

## The Response of Grain Crops to Fertilizer Application with Various Cropping Practices, Melfort, 1967

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On a grass legume sod fallow, that by soil test was very high in N and very low in P, 11-48-0 at 63 lb/acre gave a significant increase in yield with oats and barley at Melfort in 1967. No fertilizer tested significantly increased the yield of flax, wheat or Target rapeseed but a 30-30 treatment produced the highest yield and was significantly better than the check treatment with Echo rapeseed.

On wheat stubble land where the soil test indicated that the available nitrogen was low (22 lb/acre) and the phosphorus was very low (12 lb/acre) a fertilizer treatment containing 40 lb of N and 40 lb of  $P_2O_5$  significantly increased the yield over a fertilizer treatment containing 10 lb of N and 40 lb of  $P_2O_5$  with oats and barley but not with wheat in 1967. In this study, six different methods of seeding were compared with each crop. The interaction of seeding method and fertilizer treatment was not significant with any of the crops. The highest average yields were produced by discer seeding or seeding with the double disc press drill following preseeding tillage with discer and harrows with all crops in 1967. However, several of the seeding methods produced yields that were not significantly different from these treatments with any crop in 1967.

On wheat stubble where the soil test indicated that the available nitrogen was very high (84 lb/acre) and the phosphorus was high (44 lb/acre) a comparison of the recommended fertilizer application from the soil test (11-48-0 @ 40 lb/acre) compared to a treatment of 40 lb of nitrogen and 20 lb of  $P_2O_5$  resulted in a significant reduction in yield from the higher nitrogen fertilizer with a number of methods of handling the stubble.

The highest average yields have been obtained from plots that had a light fall tillage although the difference in yield between many of the treatments is small and probably non significant. In another experiment, after 13 years of continuous cropping to wheat, the weed infestation is less severe on plots that have been given a light fall tillage each year. In this study, the best fertilizer treatment 20-20 produced a yield increase over the check of about 50 lb of wheat/acre in 1967 compared to the 13 year average increase of 221 lb/acre.

In crop rotation studies yield differences from fertilized and unfertilized rotations were small at Melfort and Parkside in 1967. The increase from fertilizer ranged from 40% in a continuous wheat rotation where the soil test showed the available nutrients to be very low to less than 10% in other rotations where the nutrients were in the medium to high range at Melfort.

At Parkside the increase in yield of wheat from fertilizer was about 10% on fallow and stubble and about 30% on hay crops in the rotation.