

Interim Progress Report to Terry Roberts, PPI

Jan. 2, 1998

1. N response of winter vs spring wheat on alfalfa-breaking

- lab analysis of grain N currently underway
- information available in March report
- For 1998, we will add a Phosphorous treatment into this study, so that we can investigate the NxP interaction of winter wheat after alfalfa.

2. Effect of Cl on leaf spotting and yield of winter wheat grown after alfalfa

- Leaf spotting assessed using image analysis (Lamari, pers comm) on flag leaves sampled during early grain-filling.
- Results showed no effect of the treatments

Treatment	Percent Flag Leaf Area Infected
Control	28
25 kg/ha KCl	27
50 kg/ha KCl	32
25 kg/ha CaCl	31
50 kg/ha CaCl	35

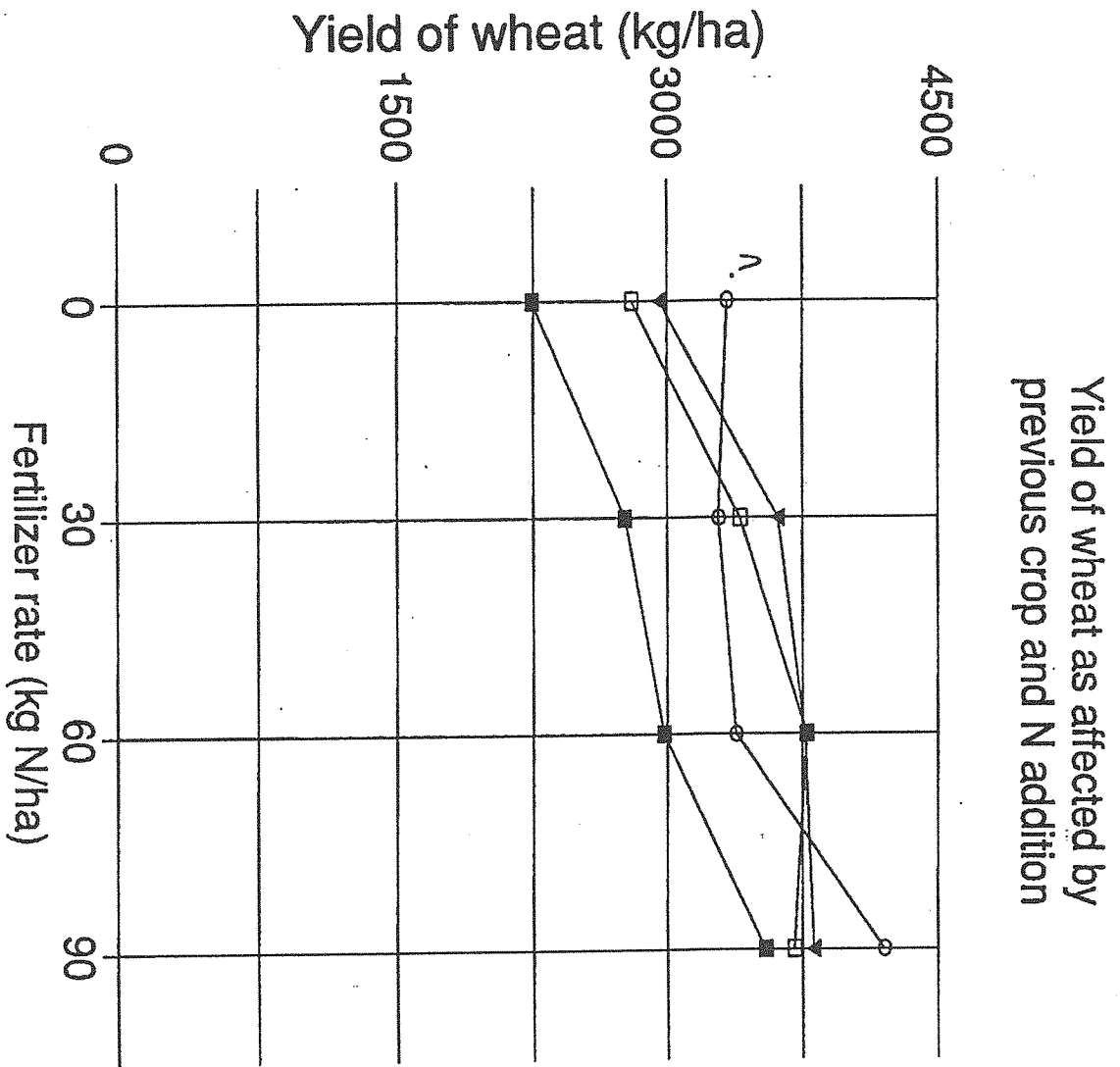
- Yield data available with March report

3. N Response of spring wheat grown 1, 2 or 3 years after alfalfa

- This work was conducted in 1996 and 1997 on the Winnipeg rotation study. It does not relate directly to the project, but it is complementary.
- Data for grain yield, grain protein concentration and grain N uptake shown in three figures.

4. Alfalfa in rotation in combination with N fertilization enhances wheat protein

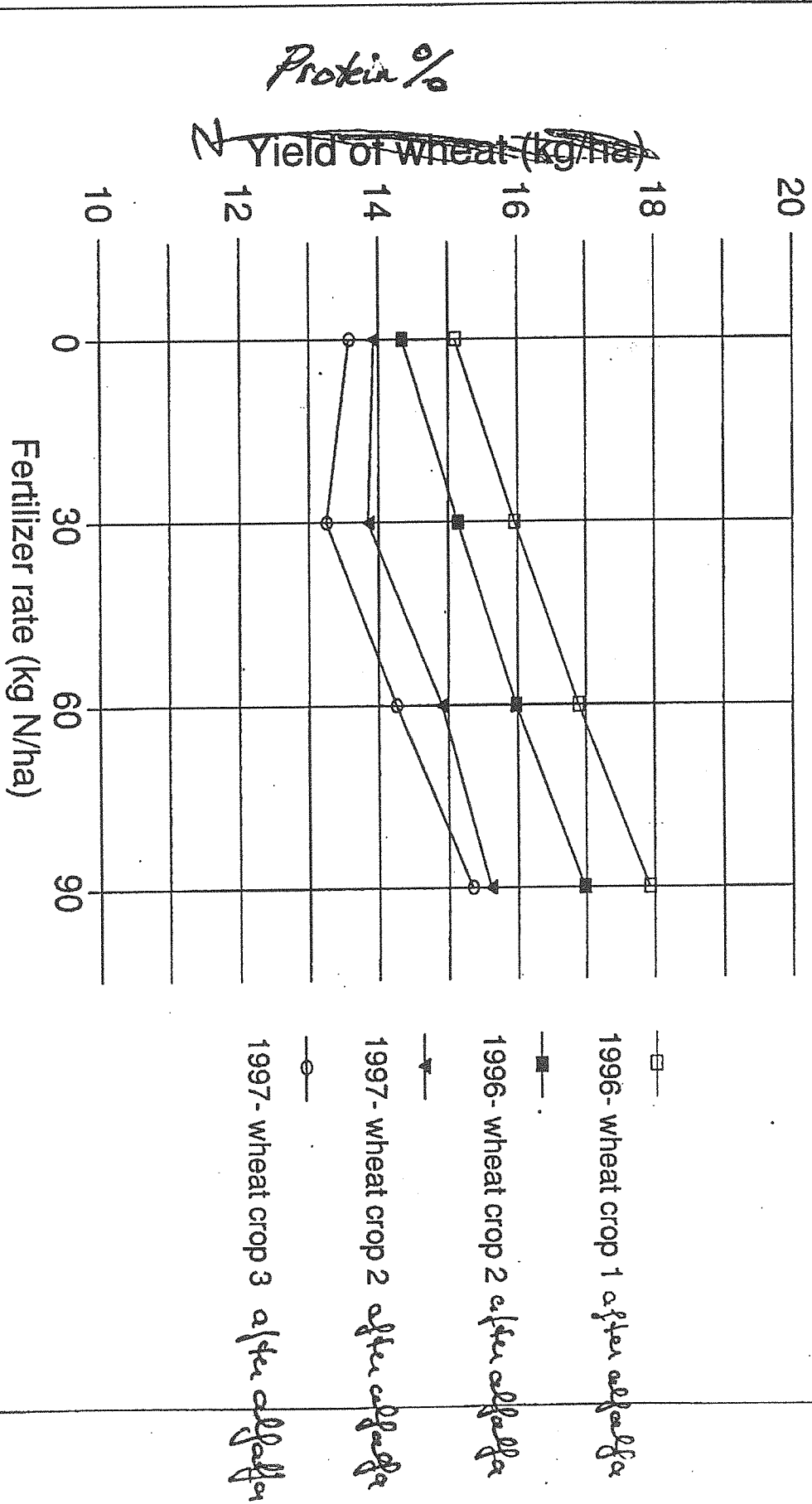
- I will send along one table of data from this study. These are interesting results which will be presented at the upcoming protein meeting by the graduate student, David Forster. The results clearly show that the combination of alfalfa in rotation with N fertilizer provides higher protein than either alfalfa or N alone.

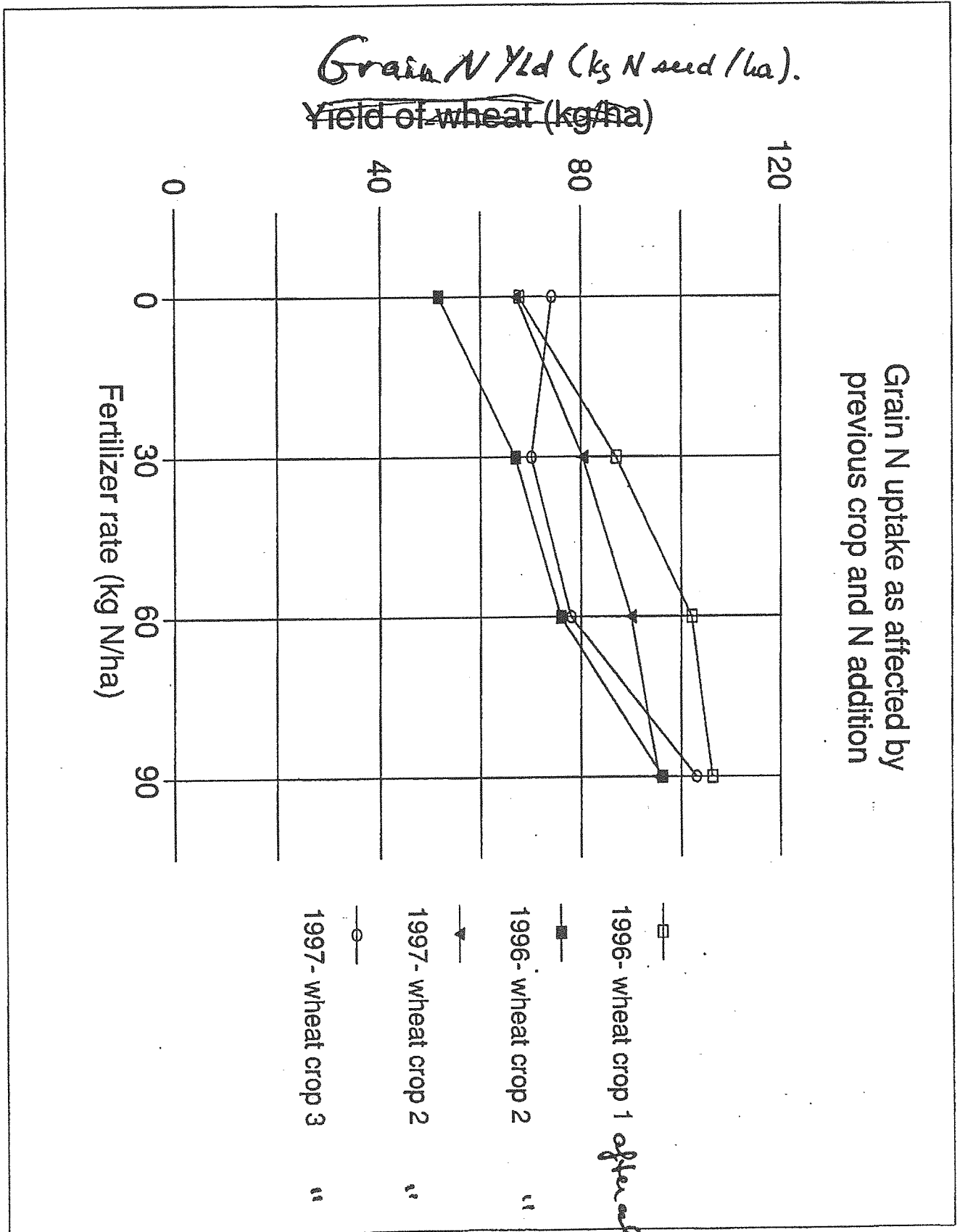


- 1996 - wheat crop 1
- 1996 - wheat crop 2
- ▼— 1997 - wheat crop 2
- 1997 - wheat crop 3

after alfalfa

Grain protein conc as affected by previous crop and N addition





Grain N uptake as affected by previous crop and N addition

objectives: 1) ~~effect~~ stand length on gpc.
 2) duration of gpc benefits

Table 15: Grain protein concentration as affected by crop rotation and fertilizer nitrogen addition in treatments terminated by tillage (grain protein concentration (%)). Analysis of variances for grain protein concentration is summarized for each year, 1991 to 1997.

Rotation	Fertilizer	Year						
		1991	1992	1993	1994	1995	1996	1997
Annual	+	18.6	14.9	17.4	15.9	14.8	14.7	14.0
	-	14.9	15.2	16.2	15.7	13.3	13.7	12.7
First crop after alfalfa	+	18.0	16.0	19.4	16.0	-	-	-
	-	16.5	13.5	18.7	12.1	14.3	15.3	-
Second crop after alfalfa	+			14.7	16.7	15.9	15.7	15.1
	-			13.1	15.4	13.0	14.3	12.8
Third crop after alfalfa	+				16.7	15.8	15.7	15.1
	-				15.2	13.4	14.2	12.8
Crop 4 after alfalfa	+					15.5	15.9	14.5
	-					12.5	13.5	12.9
Crop 5 after alfalfa	+						16.0	14.6
	-						13.3	12.4
Crop 6 after alfalfa	+							13.5
	-							12.7
Rotation (Main factor)		0.5052	0.6106	0.0006	0.0092	0.1855	0.0172	0.0746
Fertilizer N (subplot)		0.0125	0.0805	0.0004	0.0306	0.0001	0.0001	0.0001
Rotation * Fertilizer N		0.1739	0.0419	0.3237	0.2720	0.0722	0.0493	0.1464