Seeding Rates for Precision Seeded Canola

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Sources of Yield Increments

• Since the 1950’s yield increment has been improved
  • improved cultivars (50 %)
  • Improved fertility, pest management (50 %)
• Breeding continues to advance yield potential
• How much more progress can we see with fertility and management?
• Is there potential for precision seeding?
  • Even crop emergence across field
  • Reduced seed cost
  • Higher yield (Economic benefit)
Precision Seeded Corn

• Began with introduction of high yielding hybrids
  • Seed costs were high
  • Crop was very responsive to management

• Plant density
• Row spacing
• Early vs late emerging plants
• Overall precision seeded corn increased yield by 15-20 %

• But corn isn’t canola
  • Seed size (Difficult to “singulate” seed)
  • Emergence % is variable
  • Self-thinning
  • Capacity to compensate for lower populations
Relationship between Plant Density & Yield

• Yields are generally maximized at plant populations above 50 plants m$^{-2}$

• Canola can compensate at low plant populations by increasing branching to maintain yield over a range of plant densities

• Plants uniformity is vital when plant density decreased
Figure 1. Uniform stands yield more, especially at lower plant densities.

Seed Metering Systems for Air-Carts

UltraPro Roller

Valmar Roller
Study Objectives

• Assess seedling uniformity of the UltraPro Roller compared to a traditional Valmar Roller

• Determine if differences in uniformity affect minimum plant population required to reach maximum yield potential of canola
Scott, SK
(Dark Brown Soil Zone)

Melfort, SK
(Black Soil Zone)

Indian Head, SK
(Black Soil Zone)

Redvers, SK
(Black Soil Zone)

http://commons.wikimedia.org/wiki/File:Palliser%27s_Triangle_map.png#mediaviewer/File:Palliser%27s_Triangle_map.png
% Emergence

% Emergence by Seeding Rate and Roller Type

Seeding Rate (seeds/m²)

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<thead>
<tr>
<th>Seeding Rate</th>
<th>Ultra</th>
<th>Valmar</th>
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10% improved emergence with Valmar likely due to UltraPro metering seed more accurately – releasing fewer seeds.
Uniformity

Broken-Line Regression:
Standard Error of Distance Between Plants vs. Plant Density

- High Yielding Sites
- Low Yielding Sites
Yield vs. Plant density

Broken-Line Regression:
Seed Yield vs. Plant Density by Roller Type

High Yielding Sites
Low Yielding Sites

Valmar
UltraPro
Preliminary Conclusions

• Lowest seeding rate was likely not metered out accurately
  • It appears the UltraPro accurately metered out seed than the Valmar

• Increasing plant population rapidly decreased variability in distance between seedlings
  • Plant uniformity was affected by plant density, not roller type

• Plant uniformity does not appear to be as important as plant density/other factors in determining canola yield potential
  • High yielding sites – needed 38 plants m\(^{-2}\) to reach maximum yield, but uniformity was maximized at 27 plants m\(^{-2}\)
  • Low-yielding sites – needed only 17 plants m\(^{-2}\) to reach maximum yield, but uniformity was maximized at 38 plants m\(^{-2}\)
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For more information visit: www.westernappliedresearch.com