Canada-Saskatchewan
Irrigation
Diversification
Centre

Nitrogen Management of CDC Pintium

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The Question

Proper nitrogen management is important for optimizing dry bean yield. There is considerable variability in N fixation in dry bean cultivars with different growth habits. As a result, requirement for nitrogen fertilization application can be cultivar dependent.

This project's objective was to determine the effect of nitrogen fertilizer and granular inoculant application on CDC Pintium pinto bean yield during seed multiplication under irrigated conditions.

Introduction

CDC Pintium pinto bean is a newer high yielding, early maturing, type I upright dry bean variety suitable for Saskatchewan's short growing season.

Producing quality seed of this variety under irrigated conditions requires identifying production practices that optimizes yield of quality seed.

Optimizing dry bean yield requires the proper balance between nitrogen fertilizer application and N fixation (Kerr, 1972; Westermann et al., 1981). Dry bean yield components (yield/ plant, pods/plant, seed size) have been shown to respond to nitrogen fertilizer application (Edje et al., 1975).

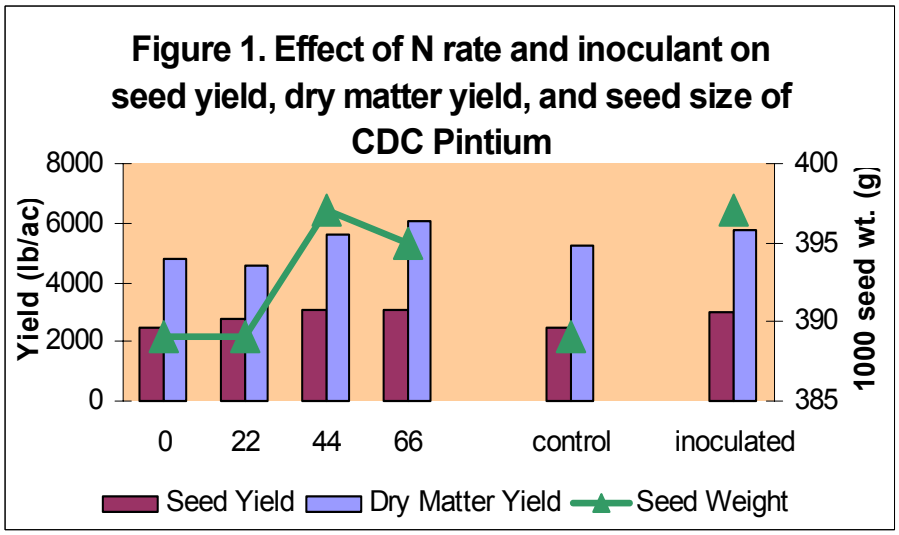
Considerable variability in beans' N fixation has been reported with type IV (indeterminate, climbing) plants fixing more than type I plants that have a determinate, upright growth habit (Graham, 1981). Later maturing bean types have been found superior to earlier maturing types for both total end of season N fixed and N-accumulation rate (Piha and Munns, 1987). Individual varieties have also been shown to respond differently to N fertilizer (Westermann et al., 1981).

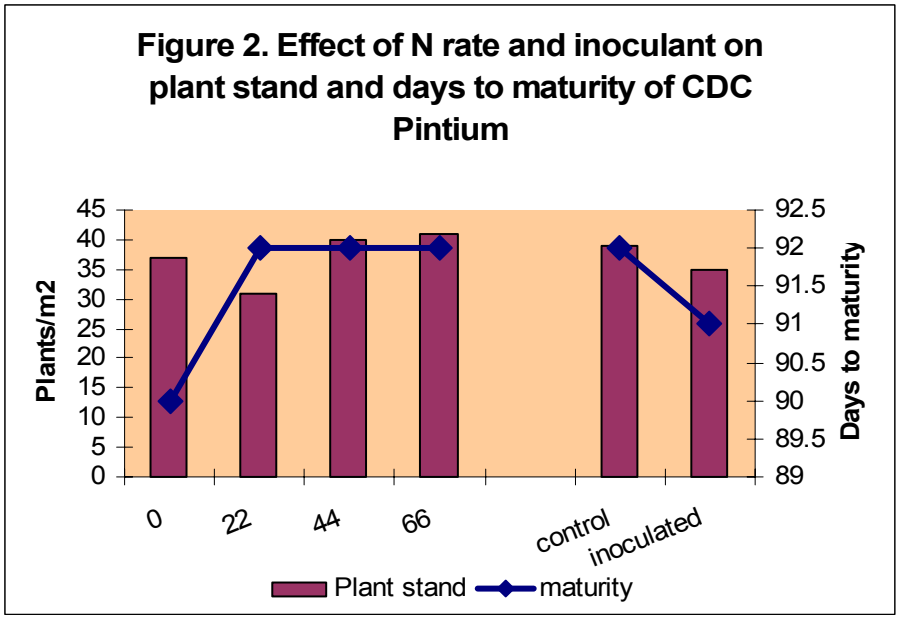
Results

A significant dry matter and seed yield (Figure 1) response to applied starter nitrogen was observed. Dry matter and seed yield increased with each 22 lbs N/acre increment up to 44 lbs N/ acre and showed a significant response to inoculant application. Adding nitrogen and inoculant produced healthier and greener plant growth. No effects of the nitrogen or inoculant treatment on days to 10% flower was observed; however, nitrogen applications delayed maturity one to two days (Figure 2).

Inoculant application produced a higher seed weight compared to the control treatment (Figure 1). Starter nitrogen treatments had no significant effect on seed weight even though seed weight showed a trend of increasing with an increase in applied nitrogen.

This trial's results indicate that newer dry bean cultivars, such as CDC Pintium, may require higher quantities of nitrogen fertilizer to produce maximum seed yield than quantities currently recommended by soil test guidelines. Recent work in southern Alberta with irrigated dry bean also showed a response to nitrogen fertilizer applications but did not show a response to inoculant application (McKenzie et al., 2001).





The Study Details

Location:	CSIDC
Soil Type:	sandy loam - loam
Soil Test:	39 lb NO^3-N/ac (0-24 in)
Seeding rate:	30 plants/m^2
Row spacing:	0 cm
Fertilizer:	40 lb/ac 12-51-0 side-banded
Inoculant:	6 lb/ac granular
Weed Control:	Ethylfluralin (Edge) pre-plant incorporated; Bentazon (Basagran); Sethoxydim (Poast) applied post-emergence
Disease control:	Benomyl (Benlate) 10% flower + 7 days later

Treatments:
N rate: 0, 22, 44, and 66 lb actual N/ac as side-banded 46-0-0

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