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2006 POTATO VARIETY EVALUATIONS

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INTRODUCTION

Each year we conduct a series of variety trials to assess advanced potato selections from the Michigan State University and other potato breeding programs at the Montcalm Research Farm. The evaluation also includes disease evaluation in the scab nursery and foliar and tuber late blight evaluation at the Muck Soils Research Farm. The objectives of the evaluations are to identify superior varieties for fresh market or for processing and to develop recommendations for the growing of those varieties. The varieties were compared in groups according to the tuber type and skin color and to the advancement in selection. Each season, total and marketable yields, specific gravity, tuber appearance, incidence of external and internal defects, chip color (from field, 45°F and 50°F storage), as well as susceptibilities to late blight (foliar and tuber), common scab, and blackspot bruising are determined.

PROCEDURE

Ten field experiments were conducted at the Montcalm Research Farm in Entrican, MI. They were planted as randomized complete block designs with two to four replications. The plots were 23 feet long and spacing between plants was 12 inches. Inter-row spacing was 34 inches. Supplemental irrigation was applied as needed. The field experiments were conducted on new potato ground that was in corn the previous year.

The round white tuber types were divided into chip-processors and tablestock and were harvested at two dates (Date-of-Harvest trial: Early and Late). The other field experiments were the North Central White, Russet, Red, Adaptation (tablestock and chip-processors), and Preliminary (tablestock and chip-processors) and Transgenic trials. In each of these trials, the yield was graded into four size classes, incidence of external and internal defects in > 3.25 in. diameter or 10 oz. potatoes were recorded, and samples for specific gravity, chipping, disease tests, bruising, and cooking tests were taken. Chip quality was assessed on 25-tuber samples, taking two slices from each tuber. Chips were fried at 365°F. The color was measured visually with the SFA 1-5 color chart. Tuber samples were also stored at 45°F and 50°F for chip-processing out of storage in January

and March. Advanced selections are also placed in the Commercial Demonstration Storage for monthly sampling. The scab nursery at the MSU Soils Farm and the late blight trial at the Muck Soils Research Farm are used for scab and foliar late blight assessment of lines in the agronomic trials.

RESULTS

A. Date of Harvest Trial Varieties:

Chip-processors and Tablestock (Tables 1 and 2)

There were 24 entries that were compared at two harvest dates. Atlantic, Snowden, Pike and four Frito-Lay clones were used as checks. The two new Frito-Lay clones evaluated this year were FL2048 and FL2053. The plot yields were below average in the early harvest (94 days), and specific gravity values were more typical to an average year. Most lines increased at least 100 cwt/a in yield for the second harvest date (152 days). The results are summarized in **Tables 1 and 2**. Hollow heart and vascular discoloration were the most prevalent internal defects this year, and above average internal brown spots in the late harvest material. *Note that last year we changed the format of all variety trial tables so that the internal defects are presented as percentages rather than as a count.* Atlantic and FL1879 showed the highest incidence of hollow heart between the two harvest dates. In the early harvest trial, the best yielding chipping lines were FL1879, FL2053, MSJ036-A, and MSJ147-1. MSM171-A is a round-white tablestock line with scab resistance, strong foliar late resistance, and an early maturity. The highest yielder for the late harvest was MSJ036-A, followed by FL1879, Beacon Chipper and MSJ461-1. MSJ036-A has high yield potential and shows scab resistance and chip-processing potential. Beacon Chipper also has high yield potential, reduced scab susceptibility and chip-processing potential. MSJ147-1 is showing promise as a chipper out of colder and long term storage. MSJ461-1 is a promising chip-processing line with strong foliar resistance to late blight that also has tablestock quality. MSL211-3 is a bright skinned round white with both late blight and scab resistance. MSN105-1 is a round-white tablestock with good scab resistance and moderate late blight resistance. In addition, MSJ036-A, MSJ316-A, MSH228-6, MSK061-4, MSM171-A, MSN105-1, MSL007-B, MSK409-1 and FL1922 offer scab resistance.

The out-of-the-field chip scores for 2006 were darker than we have seen in past years. The chips were consistently darker for all trials from the Montcalm Research Farm, including control reference varieties. In general, chip scores seemed to be 0.5 to 1.0 degrees darker, using the Snack Food Association 1-5 rating system (i.e. chip scores for Atlantic, Snowden, Pike, and FL1879).

Variety Characteristics

Beacon Chipper – an unknown eastern chip processing line thought to be from USDA-Beltsville. It has high yield potential and scab tolerance along with excellent chip-processing quality. Beacon Chipper was named and released in 2005.

MSE221-1 – an MSU tablestock selection. A 'Superior-type' potato that has moderate scab resistance and a higher yield potential than the variety Superior. The tuber type is also more attractive than Superior.

MSH228-6 – a chip-processing line with moderate scab resistance. It has a good type and has performed well in on-farm trials.

MSJ036-A – an MSU chip-processing selection with high yield potential. It also has a high specific gravity and scab resistance. The tuber type of MSJ036-A is round and attractive.

MSJ126-9Y – an earlier season chip-processing line with excellent chip quality and long-term storage potential. This line also has moderate scab resistance and an attractive type.

MSJ147-1 – a full season storage chipper that also has some early sizing. It has excellent chip-processing quality and a large percentage of A-size tubers. It has performed well in on-farm trials and has demonstrated an excellent long-term storage chipping profile.

MSJ316-A – an MSU chip-processing selection. Has high yield potential and scab resistance and bright skin appearance. Currently in on-farm trials.

MSJ461-1 – an MSU chip-processing selection with strong foliar resistance to late blight and maturity similar to Snowden. It has excellent chip-processing quality, smooth round shape and above average yield, but an intermediate specific gravity in most years. The chips show few defects. It has good tablestock quality too.

MSK061-4 – an attractive round-white chip-processing line with good scab resistance. This line produces clean chips with good specific gravity and average yield, with low blackspot bruising.

MSK409-1 – a round-white chip-processing line with good scab resistance. This earlier maturing line has average yield and slightly lower specific gravity.

MSL007-B – an MSU chip-processing selection with strong scab resistance, uniform round type, and a unique netted skin. This newer line produces excellent chips with a good specific gravity and average yield.

MSL211-3 – an attractive round-white tablestock line with strong foliar late blight resistance, moderate scab resistance, and an early maturity.

MSM171-A – a round-white tablestock line in excellent scab resistance and strong foliar late blight resistance. This line also has an early maturity with an attractive set of tubers.

Note: In December 2004 and 2005, MPIC sponsored a booth at the Great Lakes Expo to market Liberator, Michigan Purple and Jacqueline to the farm market/roadside stand market segment. This grass roots effort may be the method to have these potatoes reach the consumers. The description of these varieties are below. The booth was not at the Great Lakes Expo in 2006 due to a scheduling conflict.

MICHIGAN PURPLE - a tablestock selection with an attractive purple skin. This selection has high yield potential and the tubers have a low incidence of internal defects. The vine maturity is mid-season to mid-early. Do not let the tubers oversize. A thin skin makes this variety a challenge market on a large scale without making adjustments in harvest, washing and grading process. We regard this as a variety that can compete in the red market. It has great potential in the roadside stand and farm markets.

JACQUELINE LEE – an MSU oval/oblong tablestock selection with a high tuber set. The tubers have the bright skinned, smooth and attractive appearance that is typical of many European cultivars. The tubers have very low incidence of internal defects and good baking quality. It is our best tasting potato! The strength of this selection is also its strong foliar resistance to the US8 genotype of late blight. Vine maturity is similar to Snowden. There is interest in California to market this variety. It has great potential in the roadside stand and farm markets.

B. North Central Regional Trial Entries (Tables 3, 4, 5)

The North Central Trial is conducted in a wide range of environments (11 regional locations) to provide adaptability data for the release of new varieties from North Dakota, Minnesota, Wisconsin, Michigan and Canada. Eighteen breeding lines and 6 varieties were tested in Michigan. The clones were incorporated in the Round White (7 entries), Russet (7 entries), or Red-Skinned (4 entries) trials according to market class, and the results are presented in **Tables 3, 4, and 5**. These lines are all designated with the superscript$^{\mathbf{NCR}}$ in the tables. The MSU lines MSJ461-1, MSI005-20Y and MSA8254-2BRUS were the Michigan representatives included in the North Central Trial. MSJ461-1 has a uniformly nice type with strong foliar late blight resistance. MSI005-20Y is a yellow-fleshed line with high yield potential and an attractive round appearance. The russet line MSA8254-2BRUS has good agronomic characteristics including high yield potential and strong scab resistance. The most promising Wisconsin selections were W2324-1 (the highest yielder in the Round White Trial) and W2133-1.

C. Round White Trial (Table 3)

The 23 lines in the Round White Trial consisted mainly of the round-white chip-processing entries from the North Central Regional Trial, as well as other breeding lines from New York, Wisconsin, and Colorado. The top yielding lines were W2324-1,