Whole Seed vs. Cut Seed

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Whole Seed vs. Cut Seed

- In many other countries (ie. Western Europe), cutting of seed is rare.
- Planting whole seed has a number of advantages:
  - More consistent stem numbers, even plant population and emergence
  - Eliminate the cost of seed cutting
  - Improved barrier against bacterial soft rot/Fusarium
  - Larger seed pieces with improved vigour
  - Biosecurity (Dickeya, brown rot, ring rot, etc)
- Interest in demonstrating under PEI conditions that whole seed would provide **equal or better yields and crop value** than cut seed.

Whole Seed vs. Cut Seed

Whole Seed vs. Cut Seed

- In 2016 and 2017, contracted Genesis Crop Systems to perform plot scale trials at multiple locations to compare performance of whole and cut seed from the same seed lots.
- Some key considerations:
  - Grower seed lots not grown under “small seed” management
  - Stripped out smaller sized tubers, but don’t know why those tubers were necessarily smaller
  - Planted/cut by hand for accuracy
  - “Demonstration Trial” concept for growers, with only 2 reps per treatments per site, but replicated at 3 sites each year.
  - Focused mainly on Russet Burbank

2016 Project Plan

- 3 sites, 3 seed sources, Russet Burbank
- Treatments for each seed source:
  - Cut seed (15 in)
  - Small whole (12 in)
  - Small whole (15 in)
  - Large whole (15 in)
  - Large whole (18 in)
- Small whole seed was sized 1.5 – 2.5 oz
- Large whole seed was sized 2.5 – 4.0 oz
- Average cut seed size 2.3 oz

2016 Project Plan

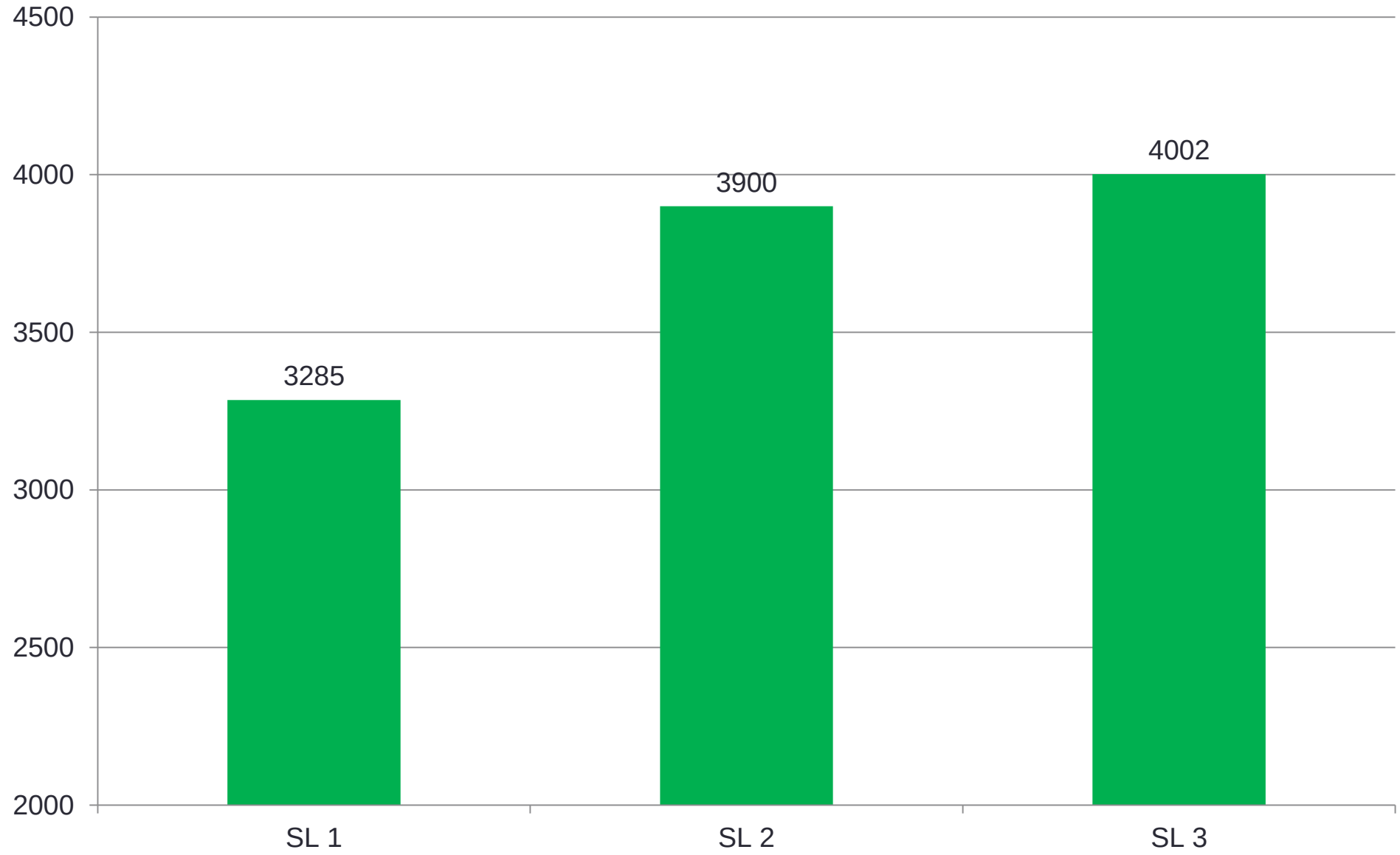
- Conducted in three grower fields. Grower partners provided all in field services – field prep, row forming, fertility, crop protection, etc. Managed as part of the commercial field for fertility and crop protection, but plots hand-planted.
- Locations: Springfield West, Malpeque, Souris
- Springfield West site compromised due to weeds/fertility issues.
- Each treatment combination replicated twice at each location
- Grading by Cavendish Farms Central Grading – established pay weight yields, crop value/acre, etc

2016 Qualifiers

- Crop appearance and yield differences were observed between seed lots, with one lot consistently producing lower yields and revenue than the other two

- Highlights the fact that not all seed lots are equal, and good quality seed is essential, regardless of seed piece size/cutting/planting width.

Comparison of Seed Lot Performance $/acre



2016 Averages across 2 sites

2016	Total Yield cwt/ac	% Defects	% Smalls	% > 10 oz	$/acre
Cut Seed	370	10	10	31	3612
SW12	339	9	18	18	3048
SW15	423	6	15	20	4132
LW15	407	4	15	17	4000
LW18	390	7	16	19	3727

2016 Ave. Difference from Cut Seed Across 2 Sites

2016	Total Yield cwt/ac	% Defects	% Smalls	% > 10 oz	$/acre
Cut Seed	0	0	0	0	0
SW12	20	-3.6	6.3	-12.4	115
SW15	5	-3.3	3.5	-8.0	0
LW15	32	-4.8	6.6	-14.5	194
LW18	25	-2.5	3.0	-7.4	277

2016 Results

- Looking at average difference from Cut Seed, all of the Whole Seed lots performed as good or better than the Cut Seed lot on Total Yield and Payout
- Whole Seed lots produced slightly more smalls, fewer 10 oz, but also fewer total defects (mostly due to shape)
- Specific Gravity values did not vary much across treatments, varied more across sites.

2017 Project Plan

- 3 sites, 5 seed sources, Russet Burbank (2 sites) & Prospect (1 site)
- Treatments: (one source not cut)
  - Cut seed (15 in)
  - Small whole (12 in)
  - Small whole (15 in)
  - Large whole (15 in)
  - Large whole (18 in)
- Small whole seed - 1.5 – 2.5 oz
- Large whole seed - 2.5 – 4.0 oz
- Average cut size – 2.3 oz

2017 Qualifiers

- Saw very few differences at Prospect. This site was under extreme drought stress in 2017
- One of the seed sources was not cut, as it was managed to be a smaller profile. Was used for comparison, but not included in subsequent averages
- Reported averages are across 4 seed lots, 2 replicates per treatment, at two sites for Russet Burbank
- One of the sites had much higher yields across all treatments due to receiving much higher rainfall during the growing season. 1000-1300 cwt/ac difference between two sites.
- Grading by Cavendish Farms Central Grading

2017 Averages across 2 sites

2017	Total Yield cwt/ac	% Defects	% Smalls	% > 10 oz	$/acre
Cut Seed	322	6	17	20	3124
SW12	323	1	32	9	2646
SW15	319	6	14	19	3225
LW15	334	9	23	18	3080
LW18	388	4	27	10	3409

2017 Ave. Difference from Cut Seed Across 2 Sites

2016	Total Yield cwt/ac	% Defects	% Smalls	% > 10 oz	$/acre
Cut Seed	0	0	0	0	0
SW12	19	-1	7	-6	-34
SW15	9	0	1	-3	-55
LW15	38	-1	8	-8	232
LW18	3	-2	3	-3	101

2017 Results

- Smaller sized whole seed produced similar yields and payouts to cut seed.
- Larger sized whole seed produced increased payout to cut seed, more so for the 15 inch spacing.
- Similar to 2016…. whole seed treatments tended to have slightly more smalls, fewer 10 oz and no noticeable effect on specific gravity scores.

Ave. Difference from Cut Seed Across 2 Years

	Total Yield cwt/ac	% Defects	% Smalls	% > 10 oz	$/acre
Cut Seed	0	0	0	0	0
SW12	19	-2	7	-9	41
SW15	7	-2	2	-5	-28
LW15	35	-3	7	-11	213
LW18	14	-2	3	-5	189

Results over Two Years

In comparing average difference from cut seed over two years (4 total sites), whole seed treatments produced:

- The same or better total yield
- Slightly fewer total defects
- 2-7% more small potatoes (under 2 inches)
- 5-11% fewer potatoes > 10 oz
- The same or better total crop value
- The larger sized whole seed (2.5 to 4.0 oz) consistently performed better for yield and crop value than the smaller whole seed or the cut seed.

Future Research

- We are going to continue work in 2018, looking at comparing seed grown to be whole seed (two sources) against a conventional PEI cut seed source. 4 reps/treatment.

- 2017 field scale trial did not show conclusive results, but water stress was issue. Plan to replicate in 2018 at two locations, comparing MB whole seed against PEI cut seed, both of high quality.

- Economic Analysis of Whole Seed System/Hybrid System for PEI

Questions?

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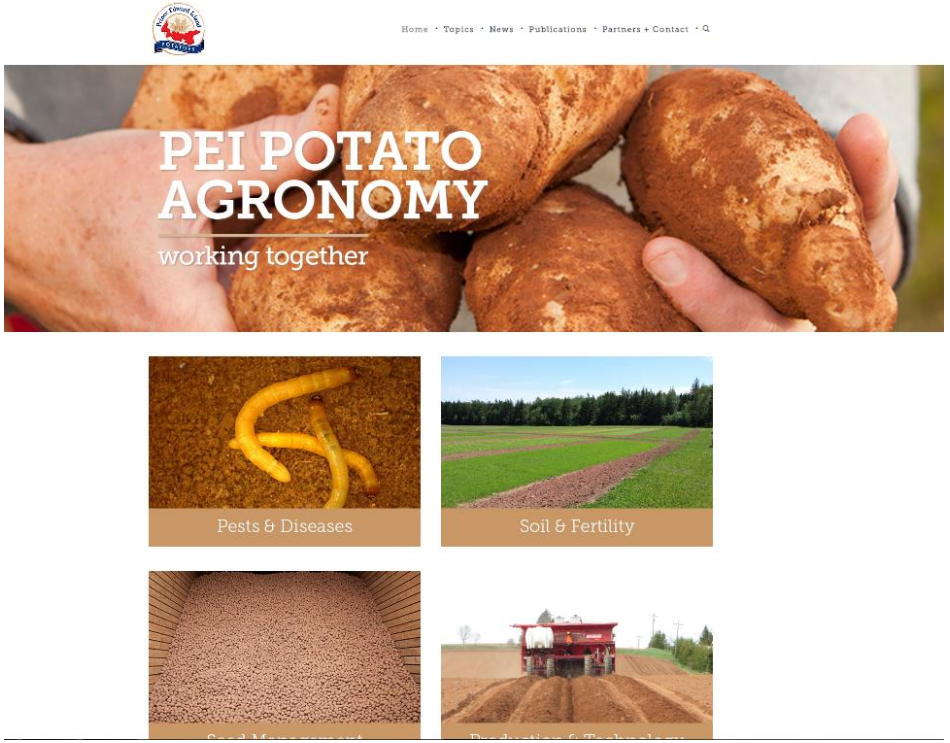

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