

PROJECT TITLE: Dry field pea and hay-barley seeding rate affects on dry matter forage production.

EXPERIMENT NO: #900701

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OBJECTIVES:
To evaluate the effects of hay barley seeding rate at a constant dry pea rate on forage yield under dryland conditions in Central Montana.

METHODS:
Austrian winter peas, from the world population, and Haybet hay-barley were seeded on April 24, 2001 into re-cropped winter wheat stubble. The trial received the same management as the Uniform Pea-Barley Forage Trial (870701; See **Table 22-Moccasin site**). The following seeding rates were used:

Treat.	Description	Seeding Rates						Seeding Ratio
		Pea	Barley	Plot	Pea	Barley	Plot	
#		----- (plants/ft ²) -----			----- (lbs/acre) -----			(lbs)
1	Pure Pea (optimal)	8	0	8.0	85	0	85	
2	Pure Pea	6	0	6.0	60	0	60	
3	Pea-Barley (1)	6	6	12.0	60	20	80	3.0:1
4	Pea-Barley (2)	6	8	14.0	60	24	84	2.5:1
5	Pea-Barley (3)	6	10	16.0	60	30	90	2.0:1
6	Pea-Barley (4)	6	12	18.0	60	40	100	1.5:1
7	Pure Barley	0	14	14.0	0	45	45	

However, due to poor seedling vigor in the barley, the desire densities were not accomplished.

RESULTS: Dry matter forage production averaged 3,086 pounds of dry matter per acre (**Table 33**). The pure barley treatment (#7) had the most dry matter forage production, with 3,915 pounds per acre (1.95 tons/acre), but was equal to (5% level) the Pea-Barley mixed treatments Nos. 4, 5 and 6. Dry pea stands were very similar to target rates, barley stands, however, were significantly less than their target rates. No differences in maturity or canopy heights were observed within the study. Based on the actual stand densities the data set was subdivided into three barley densities: 3, 6 and 9 plants per square foot and a supplemental analysis was performed to show the affect of barley density on pea forage production (**Table 33B**). Dry pea plant stand densities were not significantly different within the subset, while forage production potential was significantly impacted by increased barley density. At a plant density ratio of 2:3 (6 plants pea to 9 plants barley), dry pea production was only 707 pounds per acre, while at the same plant density (6 plants/ft²) the pure dry pea stand yielded 2,171 pounds per acre. Barley plants density and forage production increased at very similar rates. Overall, dry matter forage production was greatest when the barley density was highest, indicating barley plant density controls forage production of pea-barley mixes.

FUTURE PLANS:
No future plans have been made to continue this study.

Table 33. 2001 Pea-Barley Seeding Rate Study - Barley seeding rate effects on dry pea forage production.
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Treatment		Stand Density			Flower/Head		Canopy Height			Dry Matter Production		
No.	Pea Barley	Pea	Barley	Plot	Pea	Barley	Pea	Barley	Plot	Pea	Barley	Plot
#	(seeds/ft ²)	----- (plants/ft ²) -----			(date)		----- (inches) -----			----- (lbs/acre) -----		
7	0 14		8.5^a	8.5		7/1		29.0	29.0		3,915^a	3,915^a
6	6 12	5.7	9.2^a	14.9^a	7/3	6/30	27.7	30.7	29.2	707	3,083 ^a	3,789 ^a
5	6 10	5.8	6.2	12.0	7/3	7/2	28.7	30.3	29.5	1,199	2,077	3,276 ^a
4	6 8	6.6	6.0	12.7	7/3	7/1	29.0	30.0	29.5	1,079	2,197	3,275 ^a
3	6 6	6.2	3.2	9.3	7/3	7/1	30.0	30.3	30.2	1,697	1,081	2,778
1	8 0	8.6^a		8.6	7/2		27.3		27.3	2,400^a		2,400
2	6 0	6.4		6.4	7/3		28.0		28.0	2,171 ^a		2,171
Means		6.6	6.6	10.4	7/3	7/1	28.4	30.1	29.0	1,542	2,470	3,086
LSD (0.05 by t)		1.1	1.4	1.5	ns	ns	ns	ns	ns	500	907	735
CV% (s/means)		9.4	11.4	8.1	0.0	0.3	3.9	4.7	4.1	17.8	19.5	13.39
F-value		9.2	30.0	37.1	0.1	1.0	2.3	0.6	2.0	17.4	14.9	7.78

Table 33B Analysis of data, split out by true barley density, showing barley density affects on dry pea yield.

Treatment		Stand Density			Flower/Head		Canopy Height			Dry Matter Production		
No.	Pea Barley	Pea	Barley	Plot	Pea	Barley	Pea	Barley	Plot	Pea	Barley	Plot
#		----- (plants/ft ²) -----			(date)		----- (inches) -----			----- (lbs/acre) -----		
1	6 0	6.4		6.4	7/3		28.0		28.0	2,171^a		2,171
2	6 3	6.2	3.2	9.3	7/3	7/1	30.0	30.3	30.2	1,697 ^a	1,081	2,778
3	6 6	6.2	6.1	12.3	7/3	7/2	28.8	30.2	29.5	1,139	2,137 ^a	3,276 ^a
4	6 9	5.7	9.2	14.9	7/3	6/30	27.7	30.7	29.2	707	3,083^a	3,789^a
Means		6.1	6.1	10.7	7/3	7/1	28.6	30.4	29.2	1,428	2,100	3,004
LSD (0.05 by t)		ns	1.5	1.1	ns	ns	ns	ns	ns	627	1,336	890
CV% (s/means)		8.3	10.9	5.2			3.7	4.4	3.6	22.0	28.1	14.83
F-value		0.93	61.0	128.7			2.9	0.11	2.19	12.5	8.7	7.23

ns - Indicates no statistical significance at 10% level.

^a - Denotes values equal to highest value (in **bold**) based on LSD_(0.05).