

RESPONSE OF CEREAL VARIETIES TO FERTILIZER

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At Swift Current I am approaching the response of cereal varieties to fertilizer in three ways. I will deal with each of them separately.

- (1) Regional Variety Tests. These have been run in duplicate for the past two years at five locations throughout the Southwest. One portion of the test has no fertilizer applied, while the adjacent portion has 40 pounds of 11-48-0 applied with the seed. These locations were not selected for low fertility, but rather for a range of soil types and climate. The two-year average yield increase from the fertilized plots over that from the unfertilized plots for each variety for the five locations is shown in Tables 1, 2, 3 and 4. The yield from the fertilized plots was lower than from the unfertilized plots for most varieties at one or more locations in at least one year. This is shown in the tables as the number of reductions in yield.
- (2) Line x Fertilizer Test. This consists of 16 lines of wheat in 1972 and 24 lines in 1973 at both Indian Head and Swift Current. The fertilizer treatments were check, 10 lb N + 20 lb P₂O₅/acre and 50 lb N + 50 lb P₂O₅/acre. Neepawa was the only variety that showed a significant yield increase from 50-50 at both locations in both years. There were significant interactions for variety x fertilizer for weight per bushel, 1000 kernel weight and N and P content of the grain.
- (3) Variety x Fertilizer Tests. This consists of three or four varieties each of wheat, durum and barley with seven combinations of rates of N and P, including the three rates used in the line x fertilizer test. These tests were conducted on Sceptre clay near Stewart Valley and on Hatton fine sandy loam near Swift Current. There was no significant interaction between variety and fertilizer on yield for any crop. The nitrogen content of the grain showed a significant interaction for durum and barley, but not for wheat. The weight for bushel and 1000 kernel weight interactions were significant for most of the individual tests.

These findings indicate that there are small differences in the reaction of varieties to fertilizer as measured by yield. They are usually masked by the larger variety x location and fertilizer x location interactions. The interaction of variety and fertilizer shows up more in the bushel and 1000 kernel weights and in the nitrogen and phosphorus content of the grain than it does in yield. This applies to the three types of grain tested. Further testing is needed to more clearly define the response patterns of the different varieties.

Table 1 Wheat yield increase from 40 lb/ac of 11-48-0
cwt/ac

Variety	Mean Yield Increase	No. Of Reductions In Yield
Manitou	1.2	3
Cypress	1.1	4
Neepawa	3.3	1
Napayo	1.6	2
Pitic 62	1.9	3
Glenlea	2.3	2
CT 774	1.8	2
NB 106	1.2	3 (1 year only)

Table 2 Durum yield increase from 40 lb/ac of 11-48-0
cwt/ac

Variety	Mean Yield Increase	No. Of Reductions In Yield
Stewart 63	1.5	4
Pelissier	3.3	1
Hercules	2.5	2
Wascana	1.6	4
Wakooma	1.6	4
DT 332	3.8	1 (1 year only)

Table 3 Barley yield increase from 40 lb/ac of 11-48-0
cwt/ac

Variety	Mean Yield Increase	No. Of Reductions In Yield
Conquest	7.3	0
Paragon	5.1	2
Galt	6.9	1
Bonanza	5.1	2
Betzes	5.5	1
Centennial	7.3	1
Fergus	8.3	0
Hector	7.4	1

Table 4 Oat yield increase from 40 lb/ac of 11-48-0
cwt/ac

Variety	Mean Yield Increase	No. Of Locations	No. Of Reductions In Yield
Garry	1.4	8	2
Rodney	1.9	3	0
Harmon	2.1	8	0
Kelsey	2.5	8	2
Sioux	3.2	8	2
Fraser	1.9	8	2
Random	2.0	8	3
Gemini	1.7	8	2
Hinoat	2.4	5	0
1863-4	.1	5	1
1863-5.15	.7	5	1
OT 186	1.0	5	1