‘HARLEY BLACKWELL’ A NEW CHIP STOCK POTATO VARIETY FOR FLORIDA

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Abstract. ‘Harley Blackwell’ is an internal heat necrosis (IHN) resistant chip stock potato (Solanum tuberosum L.) variety recently released by the USDA. It was tested at the University of Florida’s Plant Science Research and Education Unit during eight seasons from 1999 to 2005 originally under the selection number B0564-8. Production practices followed standard IFAS BMP recommendations. ‘Harley Blackwell’ tubers are consistently described as having a tan to buff skin color with a netted texture. Tuber flesh color is white to cream. Tuber shape is rated as ‘mostly round’ to ‘round to oblong’ with an eye depth of intermediate to shallow. External tuber appearance is noted as fair to good. ‘Harley Blackwell’ plant architecture is ‘spreading upright’ with a good canopy. Early plant vigor (size) is similar to ‘Atlantic’, as well as, early plant maturity rating. Total and marketable yields of ‘Harley Blackwell’ averaged approximately 10% less than ‘Atlantic’ over all seasons evaluated. In addition, specific gravity averaged approximately 0.005 lower than that of ‘Atlantic’ although still at an acceptable level for Florida chip potatoes. ‘Harley Blackwell’ tubers exhibited on average that of ‘Atlantic’ although still at an acceptable level for Florida production at the university of Florida potato research farm.

Materials and Methods

Trials were conducted at the Plant Science Research and Education Unit-Hastings Farm in Hastings, Fla. The soil at the field site is classified as Elleyz fine sand (sandy, siliceous, hyperthermic Arenic Ochraqualf; sand 90-95%, <2.5% clay, <5% silt).

Potatoes in the Tri-County Agricultural Area around Hastings, Florida are grown in 16-row, 60 ft wide beds. Rows are raised with a 40 inch between-row spacing (center to center). A clay layer is present 3 to 4.5 ft below the top of the row. Plots were irrigated with seepage irrigation. Perched water table depth is managed at 19 to 25 inches below the top of the row.

Potatoes were planted following a sorghum/sudan grass summer cover crop (Sorghum bicolor (L.) Moench × S. arundinacaeum (Desv.) Stapf var. SX17, Dekalb). Cover crop was incorporated into the potato beds in Sept. prior to the potato season.

Potato seed (var. ‘Harley Blackwell’) was obtained from the USDA potato breeding program in Beltsville, Md. or the Maine Farmers Exchange (MFX, Presque Isle, Maine). ‘Harley Blackwell’ was classified before release as B0564-8. Seed tubers were produced on the USDA potato research farm in Presque Isle, ME the season before planting in Florida or on contract growers’ farms in Maine. Potato seed tubers were hand cut (approx. 2.5 oz) and hand planted on 8-inch in-row spacing. Dates of planting for the six years reported were 11 Feb. 1999; 15-16 Feb. 2000; 28 Jan. 2002; 27 Jan. 2003; 27 Jan. 2004, and 25 Jan. 2005. No ‘Harley Blackwell’ was planted at the research farm in 2001. Potato plots were replicated four times in each year as part of either the round white-fresh market trial or the chip trial at the research site. Means of the four replicates are presented in Tables 1 and 2.

Potato seed pieces were dusted with fluidoxinil and mancozeb (Maxim MZ) prior to planting. Aldicarb (Temik 15G, 20 lb product/A) and azoxyostrobins (Quadris, 5.0 oz product/A; in years 2002, 2003, 2004, and 2005) were applied in-furrow at planting following label requirements. A combination of metolachlor (Dual Magnum, 1.0 pint product/A) and/or metribuzin (Sencor DF, 1.0 lb product/A) was broadcast at hilling for weed control following extension and label recommendations for a sandy soil. Fungicides were applied on a schedule during the season based on extension recommendations (Hutchinson et al., 2005).

Prior to planting, 715 lb of 14-6-12 (N-P-K) was incorporated in the row. When plants were six to ten inches tall, another 715 lb of 14-0-12 (N-P-K) was applied to row shoulders. In 2003 and 2004, an extra 30 lb N/A was applied at side dress because of heavy rainfall between planting and side dress applications.

Potatoes in plots were harvested with a single-row commercial potato harvester and graded on 1 Jun. 1999; 1 Jun. 2000; 9 May 2002; 11 May 2003; 10 May 2004; and 10 May 2005. Culls were removed and remaining potatoes were separated into either five or six size classes: Class (wt) / (total yield (wt) – culls (wt)) depending on the year and weighed (C = 0.5 to 1.5, B = 1.5 to 1/7, A = 1.7 to 8/2, A5 = 2.5 to 3.25, A3 = 3.25 to 4, A4 ≥ 4 inches). Culled tubers were sunburned, rotten, growth cracked, and/or misshaped.

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Specific gravity was measured on a random tuber sample from each plot using the weight-in-air/weight-in-water method. Specific gravity samples were combined for each replication and tubers were rated for external tuber characteristics by one to three raters depending on the year. Rating scores were averaged over the number of raters following the guidelines in Table 3. Internal tuber characteristics were rated on a 20-tuber sample from each of four plots. Tubers were cut into quarters and rated on the incidence of the disorder.

In 2002, 2003, and 2005, a 20 lb sample of potatoes was shipped on potato trucks in the area to either Wise Foods, Inc. (Kennesaw, Ga.) or Utz Quality Foods, Inc. (Hanover, Pa.). Potatoes were chipped, fried, and rated for internal appearance (Table 2). Over all years tested, the percent culls for 'Harley Blackwell' were in an acceptable range. By approximately 100 d after planting, plant maturity at harvest was rated generally as “yellow and dying” on the plant maturity scale (Table 2). Plant maturity or season length is similar to ‘Atlantic’. ‘Harley Blackwell’ potatoes averaged a 2.3 chip rating over the six production seasons. In the same trials, ‘Atlantic’ averaged a 3.7 chip color rating (data not shown).

Although total tuber yield and specific gravity of ‘Harley Blackwell’ are slightly lower than ‘Atlantic’, ‘Harley Blackwell’ is an internal heat necrosis resistant variety. In the six trials in this study, ‘Harley Blackwell’ tubers did not express internal heat necrosis. However, the percent of ‘Atlantic’ tubers with IHN was 0.7% (Table 2). From 1999 to 2005, ‘Harley Blackwell’ and ‘Atlantic’ were grown in 23 and 70 research and grower variety trials, respectively. On average, the percent of ‘Atlantic’ tubers exhibiting internal heat necrosis was 0 and 3% (data not shown). Although this

Table 2. Percent total culls, vine maturity at harvest, tuber external characteristics, and internal defects of ‘Harley Blackwell’, a chipping potato variety.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total culls (%)</th>
<th>Vine maturity</th>
<th>Tuber external characteristics</th>
<th>Tuber internal defects (%)</th>
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<tr>
<td></td>
<td></td>
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<td>IFC SC ST TS ED APP HH BR CRS IHN</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>5</td>
<td>—</td>
<td>8.0 5.0 2.0 4.0 6.0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>8</td>
<td>—</td>
<td>6.3 4.7 2.3 6.3 5.7 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>2</td>
<td>1.5</td>
<td>6.5 5.8 2.0 6.5 7.0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>2</td>
<td>3.3</td>
<td>6.3 5.0 2.3 6.3 6.7 8 0 0 0</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>1</td>
<td>3.5</td>
<td>6.7 5.0 2.0 7.3 7.0 0 0 0 0</td>
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</tr>
<tr>
<td>2005</td>
<td>0</td>
<td>6.3</td>
<td>6.3 5.0 2.0 6.5 6.7 0 0 0 0</td>
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</tr>
</tbody>
</table>

*Vine maturity was rated at harvest using the following ratings 1.0 (completely dead), 3.0 (yellow and dying), 5.0 (moderately senesced), 7.0 (starting to senesce), 9.0 (green and vigorous).

*See rating system outlined in Florida Rating Code Table (Table 3).
incidence may seem low, any incidence is bad as it adds to the defect restrictions allowed by processors.

‘Harley Blackwell’ is an acceptable chipping potato for Florida production. ‘Atlantic’ should be planted for early production when contract prices are generally higher and maximal yield is important. ‘Harley Blackwell’ should be planted for late contracts when quality can become an issue with ‘Atlantic’.

Literature Cited


