2006 Potato Variety Report: Introduction

Chad M. Hutchinson & Doug Gergela

General Potato Production Information

Potato clones were obtained from university, government, and industry breeding programs. Clones progress through the evaluation program following the track described in the Potato Variety Evaluation Flowchart (Figure 1, page 7).

Potatoes (Solanum tuberosum L.) in the Tri-County Agricultural Area (TCAA) around Hastings, Florida are grown in 60-foot-wide beds consisting of sixteen rows. Rows are raised with a between-row spacing of 40 inches (center to center). The research plots were irrigated with seepage irrigation. A clay layer underlies the topsoil at a depth of three to five feet in the TCAA. In this system, the perched water table depth is managed by water flow into irrigation canals spaced between beds. Potato beds were irrigated continuously over the season except after a rain event.

Variety trials, unless noted, were conducted at the Plant Science Research and Education Units Hastings Farm in Hastings, FL. The PSREU is part of the University of Florida/IFAS network of research farms located around the state to conduct research on important horticultural crops. The soil at the field site is classified as Ellzey fine sand (sandy, siliceous, hyperthermic Arenic Ochraqualf; sand 90-95%, < 2.5% clay, < 5% silt).

Potatoes were planted following a sorghum/sudan grass summer cover crop (Sorghum bicolor (L.) Moench x S. arundinaceum (Desv.) Stapf var. SX17, Dekalb). Cover crop was incorporated into the potato beds in September, 2005. Potato beds were fumigated with 1,3-dichloropropene (Telone II, 6 gal/A) in mid-December 2005. Potato seed pieces were dusted with fungicide (Maxim MZ) prior to planting. Quadris (8 oz/A) was applied in furrow at planting. Aldicarb (Temik, 20 lb/A) was also applied in furrow at planting. Metribuzin (Sencor DF, 16 oz/A) and Metolachlor (Dual II Magnum, 1 pt/A) were broadcast at hilling. Fungicides and insecticides were applied on a schedule based on IPM practices. Fresh market variety plots were vine-killed by chemical desiccation with diquat (Reglone 1 pt/A, 2 applications).

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Fertilizer (100-43-86 granular) was incorporated into the beds prior to planting. Two split side-dress fertilizer applications (65-0-56, granular) were made in all trials during the season. Side-dress application dates, depending on the planting date of the respective trial, were March 8, 16, and 27, 2006.

Potato seed pieces were hand cut (approx. 2.5 oz) and hand planted on an 8-inch within-row spacing unless otherwise noted. Plant growth characteristics were rated during the season following the descriptions listed in Table 1 (page 8). Plant type was rated at full flower approximately 60 days after planting. No growth enhancers or chemicals to enhance skin color were used in any trial unless otherwise noted.

Plots were harvested with a single-row, commercial potato harvester. Potatoes were graded using commercial grading equipment. Culls were removed and remaining potatoes were separated into six size classes and weighed. Specific gravity was measured on a random 20-tuber sample from each plot using the weight-in-air/weight-in-water method. A random sample was rated for external appearance characteristics. External tuber quality characteristics were rated following the descriptions in Table 2 (page 9). A second 20-tuber sample was collected and each tuber cut into fourths and rated for hollow heart (HH), brown rot (BR), corky ringspot (CRS), internal heat necrosis (IHN), and brown center (BC). BC was rated as light, moderate, or heavy if the cut pieces displayed the respective defects.

Sub-samples of potatoes from the USPB/SFA and Chipping trial were shipped to Utz Quality Foods. Chips were prepared and rated following the procedures outlined in the Snack Food Association Chipping Potato Handbook (1995). Chip Agtron scores are presented in their respective chapters. An Agtron value of 45 is usually the standard for acceptable potato chip color. Agtron values less than 45 are considered unacceptable. A sub-sample of potatoes was also chipped by Wise Foods. Visual rating scores are not presented due to space limitations.

\textit{Seasonal Weather and Growing Conditions}

Weather conditions were unseasonably dry during the 2006 potato season (Appendix 1; Tables 34 and 35). January and February saw mostly normal rainfall. March, April and May were noticeably drier than normal in the TCAA. Early June was also dry, allowing later harvest of tubers. Only four mornings had temperature readings at or below freezing. Seepage irrigation ran almost constantly from mid-late February until two weeks prior to harvest. Overall, yields and quality at the research farm were about average.

\textit{Production}

There were no production technique changes for 2006.

\textit{Acknowledgements}

Many talented and dedicated people assisted in these experiments. Invaluable technical support was provided by Doug Gergela and Pam Solano. The variety evaluation team is indebted to Dr. Christine Worthington, Dr. Fernando Munoz, Scott Taylor, Bart Herrington, Larry Miller, Billy Wingate, Hugh Burnham, Dan Huff and Zhiwei “Allen” Chen for their hard work. Without the commitment and effort from these individuals, the variety evaluation program would not be possible.

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FIGURE 1. POTATO VARIETY PROGRAM EVALUATION FLOWCHART.
Table 1. Plant Growth Characteristics

<table>
<thead>
<tr>
<th>Rating</th>
<th>Early Vigor (plant height)</th>
<th>Vine Type</th>
<th>Vine Maturity at Harvest/Vine Kill</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>no emergence</td>
<td>decumbent – poor</td>
<td>dead</td>
</tr>
<tr>
<td>2</td>
<td>leaves in rosette</td>
<td>decumbent – fair</td>
<td>+</td>
</tr>
<tr>
<td>3</td>
<td>plants &lt; 2 in</td>
<td>decumbent – good</td>
<td>yellow and dying</td>
</tr>
<tr>
<td>4</td>
<td>plants 2 to 4 in</td>
<td>spreading – poor</td>
<td>+</td>
</tr>
<tr>
<td>5</td>
<td>plants 4 to 6 in</td>
<td>spreading – fair</td>
<td>moderately senesced</td>
</tr>
<tr>
<td>6</td>
<td>plants 6 to 8 in</td>
<td>spreading – good</td>
<td>+</td>
</tr>
<tr>
<td>7</td>
<td>plants 8 to 10 in</td>
<td>upright – poor</td>
<td>starting to senesce</td>
</tr>
<tr>
<td>8</td>
<td>plants 10 to 12 in</td>
<td>upright – fair</td>
<td>+</td>
</tr>
<tr>
<td>9</td>
<td>plants &gt; 12 in</td>
<td>upright – good</td>
<td>green and vigorous</td>
</tr>
</tbody>
</table>

Adapted from Sisson and Porter, 2002.
Table 2. Internal and External Potato Tuber Characteristics

<table>
<thead>
<tr>
<th>Rating</th>
<th>Internal Flesh Color</th>
<th>Skin Color</th>
<th>Skin Texture</th>
<th>Tuber Shape</th>
<th>Eye Depth</th>
<th>Overall Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>White</td>
<td>Purple</td>
<td>Partial Russet</td>
<td>Round</td>
<td>Very Deep</td>
<td>Very Poor</td>
</tr>
<tr>
<td>2</td>
<td>Cream</td>
<td>Red</td>
<td>Heavy</td>
<td>Russet</td>
<td>Mostly Round</td>
<td>+ + +</td>
</tr>
<tr>
<td>3</td>
<td>Light Yellow</td>
<td>Pink</td>
<td>Mod. Russet</td>
<td>Round to Oblong</td>
<td>Deep</td>
<td>Poor</td>
</tr>
<tr>
<td>4</td>
<td>Medium Yellow</td>
<td>Dark Brown</td>
<td>Light Russet</td>
<td>Mostly Oblong</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>5</td>
<td>Dark Yellow</td>
<td>Brown</td>
<td>Netted</td>
<td>Oblong</td>
<td>Intermediate</td>
<td>Fair</td>
</tr>
<tr>
<td>6</td>
<td>Pink</td>
<td>Tan</td>
<td>Slightly Netted</td>
<td>Oblong to Long</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>7</td>
<td>Red</td>
<td>Buff</td>
<td>Mod. Smooth</td>
<td>Mostly Long</td>
<td>Shallow</td>
<td>Good</td>
</tr>
<tr>
<td>8</td>
<td>Blue</td>
<td>White</td>
<td>Smooth</td>
<td>Long</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>9</td>
<td>Purple</td>
<td>Cream</td>
<td>Very Smooth</td>
<td>Cylindrical</td>
<td>Very Shallow</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Adapted from Sisson and Porter, 2002.