2018 Dry Bean Projects

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Yield Response of Dry Beans to Variable Rate Seeding

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CANADIAN AGRICULTURAL PARTNERSHIP

ONTARIO Bean GROWERS

AAC agricultural adaptation council

Ontario

Canada

Yield Response of Dry Beans to Variable Rate Seeding

- Yield response across a range of seeding rates
- Yield map for large seeded beans using new yield monitor

Can we…

- Reduce input by lowering seeding rates in highly productive zones of a field?
- Does variable rate seeding improve economic returns?
- Reduce risk of white mould by lowering populations?

Methods: Enhanced Learning Blocks

- Premier Crop Systems
- Significant support from Greg Kitching

- $12/ac to develop seeding rate prescriptions
- Manage and house the data

Methods: On Farm Research

White Beans

- 3 farm fields
- 100 acres each
- Seeding rates (seeds/ac)

44,000	77,000
110,000	120,000

Cranberry Beans

- 3 farm fields
- 100 acres each
- 4 seeding rates (seeds/ac)

30,000	52,500
68,000	82,500

- 2 farmers purchase new yield monitor for Pickett

- Blanket rates of all other crop inputs

Methods: Create Management Zones

2 or 3 Zones representing the range of productivity

Based on:

- Historical yield
- Soil data layer
- Conversation with farmer

Methods: Seeding Rate Prescription including Learning Blocks

One Learning Block within each Management Zone.

15 reps of each seeding rate.

Each plot is ~0.66 ac

Plug into the farmer's planter.

Methods: On Farm Research

- Field work carried out entirely by the growers, using their own equipment
- Each grower has a different planter
  different displays and software
  different level of experience with variable rate

Data Collection

- ‘as applied’ seeding rates
- elevation
- Drone imagery (NDVI)
- Soil Optix – pH, CEC, OM, texture, P, K…
- Yield

- Population, emergence
- Canopy cover
- Lodging
- White mould
- Pods per plant

How Fast Does the Planter Change?

Populations and Emergence: White Beans
Example from one field, one year

	Target Seeding Rate (seeds/ac)			
Zone	**44000**	**77000**	**110000**	**120000**
High Productivity				
As Applied Seeding Rate	47452	79521	107030	120615
Population (plants/ac)	38250	63250	89000	102750
Mid Productivity				
As Applied Seeding Rate	45919	80577	110008	120628
Population (plants/ac)	34250	56250	87750	104500
Low Productivity				
As Applied Seeding Rate	44770	79319	110336	120587
Population (plants/ac)	24000	65750	86000	93500

Populations and Emergence: White Beans Example from one field, one year

	Target Seeding Rate (seeds/ac)			
Zone	**44000**	**77000**	**110000**	**120000**
High Productivity				
% Emergence	81	80	83	85
Mid Productivity				
% Emergence	75	70	80	87
Low Productivity				
% Emergence	54	83	78	78

Populations and Emergence: White Beans Example from one field, one year

	Target Seeding Rate (seeds/ac)			
Zone	**44000**	**77000**	**110000**	**120000**
High Productivity				
Yield (lbs/ac)	2400	2520	2580	2580
Mid Productivity				
Yield (lbs/ac)	2280	2520	2580	2580
Low Productivity				
Yield (lbs/ac)	2160	2400	2520	2520

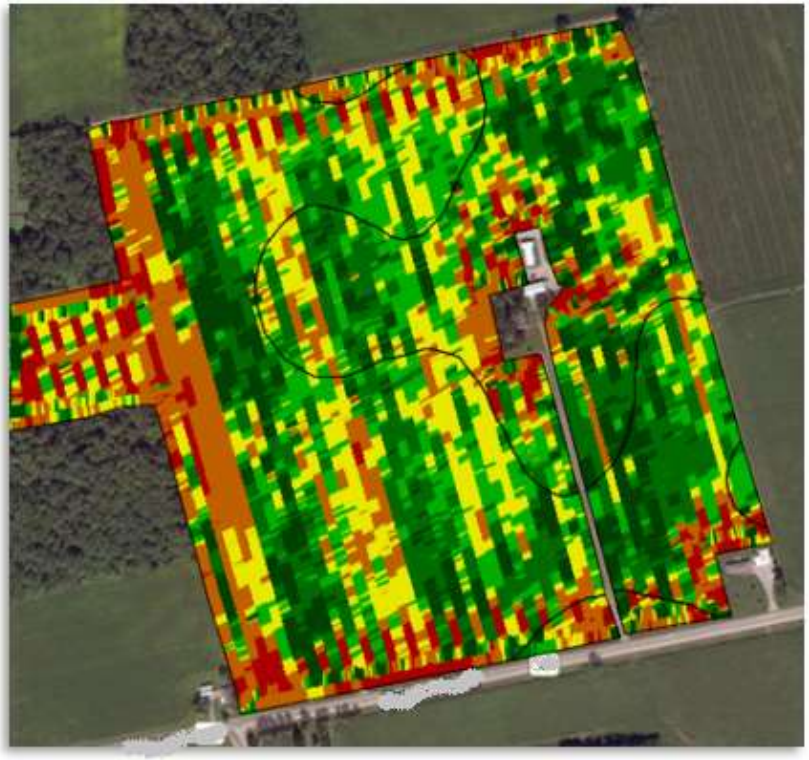
Red squares show most profitable rate in each zone, based on seed cost and bean prices in 2018

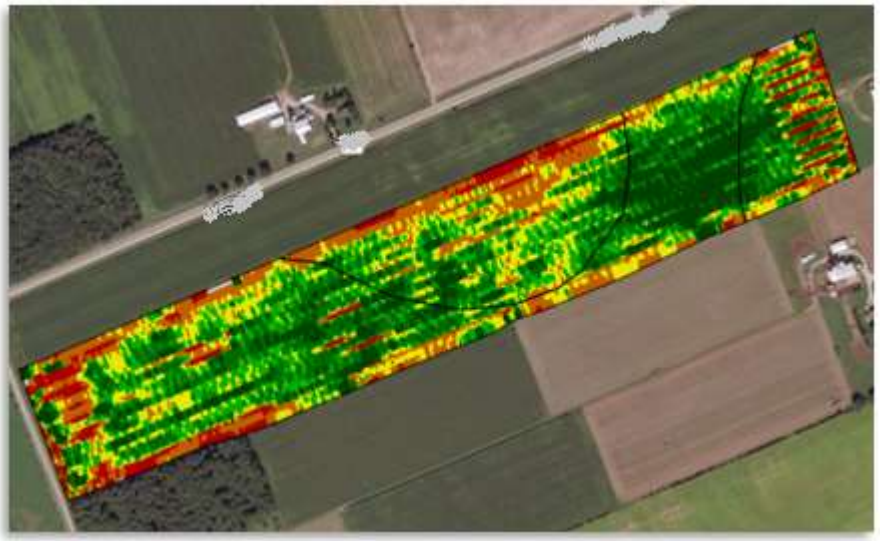
Populations and Emergence: White Beans Example from a second farm

	Target Seeding Rate (seeds/ac)			
Zone	**44000**	**77000**	**110000**	**120000**
High Productivity				
Yield (lbs/ac)	3720	3720	3720	3840
Mid Productivity				
Yield (lbs/ac)	3360	3540	3540	3450
Low Productivity				
Yield (lbs/ac)	3240	3420	3540	(no data)

Red squares show most profitable rate in each zone, based on seed cost and bean prices in 2018

Yield Monitor on Pickett: Cranberry Beans





Big THANK YOU to…

- 5 dry bean growers participating in the project
- Greg Kitching, Premier Equipment

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Provincial Averages from Agricorp	2017 Acres	2017 Yield (lbs/ac)	2018 Acres	2018 Yield (lbs/ac)
White	59,649	2,154	47,633	2,425
Black	12,823	2,030	11,720	2,787
Kidney	13,713	2,264	13,862	2,541
Cranberry	12,904	2,376	13,332	2,622
Adzuki	7,755	1,375	13,337	1,820
Japan/Other	8,911	2,092	7,223	2,181
Coloured Bean Total	56,106		59,474	
Grand Total	115,755		107,107	