

AN EVALUATION OF POTATO QUALITY DURING STORAGE

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Introduction

Tuber stem-end fry color and specific gravity are important quality criteria for frozen french fries. Processors require a light, uniform fry color. Processors also have requirements for specific gravity. Low tuber specific gravity results in poor processing quality. Potatoes are stored by processors from harvest to harvest, so tuber quality loss during storage can be a problem.

Two experimental varieties from the Oregon Variety Development Program, AO82611-7 and COO83008-1, have shown superior agronomic characteristics in statewide trials and are being considered for release for processing in the near future. The quality of these new varieties after storage is not well known. This trial compared Russet Burbank, Shepody, Frontier Russet, Ranger Russet, AO82611-7 and COO83008-1 for changes in tuber stem-end fry color and specific gravity during storage following production under furrow irrigation.

Procedures

The six potato varieties were grown with furrow irrigation and fertilized at four rates (0, 84, 144, and 204 lb N/ac) during the 1995 season. Potatoes were harvested on September 26. Tuber stem-end fry color and specific gravity were determined for a 20 tuber sample from every variety, N rate and replicate on November 10, 1995. An additional 70 lb of tubers from each variety from each N rate treatment were placed in a controlled atmosphere storage at 45 °F and 90 percent relative humidity. The remaining tubers were transported to a commercial potato storage in Ontario, Oregon, and treated with sprout inhibitor (Sproutnip 7A at 1 lb ai/600 cwt of tubers) on December 20, 1995. These potatoes were returned to the Malheur Experiment Station storage on December 22. Four 20-tuber samples of each variety were used to determine stem-end fry color and specific gravity. Each 20 tuber sample for each variety consisted of five tubers from each N rate treatment. Tuber stem-end fry color and specific gravity were evaluated January 5, February 6, and March 12, 1996. Tuber stem-end fry color was determined one half inch from the tuber stem end on fried slices using a Photovolt Reflectance Meter Model 577 (Photovolt Co., Indianapolis, IN) and methodology as described by Shock et al., 1994. Tuber specific gravity calculations were based on tuber weight in air and in water.

Results and Discussion

The experimental cultivar COO83008-1 had the lightest frying tubers on November 10, 1996 (Table 1, Figure 1). The experimental cultivars AO82611-7 and COO83008-1 had significantly lighter stem-end fry colors than the commercial cultivars on all subsequent evaluation dates. Ranger Russet had the highest specific gravity on November 10, 1995 and on March 12, 1996 (Table 1, Figure 2). AO82611-7 and COO83008-1 had among the next highest specific gravities on November 10, 1996. COO83008-1 and Frontier Russet had among the next highest specific gravity on March 12, 1996.

Conclusions

The superior tuber stem-end fry color and high specific gravity of the experimental varieties AO82611-7 and COO 83008-1, relative to the commercial varieties, were maintained during the 4 month storage.

Literature cited

Shock, C. C., T. D. Stieber, J. C. Zalewski, E. P. Eldredge, and M. D. Lewis. 1994. Potato tuber stem-end fry color determination. *Am Potato J.* 71:77-88.

Table 1. Tuber quality over time for six potato cultivars in controlled atmosphere storage. Malheur Experiment Station, Oregon State University, Ontario, Oregon, 1996.

Variety	Stem-end fry color				Specific gravity			
	November 10, 1995	January 5, 1996	February 6, 1996	March 12, 1996	November 10, 1995	January 5, 1996	February 6, 1996	March 12, 1996
	— % reflectance —							
Russet Burbank	33.2	22.6	21.6	21.9	1.090	1.090	1.090	1.090
Shepody	46.3	28.8	29.9	31.2	1.090	1.090	1.090	1.090
Frontier Russet	33.1	22.5	23.9	26.4	1.090	1.090	1.090	1.090
Ranger Russet	44.9	26.2	24.0	27.5	1.120	1.100	1.100	1.100
AO82611-7	46.1	36.8	37.5	39.0	1.090	1.090	1.080	1.090
COO 83008-1	48.7	33.2	34.9	39.2	1.100	1.090	1.090	1.090
LSD (0.05)	1.5	2.2	2.6	2.4	0.020	0.010	0.010	0.010

Figure 1. Tuber stem-end fry color over time for six potato clones during storage using a Photovolt Reflectance Meter. Malheur Experiment Station, Oregon State University, Ontario, Oregon, 1996.

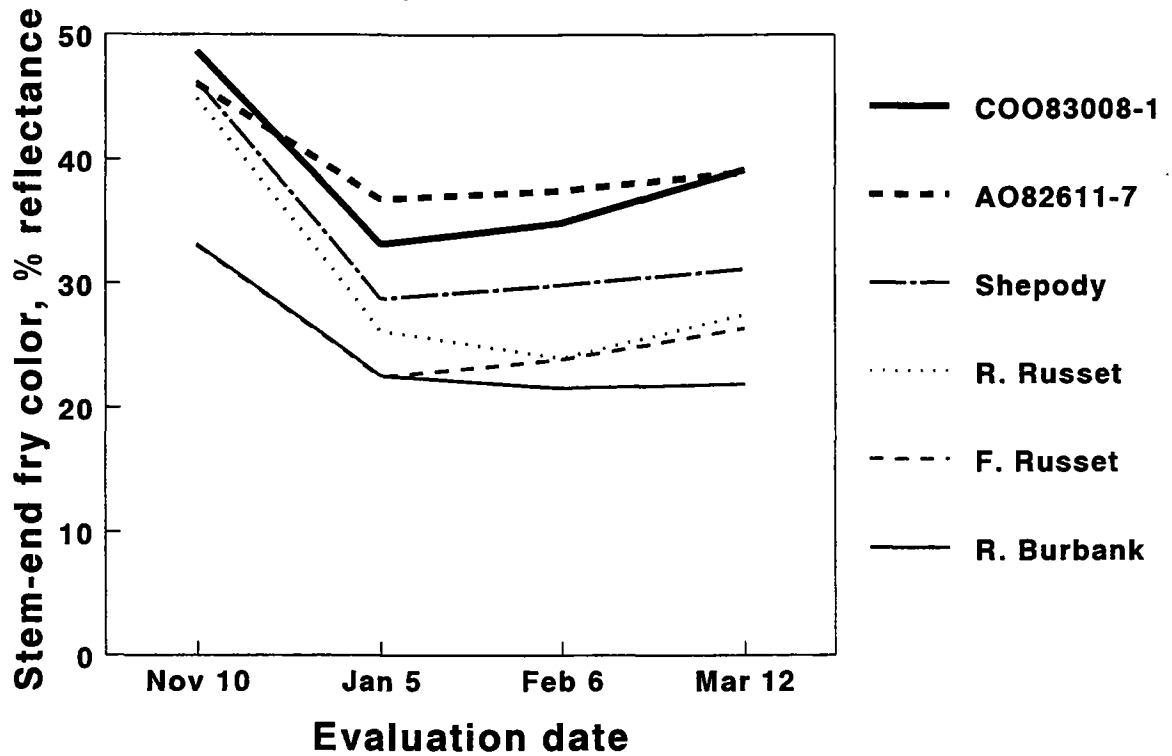


Figure 2. Tuber specific gravity over time for potato varieties in storage. Malheur Experiment Station, Oregon State University, Ontario, Oregon, 1996.

