

Cereal/Pea Forage Comparisons

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Using cereal grains as a forage crop is an alternative method of producing quality forage in a relatively short period of time along with integrating cropland into a livestock system. One type of annual forage production is to grow a legume in combination with a cereal, otherwise referred to as multiple cropping. These two plant types grow well together and can complement each other in the production system.

Field trials were conducted during the 2008-2011 growing seasons to compare multiple cropping of cereal/pea forage to monocultures of cereal and forage pea. Spring cereals used in these trials were barley, oats, and triticale. Varieties of oats and triticale used varied throughout the years of study and included Arvika forage pea, Haybet forage barley, Morton or Paul grain oats, TriCal 2700, TriCal 141 or TriCal Merlin forage triticale. The trials were planted in early May of each year. Trials were grown in fields that tested low (average 30 lbs/ac) in available nitrogen. No additional fertilizer was used to grow the forage treatments. Cultural methods including preplant tillage and seeding date 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 being 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 the barley which was harvested in the soft dough stage and oats in the early milk stage. Forage peas were harvested approximately seven days after flowering.

Data gathered (Table 1) from the past four years indicate that growing cereals in combination with peas will have a positive impact on both yield and quality in forage production. Adding peas to any one of the spring cereals increased yield when compared to the sole planting of the cereal forage. Forage yields of oat/pea and barley/pea mix also were increased when compared to the sole planting of peas. Plant lodging and harvest moistures were lowest for the cereal forage treatments. The addition of peas tended to make the treatments lodge more. With the exception of oat/pea forage, the cereal/pea treatments lodged less than pea forage, indicating the combined forage mix would have a greater harvest ease and be somewhat dryer at cutting.

Forage quality was impacted by the addition of peas to the cereal forage crops. Crude protein of the cereal/pea mixes were raised by an average of 3 percent or more when compared to the sole cereal treatments. ADF and NDF of the cereal/pea forage treatments compared to the cereal forage treatments indicate forage of higher quality. When peas were added to the mix calcium values doubled compared to the sole cereal forage. Overall, the greatest impact from adding peas to cereals appears to be on forage quality when compared to cereals planted alone.

Cereal Pea											Carrington
Forage Treatment	Plant Lodge	Harvest Moisture	Forage Yield DM	Hay Yield 15% M	CP	ADF	NDF	Ca	Phos	TDN	RFV
	0-9	%	ton/ac	ton/ac	----- % DM -----			-----			
Forage Pea	5.3	80.6	1.95	2.29	16.9	27.6	36.5	1.12	0.35	67.4	146
Barley	0.0	70.5	1.78	2.09	9.7	30.5	53.0	0.42	0.31	64.1	127
Barley/Pea	3.1	76.1	2.18	2.56	13.6	29.4	44.7	0.81	0.32	65.1	133
Oat	0.0	69.7	1.78	2.10	9.4	35.1	55.7	0.39	0.31	60.6	116
Oat/Pea	5.1	76.8	2.17	2.53	12.5	32.1	47.2	0.83	0.32	62.9	119
Triticale	0.0	70.1	1.53	1.64	10.4	37.6	61.6	0.39	0.31	58.2	98
Triticale/Pea	0.8	77.0	1.92	2.27	13.3	33.0	49.7	0.78	0.32	62.0	119

CP = crude protein; ADF = acid detergent fiber; NDF = neutral detergent fiber; Ca = calcium; Phos = Phosphorus; TDN = total digestible nutrients; RFV = relative feed value.



**Everleaf oats and Arvika pea
prior to forage harvest.**