

2014 Processing Snap Bean Nitrogen Trial

Steve Reiners
Associate Professor
Horticulture, NYSAES
Cornell University
Geneva, NY 14456

sr43@cornell.edu
315-787-2311

James Ballerstein
Program Support Specialist
Horticulture, NYSAES
Cornell University
Geneva, NY 14456

jwb2@cornell.edu
315-787-2223

Four snap bean varieties were evaluated for their response to increased levels of applied nitrogen. Huntington, BA1001, Pismo, and SV1136 were planted on June 20 at Cornell University's New York State Agricultural Experiment Station. The soil type is a silt loam with approximately 2.5% soil organic matter. Seeds were planted at 6 to 8 per foot of row and rows spaced on 30 inch centers. Plot length was 27 feet long and all treatments replicated five times. At planting, 180 pounds per acre of a custom made 0-21-21 fertilizer was banded to meet the phosphorus and potassium needs of the beans, as recommended by a pre-season soil test. Nitrogen in the form of urea was applied to plots at rates of 0, 40, 80 and 120 pounds of N per acre on July 11, approximately three weeks after planting. In an effort to reduce residual soil nitrogen prior to planting, a cereal rye cover crop in the field was killed at about two feet tall, mowed, raked and removed from the field.

Five feet of row was harvested from each plot when seed length in 4 sieve beans was approximately 90 mm. Number of plants, weight of plants and pods together, weight of pods and seed size was recorded. With the exception of SV1136, all varieties showed a large and significant increase in tons per acre as rates rose from 0 to 40 pounds of N/Acre (Table 1). This is an indication that efforts to reduce residual soil N were somewhat effective. The objective of this study, however, was to determine if the varieties would respond to even higher rates. Two apparently did (Figure 1). Huntington tons per acre was highest at 80 pounds N/Acre, with 7.1 tons. Increasing the rate to 120 pounds of N/acre did not result in an increase. Pismo, however, saw yields continue to rise as rates increased even up to 120 pounds of N/Acre. BA1001 and SV1136 did not respond to rates higher than 40 pounds of N/acre.

Table 1. Increase in yield (tons/A) as nitrogen levels increased from 0- 40, 40-80, and 80-120 pounds of N/A.

Incremental Yield increase (tons/acre)

N Rate Increase (lbs/acre)	Huntington	BA1001	Pismo	SV1136
0-40	1.47	1.44	1.48	0.34
40-80	1.27	-0.40	0.67	-0.10
80-120	-0.83	0.23	0.57	0.28

Total above ground weight of leaves and stems showed similar results, although Pismo seemed to show a higher % of weight going towards pod as compared to leaves and stem

(Figure 2). Close to 55% of the total above ground weight at higher nitrogen treatments was attributed to pod weight. No other variety exceeded 50.5% at the higher N levels.

The study indicated that some bean varieties may respond to levels two to three times higher than what is currently recommended. These effects may be more apparent with beans grown on sandier soils that are less likely to hold residual soil nitrogen. In addition, nitrogen treatments were applied as a sidedress in this study, three weeks after planting. Application of nitrogen at the time of planting may be more effective.

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Figure 2. Total tons per acre of total above ground biomass, beans, shoots and leaves

