

Oats are frequently considered relatively unresponsive to fertilizer applications; however, the crop is known to be an excellent scavenger of residual soil nutrients. Under high yielding conditions, oats can take up a large amount of nitrogen (N), and there is increased potential for other important nutrients to become limiting. Thus, many producers are opting for full and balanced fertility as a way of enhancing grain yield and quality of oats, while also maintaining soil quality in the long-term.

Research has shown that oat response to phosphorus (P) fertilizer application can be inconsistent, though oats can remove quite a bit of P which must be returned to maintain soil quality. Potassium (K) is rarely considered limiting in Saskatchewan soils and documented oat responses to this nutrient have been limited.

This study was conducted at Indian Head in 2014. The treatments compared were twelve different combinations of applied rates of N, P, and K fertilizer. The N rates were 49 and 103 lb N per ac, the P rates were 0, 18, and 36 lb P<sub>2</sub>O<sub>5</sub> per ac, and the K rates were 0 and 27 lb K<sub>2</sub>O per ac. Soil residual N and P at this locations were low, while K was high.

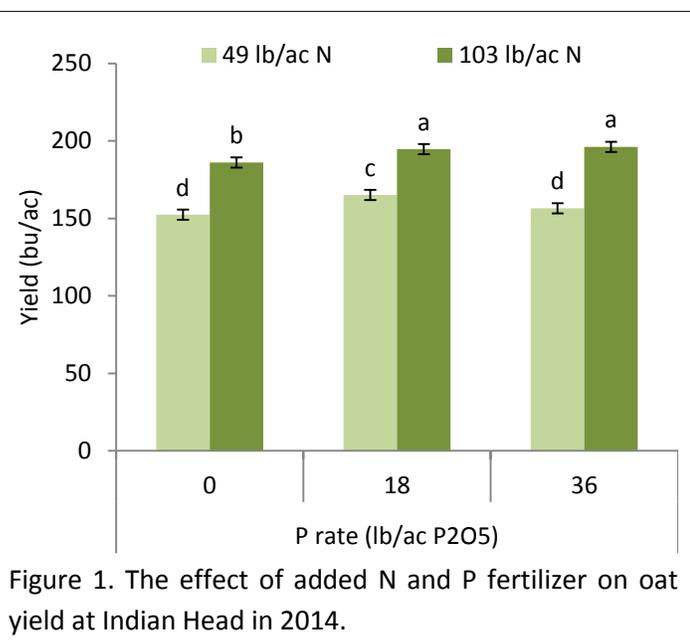


Figure 1. The effect of added N and P fertilizer on oat yield at Indian Head in 2014.

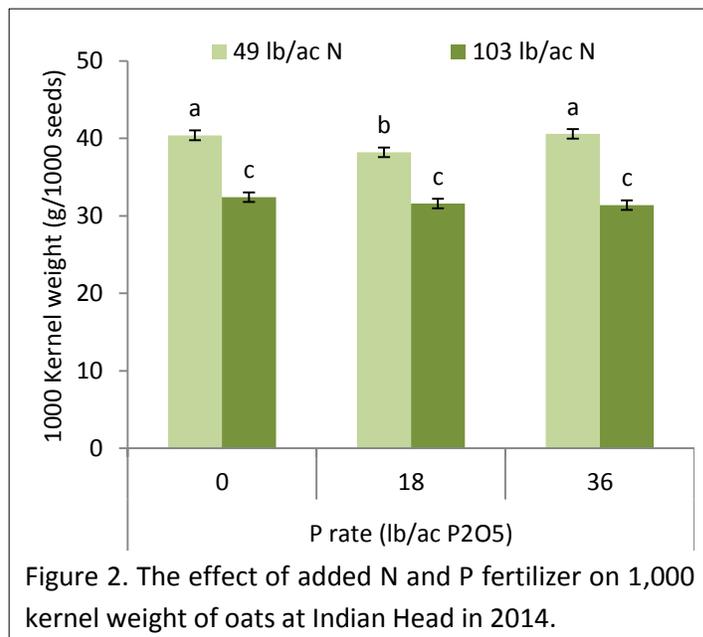


Figure 2. The effect of added N and P fertilizer on 1,000 kernel weight of oats at Indian Head in 2014.

The oats were responsive to both N and P fertilization. Yield was increased by 20% when the N rate was increased to the higher rate, and by an additional 4% with P fertilization. There was no significant yield benefit going from 18 to 36 lb/ac P<sub>2</sub>O<sub>5</sub>, even at the higher rate of applied N.

Quality declined with higher N rates; both test weight and seed size were lower at the higher rate of N. However, test weight increased significantly with P fertilization (not shown).

K fertilizer had no significant effect on grain yield or any measure of grain quality.

This study indicates that the optimal N rate is likely to be higher than 49 lb/ac N under high yielding conditions, and that yield increases with P fertilization are likely when residual P is low. Soil testing is a useful tool to predict whether higher than usual N rates are required and whether P fertilization is likely to increase yield; however, growers should be cautious with N applications on oats to minimize the impact on grain quality.

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