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## EFFECT OF PLANT POPULATION IN GREAT NORTHERN AND PINTO BEAN PRODUCTION IN WESTERN NEBRASKA

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### INTRODUCTION

In this project we explored the effect of plant population and row spacing on the yield and quality of great northern and pinto beans grown in Nebraska. This project builds on the findings from a preliminary non-replicated great northern variety trial conducted at Morrill, NE in 2014. That trial included four great northern cultivars with different plant architecture. In general, yields were reduced 18.8% (795 kg ha<sup>-1</sup>) when plant population increased from 251,152 to 300,715 plants ha<sup>-1</sup>. Yield reduction was greatest in ‘6107’ (24.7%) followed by ‘Marquis’ (20.1%), ‘Beryl-R’ (15.5%) and ‘Coyne’ (14.0%). In the current project we used replicated trials to evaluate the impact of plant population on two great northern and two pinto bean cultivars. Within each market class, one cultivar had a prostrate (III) and the other had an upright (II) growth habit. Our goal was to identify the optimal plant population and row spacing for each cultivar.

### MATERIALS AND METHODS

This study was conducted during 2015 at the PREC-Scottsbluff, NE. Two great northern, ‘Marquis’ (III) and ‘Draco’ (II), and two pinto cultivars, Montrose (III) and Sinaloa (II) were planted in separate experiments at two row spacing (15 and 30 inches) and four plant populations. Target populations for the 30-inch row spacing were 45,000, 80,000, 100,000, and 120,000 plants/acre. Target populations for the 15-inch row spacing were 80,000, 100,000, 120,000, and 150,000 plants/acre. Four and seven rows were planted for the 30- and 15-inch row spacing experiments, respectively.

### RESULTS AND DISCUSSION

- Target and actual plant populations were similar.
- Within each market class, yield differed significantly among cultivars at both 15- and 30-inch row spacing.
- Plants matured significantly earlier under high plant populations (generally 1 day earlier).
- 100-seed weight was reduced by 8% for both pinto cultivars at high plant populations.
- At the 15-inch row spacing, cultivars with growth habit III (Montrose and Marquis) reached their highest yield at a plant population of 100,000 plants/acre, however yield decreased at a plant population of 150,000 plants/acre.
- In general, dry beans planted at the 15-inch row spacing had higher yields than those planted at the 30-inch row spacing

### CONCLUSIONS

- These results are insufficient to identify the optimal plant population and row spacing combination for these great northern and pinto cultivars.
- Growing conditions were atypical during 2015, therefore, this study will be repeated in 2016 and 2017.

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