

Rotational Crops Effects on Potato Production the the Red River Valley

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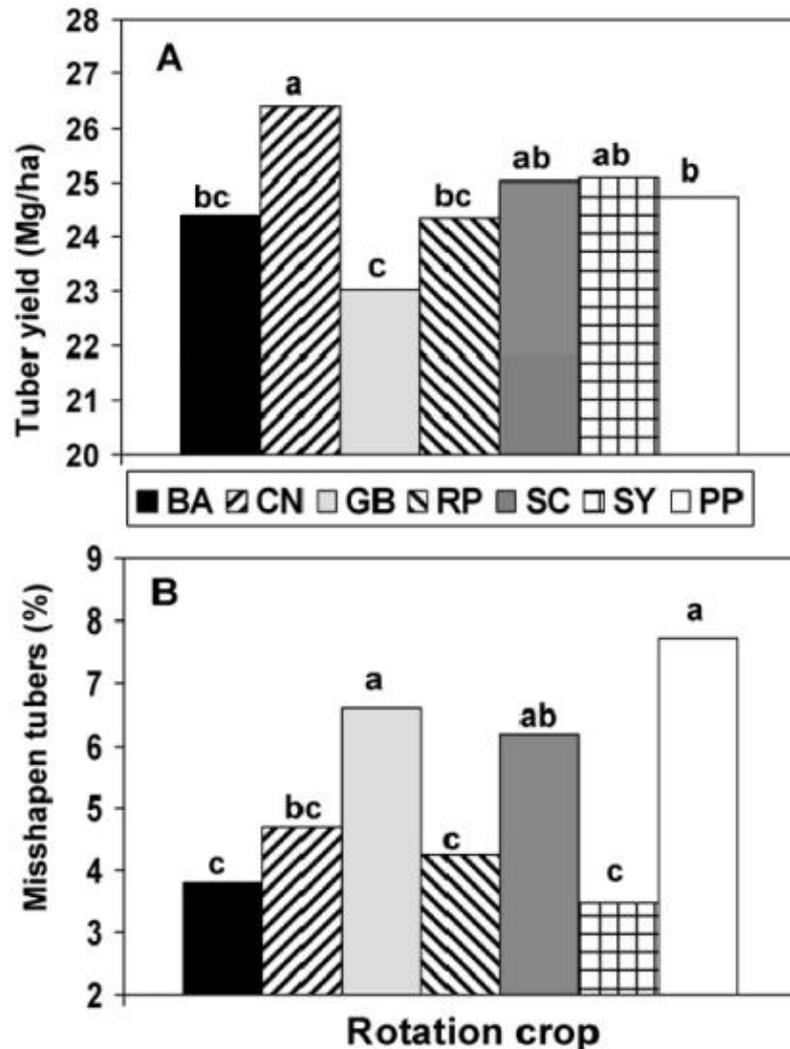
Potato production background

- 200+ years of potato production in RRV
- 82,000 acres of potatoes produced in ND annually
- 50,000 acres of potato are grown in the RRV
 - Chip, seed, and fresh
- Average yield estimated at 340 cwt/a in 2015



Canola in rotation with potato

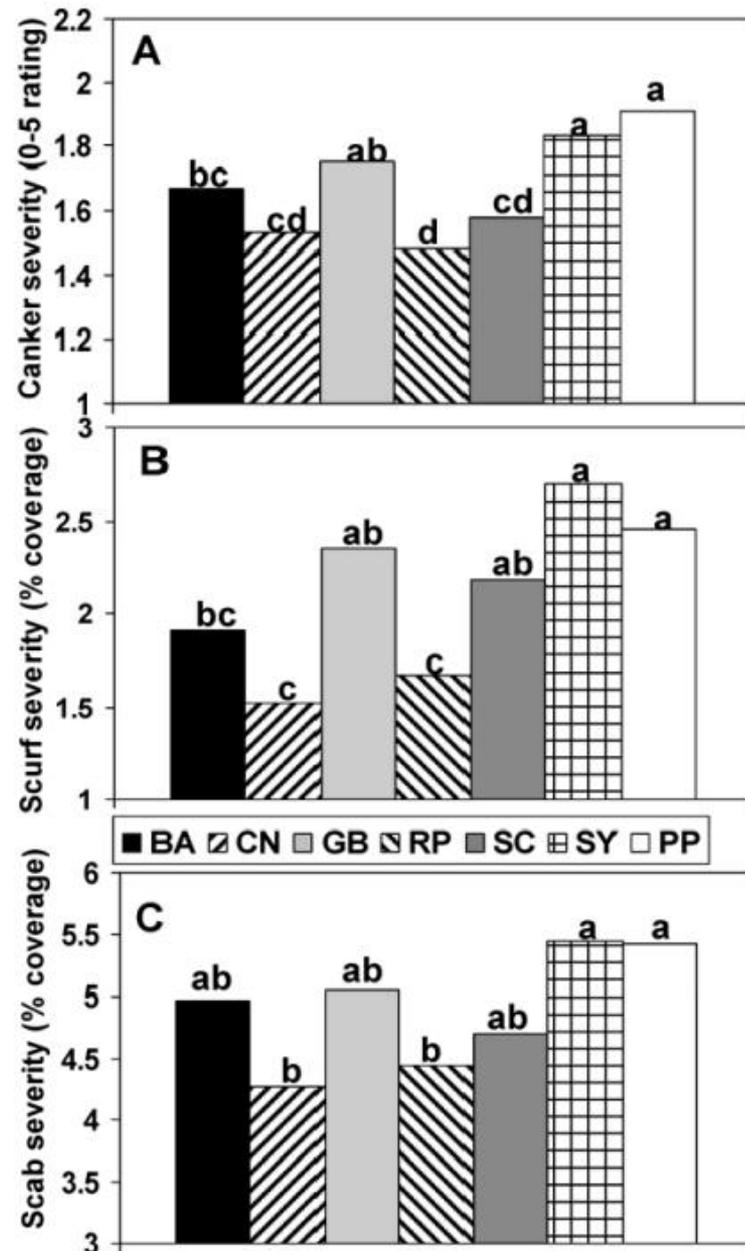
- Study in Newport, ME from 1997-2006 had 7 2-year rotations on a sandy loam.
- Fields were chisel plowed in the spring, then disked twice.
- Potatoes yield better with canola the prior year
 - 14.7% higher than green bean
 - 8.2% higher than barley/clover



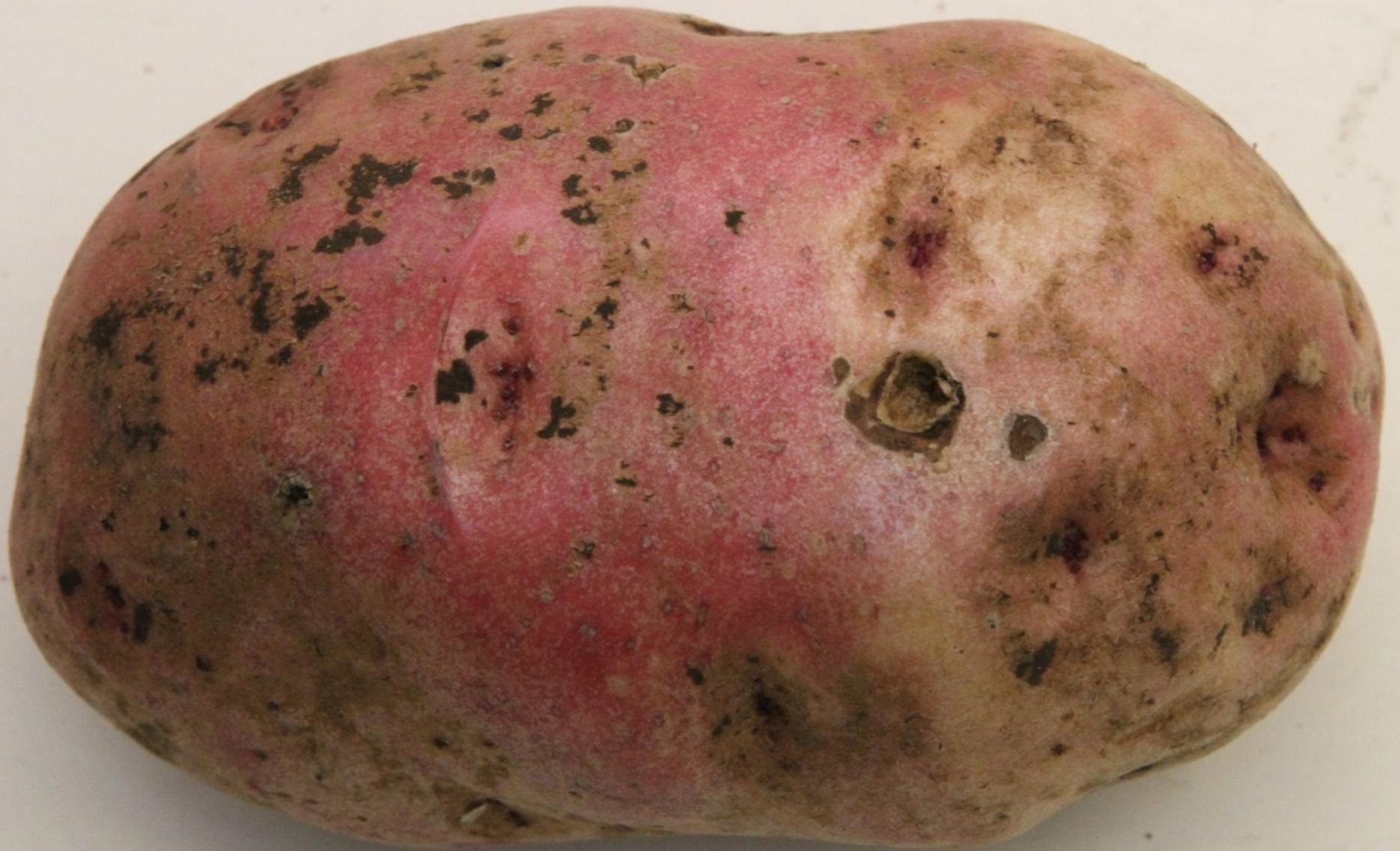
BA=barley, CN=canola, GB=Green bean, RP=millet/rapeseed, SC=sweet corn, SY=soybean, PP=potato-potato

Canola in rotation with potato

- Canola in rotation with potato had a 18-38% reduction of *Rhizoctonia* canker, black scurf, and common scab.



Rotation crop (Larkin et al., 2010)



Red River Valley study

- 1961-1963 study in Grand Forks, ND.
- Yield response of Pontiac potato was good with no tillage, and better than plowing.
- Clod weight was not consistent.
- Challenges: debris when planting, weed control

| Treatment | Yield (3 year average) | |
|-------------------|------------------------|----|
| No tillage | 163 | a |
| Deep till, fall | 155 | ab |
| Plow, fall | 150 | b |
| Deep till, spring | 156 | ab |
| Plow, spring | 139 | c |

(French and Blake, 1966)

Challenges in production

- Dirt clods
 - Cause bruising, skinning, extra weigh to haul
 - Leads to increased fuel costs and entry of diseases in tubers.
- Potato diseases seem to be increasing
- Fresh potatoes: People Buy with Their Eyes
- Push for sustainable crop production





WARNING
MOVING PART HAZARD

TIE
STRO



Purpose of the study

- Determine the effects of the previous crop (dry edible bean, canola, or wheat) on potato quality and yield.



What was done

- Location
 - Grand Forks, ND (2015 & 2016)
 - RCBD with 4 replicates
 - 3 crops: canola (RR), navy bean, spring wheat. Two tillage types: minimal till and fall chisel plow
 - Potatoes planted following crops (2016)



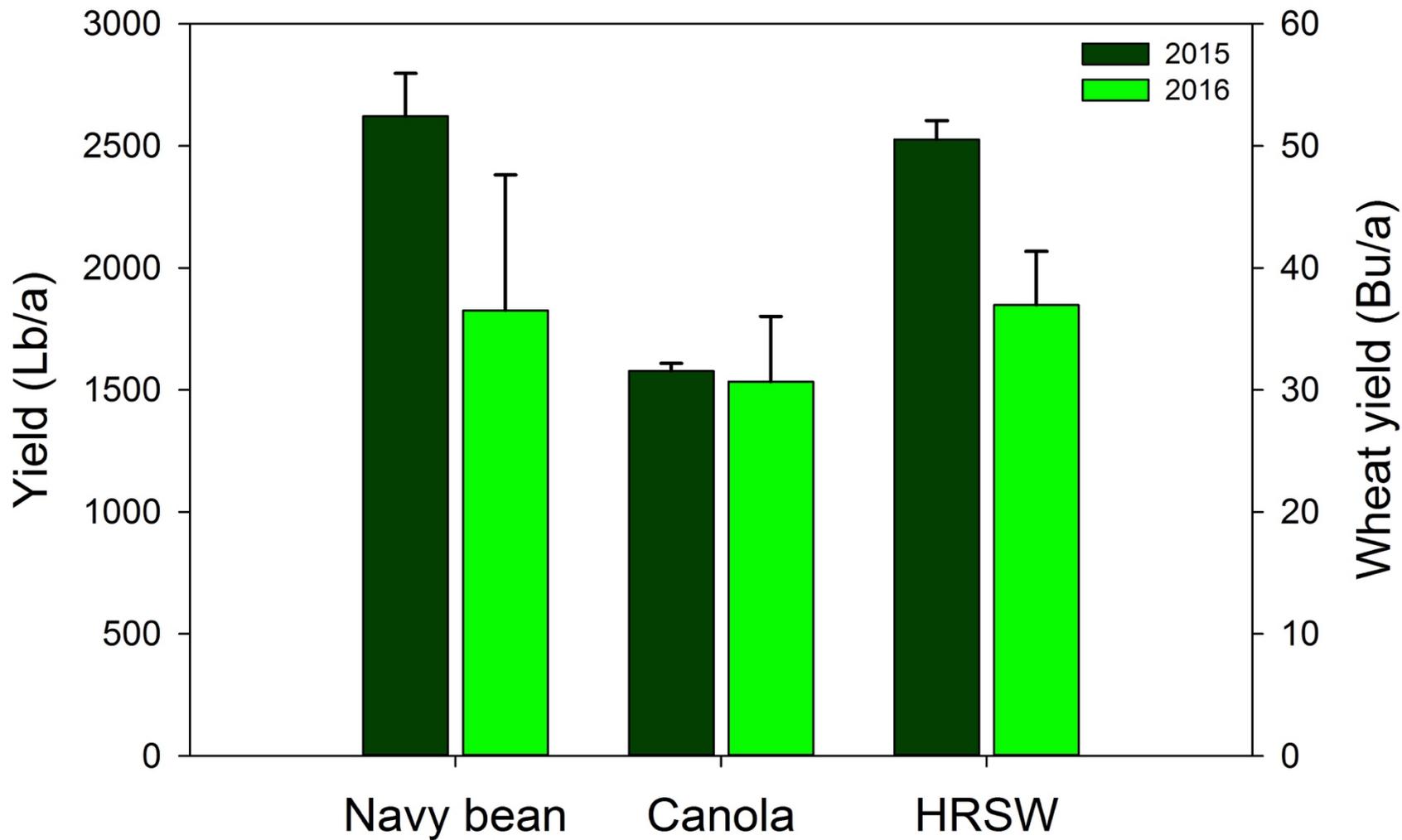


Rotational crops

- Plots
 - 10 x 40 ft
- Seeded
 - May 26, 2015
 - May 8, 2016
- Harvested
 - Sept 9, 2015
 - Aug 19, 2016



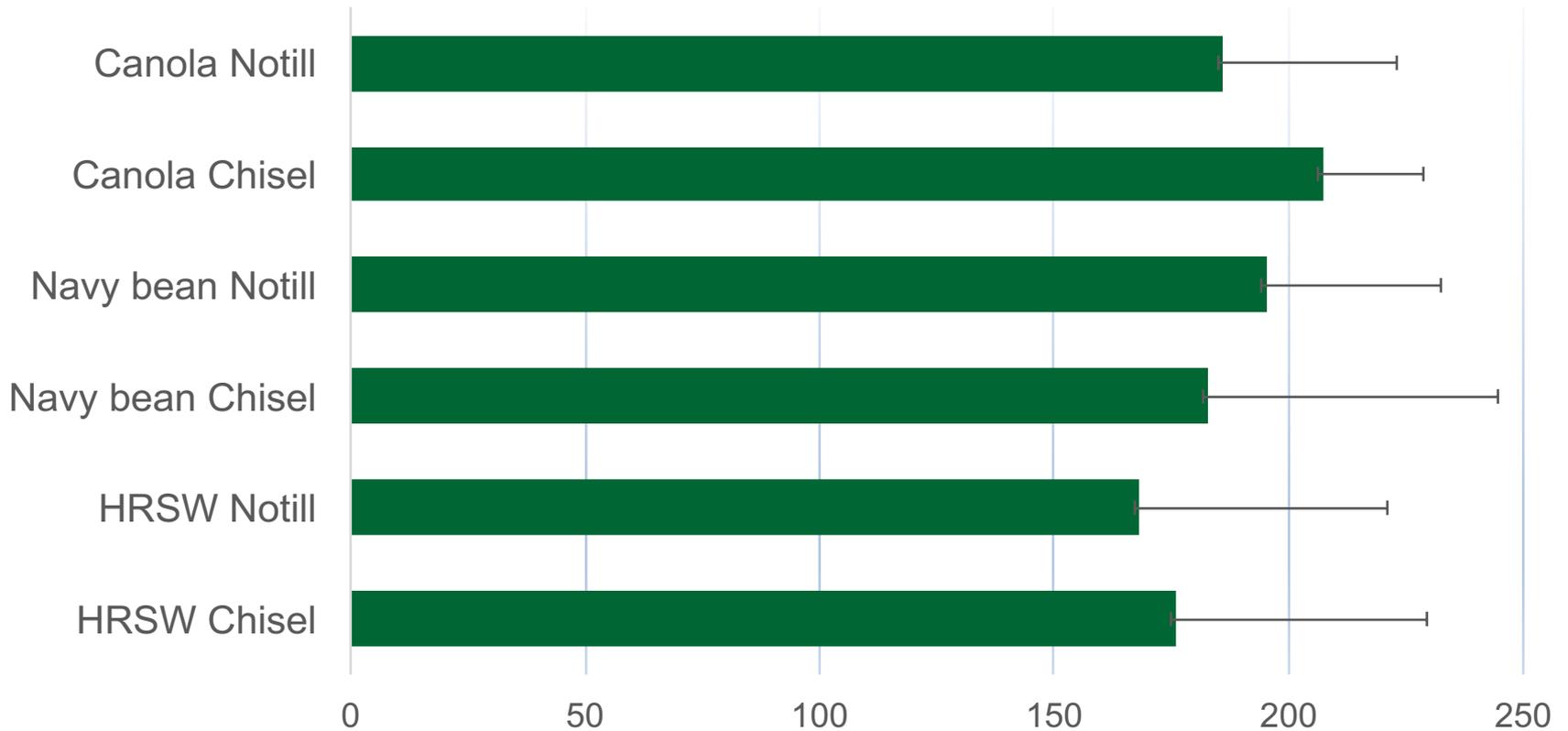
Rotational crop yield results





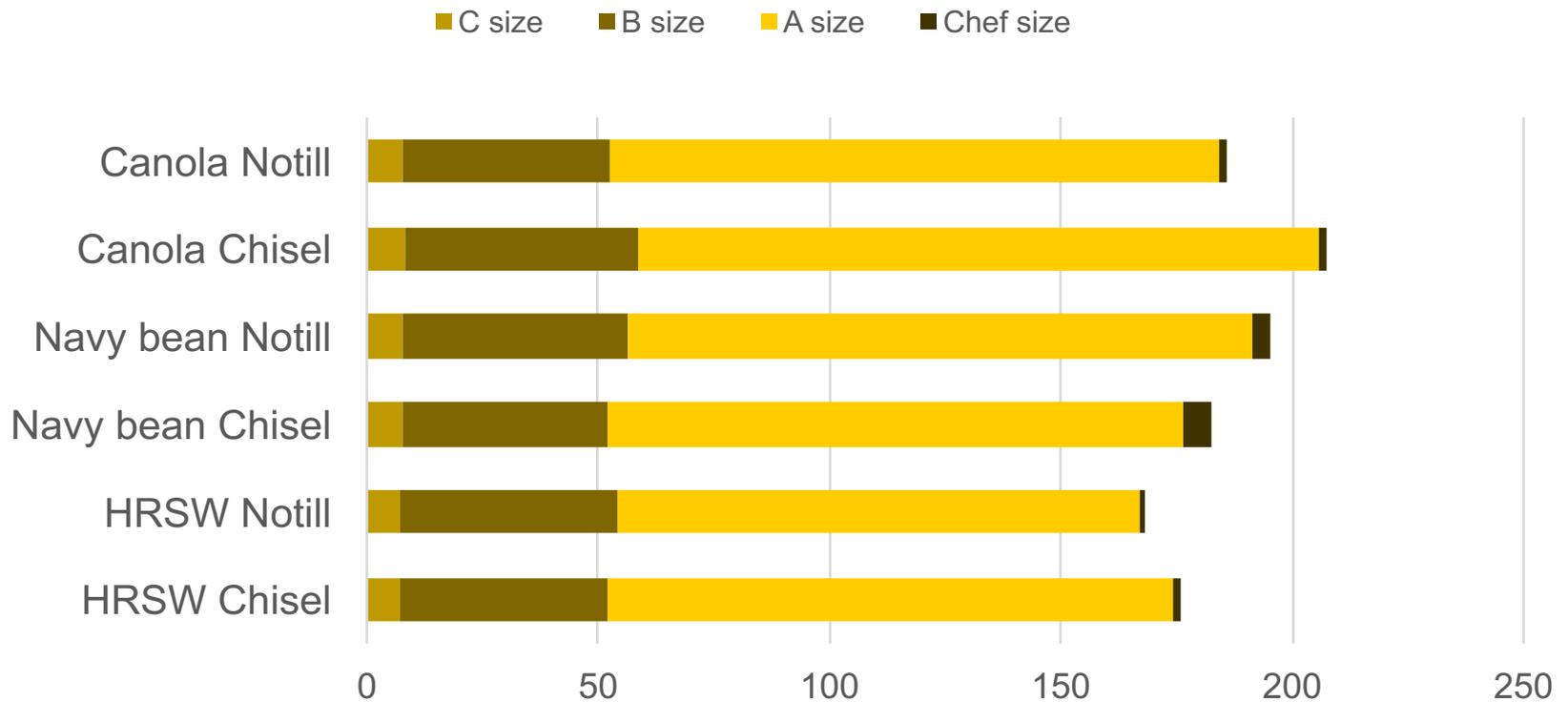
Potato Results

Potato total yield (cwt/a) after rotational crops.



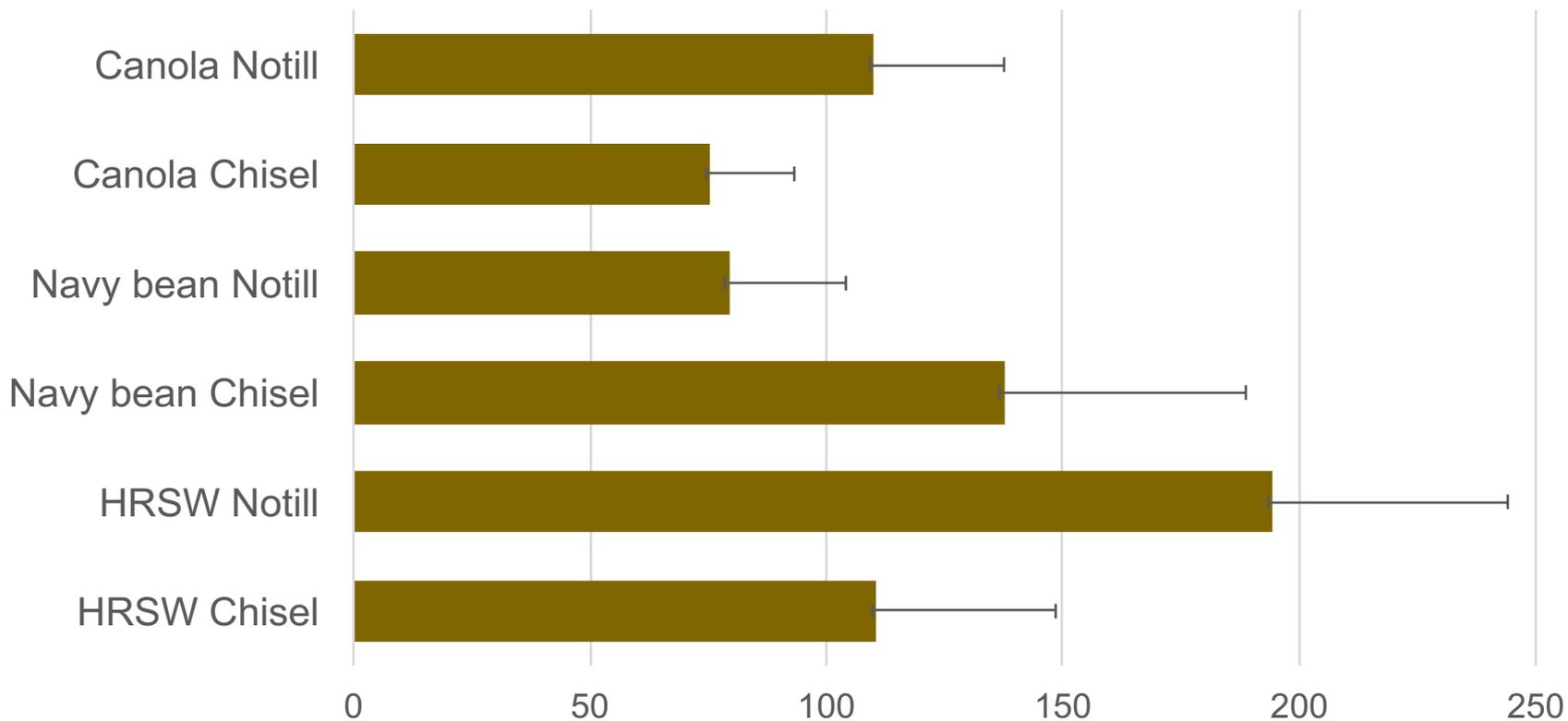
Graded yield of potatoes

Graded potato yield (cwt/a) following rotational crops.



Dirt clod weight by treatment

Dirt clod weight (cwt/a) by treatment.



Results of potatoes from 2016

- No difference between
 - Dirt clod weight
 - Potato yield
 - Tillage types
 - Potato cultivars
- Evaluation ongoing for tuber blemishes

Summary of work

- Numerically, potatoes following canola tended to have the higher yields.
- The 2016 year had more variability.
- Further years of work may better define effects of previous crop on potato.

Future Work

- Start a 3rd year of rotational crop study.
- Seek funding from the NPPGA for potato crop to follow 2016 plots.
 - Measure marketable yield, external blemishes, and clod weight.



Thank you

- Northern Canola Growers Association
- Northern Plains Potato Growers Association

Questions?

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