Title: Effect of nitrogen and phosphorus on yield and quality of spring wheat and durum.

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Objectives: To evaluate the effect N and P have on yield and quality in spring wheat and durum.

Results: The data are summarized in Table 3. Yields are very similar for Spectre durum and McNeal spring wheat, however, McNeal had slightly high protein. Both varieties had similar increases in yield and protein due to N, and both varieties had similar yield increases due to 25 P_2O_5 and yield decreases due to 50 P_2O_5. These responses are shown graphically in Figs. 7 to 10. High P fertilizer added to soils with very high P soil tests (in this case 33 ppm) often reduces yield. These data indicate that durum response to fertilization is very similar to spring wheat.

Summary: Preliminary data indicate that durum yield and protein response to N and P is similar to spring wheat.

Future Plans: Continue evaluation of durum and spring wheat response to N and P fertilization.

Table 3. The effect of N and P on spring wheat and durum yield and quality. Experiment located at Western Triangle Ag. Research Center, Conrad, MT, 1997.

No.	Treatment N (lbs/ac)	Treatment P_2O_5 (lbs/ac)	Crop	Grain Yield (bu/ac)	Test Weight (lbs/bu)	Protein %
1	150	50	**Durum**	62.63	60.76	14.55
2	150	25	**Durum**	75.23	61.54	12.50
3	150	0	**Durum**	66.92	60.96	13.63
4	100	50	**Durum**	62.69	60.85	13.50
5	100	25	**Durum**	72.92	62.74	11.10
6	100	0	**Durum**	71.14	61.94	11.88
7	50	50	**Durum**	64.75	62.16	11.00
8	50	25	**Durum**	73.22	63.02	10.27
9	50	0	**Durum**	61.55	62.29	10.40
10	11	50	**Durum**	61.60	63.44	8.85
11	5.5	25	**Durum**	63.35	63.51	7.73
12	0	0	**Durum**	58.27	63.42	8.20
13	150	50	**Spring Wt.**	65.54	60.89	13.25
14	150	25	**Spring Wt.**	79.07	61.92	13.02
15	150	0	**Spring Wt.**	64.11	60.95	13.48
16	100	50	**Spring Wt.**	64.67	61.12	13.10
17	100	25	**Spring Wt.**	77.05	62.35	12.13
18	100	0	**Spring Wt.**	66.33	61.34	12.77
19	50	50	**Spring Wt.**	66.76	62.37	11.43
20	50	25	**Spring Wt.**	68.65	62.90	10.32
21	50	0	**Spring Wt.**	63.52	61.80	11.18
22	11	50	**Spring Wt.**	60.55	62.76	10.32
23	5.5	25	**Spring Wt.**	65.49	62.88	10.15
24	0	0	**Spring Wt.**	53.87	62.83	9.20
				Summary Statistics		
Experimental Means				66.24	62.11	11.41
Error Mean Square				66.34	0.846	0.9204
P-value				0.0066	0.0000	0.0000
Standard Error				8.15	0.92	0.96
Standard Error of the Mean				4.07	0.46	0.48
C.V. 1: (s/mean)*100				12.29	1.48	4.20
LSD (0.05)				11.48	1.30	1.35
				Variety Summary		
Durum (Sceptre)				66.19	62.22	11.13
Spring Wheat (McNeal)				66.30	62.01	11.70
LSD (0.05)				NS	NS	0.39

Table 3. Continued

	Grain Yield (bu/ac)	Test Weight (lbs/bu)	Protein %
	Nitrogen Summary		
150	68.92	61.17	13.40
100	69.13	61.72	12.41
50	66.41	62.42	10.77
0	60.52	63.14	9.08
LSD (0.05)	4.69	0.53	0.55
	Phosphorus Summary		
50	63.65	61.79	12.00
25	71.87	62.61	10.90
0	63.21	61.94	11.34
LSD (0.05)	4.06	0.46	0.48
Interaction P-value	0.4593	0.4057	0.6153

Notes:
Varieties:
Durum = Sceptre
Spring Wheat = McNeal
Seeding Date: 5/5/97
Harvest Date: 9/3/97
Growing Season ppt: 7.45"
Planting Rate: 20 seeds/ft^2
Previous Crop: Fallow
Fertilizer: N applied as urea (broadcast) and P applied with the seed. 30 lbs K/ac as KCl applied to all plots (broadcast). Note: broadcast treatments applied 5/8/97.
Herbicide: Bronate @ 1pt/ac

Soil Tests:
O.M. = 2.6%, pH = 8.0

Depth (ft.)	Cl	NH_4-N	NO_3-N	SO_4-S
	----------(lbs/ac)----------			
0-1	9.9	8.9	34.3	159.0
1-2	12.9	9.7	14.4	172.0
2-3	8.1	10.1	4.8	215.0
3-4	11.7	9.6	4.0	1223.0

Element (0-6")	Amount (ppm)
P	33
Zn	0.5
Mn	7.5
K	376
Cu	1.7
Fe	9.3
B	0.3

Fig. 7. The effect of N and P on Durum Yields.

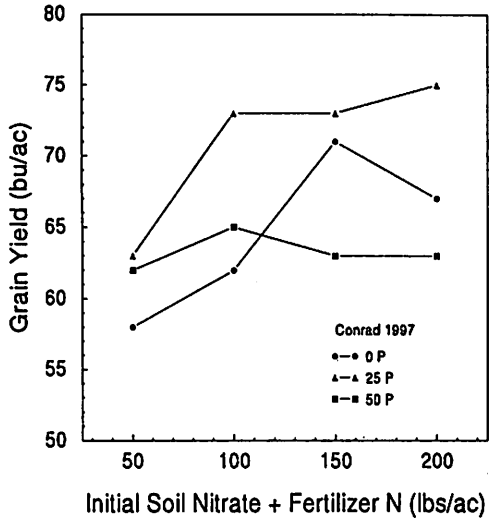

Fig. 8. The effect of N and P on Spring Wheat Yields.

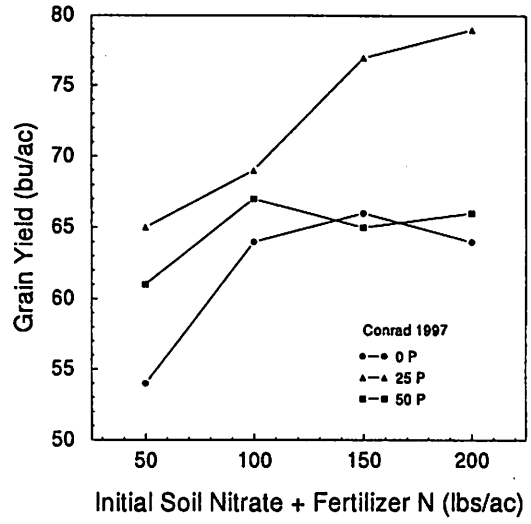

Fig. 9. The effect of N and P on Durum Protein.

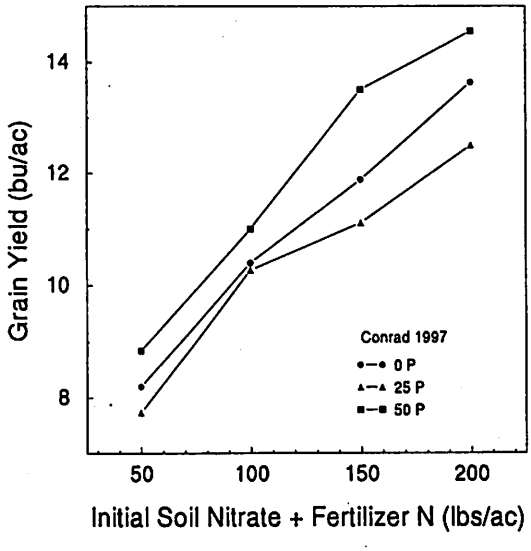

Fig. 10. The effect of N and P on Spring Wheat Protein.