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SOIL FERTILITY

Yield Increase of Conquest Barley From the Application of Nitrogen Fertilizers in Northeastern Saskatchewan in Relation to the Soil Test for Nitrogen (NO_3) on Loam, Clay-Loam and Clay Soils.

The soil test for nitrogen is a valuable aid in predicting yield response of a crop on stubble land. Soil test recommendations for fertilizer application rates are based on set values for the prices of grain and of fertilizer. Many farmers would like to know what yield could be expected from the recommended rate and what yield could be expected if a lower fertilizer rate were applied. With this information, the current prices of fertilizer and grain could be taken into consideration to determine the most economical fertilizer rate. For example, if a soil sample was taken in the fall and tested 25 lb of available soil nitrogen, we would add 15 pounds of nitrogen which is assumed to accumulate over the winter period. (Note: Some soils do not accumulate additional available nitrogen over the winter.) This brings the soil test to 40 pounds per acre. Table 1 indicates that a 7-bushel to the acre increase in yield could be obtained from the application of 40 pounds of nitrogen fertilizer. Phosphorus is applied at 20 pounds P_2O_5 per acre or according to soil test recommendations.

Calculations:

A. Cost of fertilizer per acre

40 lb N @ 9¢	= $3.60
20 lb P_2O_5 @ 9¢	= 1.80
	$5.40
Net return per acre	.20
	$5.60

Expected return on fertilizer investment per acre

7 bu @ 80¢/bu	= $5.60
	$5.60

B. Cost of fertilizer per acre

40 lb N @ 8¢	= $3.20
20 lb P_2O_5 @ 8¢	= 1.60
	$4.80
Net return per acre	1.50
	$6.30

Expected return on fertilizer investment per acre

7 bu @ 90¢/bu	= $6.30
	$6.30

The expected yield response is an average for north-eastern Saskatchewan and the response may be more or less depending on soil type, moisture, disease, insect and weed competition.

Expected Yield Increase of Conquest Barley From the Application of N Fertilizer in Relation to to the Soil Test for Nitrogen.

Fertilizer[2] rate lb N/acre	Soil Test[1] (lb N/acre)							
	10	20	30	40	50	60	70	80
	- yield increase of Conquest Barley (bu/acre)							
0	0	0	0	0	0	0	0	0
20	17	8	6	5	4	3	2	0
40	32	15	9	7	6	4	3	0
60	43	25	18	14	10	6	4	0
120	58	33	21	17	13	8	4	0

[1] Soil was sampled in the spring. Soils sampled in the fall should add 15 lb to the soil test (except for Etomami clay soil).

[2] Additional phosphorus fertilizer added according to soil test recommendations.