereal and forage pea. Spring cereals used in these trials were barley, oats, and triticale. Oat and triticale varieties used varied throughout the years of study. Varieties used in the trials were: Arvika forage pea, Haybet forage barley, Morton or Paul grain oats, TriCal 2700 or 141 forage triticale. Trials were planted in early May of each year in fields testing low (average 30 lbs/ac) in available N. No additional fertilizer was used to grow the forage treatments. Cultural methods including tillage, seeding date, and rate were used for weed control, with no herbicides used. Seeding rates used were 1 million PLS/ac for the monoculture cereal treatments, with the sole forage pea sown at 300,000 PLS/ac. When grown in mixtures, the cereals were sown at 800,000 PLS/ac and forage peas at 200,000 PLS/ac. All pea treatments were inoculated with rhizobia to aid in N fixation. Forage treatment harvest dates were determined by the growth stage of the forage. Triticale was harvested first when the plant was in the anthesis stage, followed by barley which was harvested in soft dough stage, and oats in early milk stage. Forage peas were harvested ~7 days after flowering.

Data gathered (Table 1) from these trials indicate growing cereals in combination with peas will have a positive impact on yield and quality in forage production. Adding peas to any one of the spring cereals increased yield when compared to sole planting of the cereal forage. Forage quality was also impacted by the addition of peas to the cereal forage crops. CP of the cereal/pea mixes were raised on average by 3% or more when compared to the sole cereal treatments. Overall, the greatest impact from adding peas to cereals appears to be on forage quality when compared to cereals planted alone, indicating intercropping with peas may contribute to the overall soil N bank.



Triticale and pea in early vegetative stage at the CREC.



Triticale in late boot stage with peas blooming.

Table 1. CREC yield and quality data, 2008-2011 average.

Forage Treatment	Plant Lodge 0-9	Harvest Moisture %	Yield DM ton/ac	CP	ADF	NDF	TDN	RFV
				% DM				
Forage Pea	5.3	80.6	1.95	16.9	27.6	36.5	67.4	146
Barley	0.0	70.5	1.78	9.7	30.5	53.0	64.1	127
Barley/Pea	3.1	76.1	2.18	13.6	29.4	44.7	65.1	133
Oat	0.0	69.7	1.78	9.4	35.1	55.7	60.6	116
Oat/Pea	5.1	76.8	2.17	12.5	32.1	47.2	62.9	119
Triticale	0.0	70.1	1.53	10.4	37.6	61.6	58.2	98
Triticale/Pea	0.8	77.0	1.92	13.3	33.0	49.7	62.0	119