Eastern Broccoli Project Update: Phase III Small-Plot Variety Evaluation, 2015

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Dan Henry, W.D. Henry & Sons, Eden, NY

Objective

To trial the most promising varieties identified through Phase III on-farm variety trials 2013-2014 during the shoulder of the main season (in New York: to harvest in mid-August) when heat stress is of greatest concern.

Ultimately, when broccoli varieties can be grown during the most heat-stressful part of the season, then broccoli will be available year-round in Eastern U.S.

Varieties

To ensure unbiased rating results, all entries in Phase III on-farm trials were coded:

- RJ: Green Magic – Industry Standard (Sakata)
- PR: Burney – Bejo
- WQ: Dura Pak 19 - Syngenta
- GY (Experimental) – undisclosed
- Grower Standard – Emerald Crown (1 rep only)

Site Information

Dan Henry
W.D. Henry & Sons
7189 Gowanda State Rd
Eden, NY 14057

Wholesale ~120 acres of broccoli

Heat Stress

- yellow beading
- inner leaves
- Rot & yellow beading
- Uneven beading

Site Information

- Transplanted - plugs
- **Planting date: June 25, 2015**
- Raised beds:
  - Bed spacing: 10 inch
  - Rows per bed: 2
  - Bed width: 20 inch
  - Bed height: 4 inch
- **Plant spacing:*
  - In-row: 9.5 inches
  - Between rows: 10 inches (on bed) & 30 (between beds)
- **Plant population: ~33,000 plants per acre**
- *to target mid-August harvest; shoulder of main season
Trial Design

- Four replicates per variety
- 2 beds x ~200 plants = 250-350 plants per rep
- Only one rep of grower standard, Emerald Crown
- Harvest all heads 5-7 inches in diameter (including unmarketable) every 3-4 days
- 6 harvests per variety Aug-18 to Sep-12
- Yield calculations were based on number of plants accounted for (total harvested + total left in field), each plant = 1 ft² area
- Reps 1 & 3 had club root and were dropped from this analysis

Summary of 6 Harvests (Healthy Reps)
(Aug 18 to Sept 12)

<table>
<thead>
<tr>
<th>Grower Standard</th>
<th>Emerald Crown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Marketable 5.5 – 7” (box/A)</td>
<td>820</td>
</tr>
<tr>
<td>Unmarketable (box/A)</td>
<td>367</td>
</tr>
<tr>
<td>% Marketable (by head ct)</td>
<td>63.7%</td>
</tr>
<tr>
<td>% Heads left in field* - Healthy undersized</td>
<td>na</td>
</tr>
<tr>
<td>% Heads left in field* - Heat stressed (undersized)</td>
<td>na</td>
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<tr>
<td>Average Head Size (lb)</td>
<td>0.75 lb</td>
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*after the 6th harvest

Summary of 6 Harvests (1 Healthy Rep)
(Aug 18 to Sept 12)

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Emerald Crown (Grower Standard)

Grower Standard (Emerald Crown)
Harvest (Healthy Rep 1)

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<th>Grower Standard (Emerald Crown): Healthy Rep 1</th>
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<td>Total Marketable: 820 box/acre = 69.1%</td>
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<td>Total Unmarketable: 367 box/acre = 30.9%</td>
</tr>
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<td>Average Head Size: 0.75 lb</td>
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*after the 6th harvest
RJ (Green Magic): Industry Standard

Aug 25

RJ (Green Magic) Harvest (Healthy Reps 2 & 4)

GY (Experimental):

Aug 25

GY (Experimental) Harvest (Healthy Reps 2 & 4)

PR (Burney):

Aug 25

PR (Burney) Harvest (Healthy Reps 2 & 4)
Unlike other varieties, WQ endured extra stress due to lack of irrigation.

Note: Grower turned off irrigation and because this variety was later maturing, it did not reach its full yield potential.

Summary:

- This was a very tough harvest window. All varieties had high levels of heat stress.
- Burney, GY Experimental and Emerald Crown all performed better than Green Magic (426 box/A; 40% marketable), and had greater yields than Green Magic and greater than 50% marketable.
- Dura Pak 19 was not fairly judged in this trial. The grower turned the irrigation off, and because this was a later maturing variety, it never had the opportunity to reach its full yield potential.

Contact Information

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