

While specialty crops such as quinoa are unlikely to be a fit for all commercial grain operations in Saskatchewan, many producers are quite receptive to profitable, alternative cropping options and seek to diversify their crop rotations. Most of the quinoa production in western Canada is under contract and the total acreage is unclear; however, the largest producer of this crop in North America (Northern Quinoa Production Corporation, NorQuin) is based in Saskatoon and much of the value adding and distribution of this crop occurs right here in Saskatchewan. Published research on quinoa response to N fertility is limited; however, several agronomists and research groups in the province have gained limited experience with this crop over the past several years.

The objective of this project was to gain experience with and information on the overall productivity and adaptation of quinoa to increasing nitrogen (N) fertilizer rates. Field demonstration with quinoa was established at Indian Head in 2022. The treatments were five N fertility levels: 60, 100, 140, 180, and 220 kg N/ha (soil plus fertilizer). The N sources included monoammonium phosphate (11-52-0), ammonium sulphate (21-0-0-24), and urea (46-0-0). Monoammonium phosphate, ammonium sulphate, and potash rates were held constant across all treatments to provide 28-40-20-20 kg N-P₂O₅-K₂O-S/ha, while the rate of urea was adjusted as required to achieve the target N rates.

Quinoa plant emergence was excellent with mean plant densities of 143-180 plant/m². Despite this range, no differences between treatments were significant and there were no trends in terms of an N rate effect. Plant height increased quadratically from 110 cm at 60 kg N/ha to 146-149 cm at 180-220 kg N/ha (Figure 1). The quinoa yields followed a similar trend to height, peaking at 180 kg N/ha but starting to level off at approximately 140 kg N/ha (Figure 2). The top yield was 2134 kg/ha at 180 kg N/ha compared to 1233 kg/ha at 60 kg N/ha, an increase of 788 kg/ha or 64%. In conclusion, these results show

promise for quinoa in the thin-black soil zone; however, producers should recognize that the yields reported are likely above average for the region and should research potential challenges with this crop prior to committing to growing them on a commercial scale.

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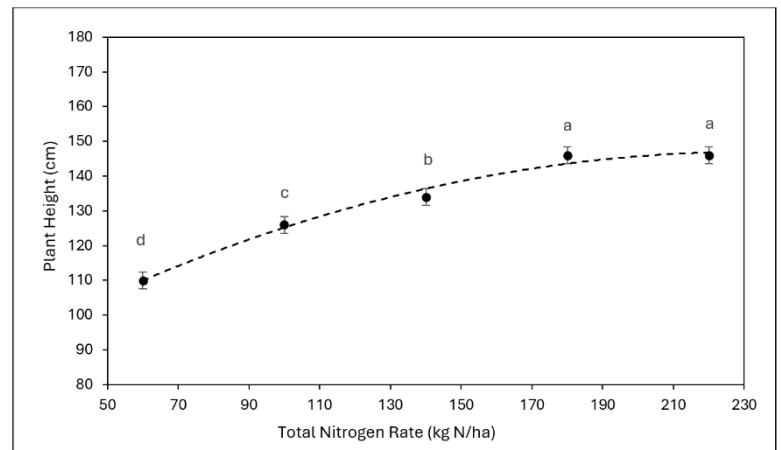


Figure 1. Side-banded N rate effects on quinoa plant height at Indian Head in 2022.

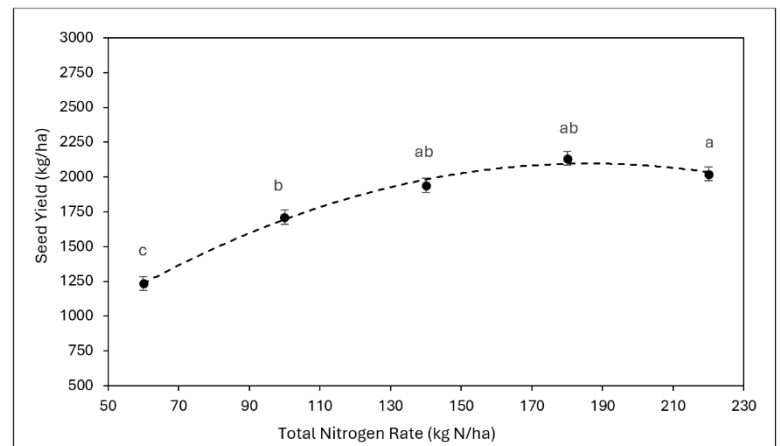


Figure 2. Side-banded N rate effects on quinoa seed yield at Indian Head in 2022.