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TABLE OF CONTENTS

University of Florida Potato Evaluation Program Team	3
University and Industry Cooperators	4
Chapter 1. Introduction.....	5
Figure 1. Potato Variety Program Evaluation Flowchart	7
Table 1. Plant Growth Characteristics	8
Table 2. External and Internal Potato Tuber Characteristics	9
Chapter 2. Early-line Fresh Market Potato Variety Trial	11
Chapter 3. Early-line Chip Potato Variety Trial.....	29
Chapter 4. White-Skinned Fresh Market Potato Variety Trial.....	41
Chapter 5. Red and Purple-Skinned Fresh Market Potato Variety Trial	53
Chapter 6. Russet-Skinned Fresh Market Potato Variety Trial	65
Chapter 7. Chipping Potato Variety Trial.....	71
Chapter 8. Snack Food Association Potato Variety Trial.....	79
Chapter 9. NE-184 Regional Project Potato Variety Trial	85
Chapter 10. Specialty Potato Variety Trial.....	97
Chapter 11. Nitrogen Efficient Potato Variety Trial	103
Chapter 12. Statewide Potato Variety Trial.....	107
Appendix 1. Potato Season Weather Data for Northeast Florida	117
Appendix 2. Potato Selections Evaluated in 2002.....	121

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CHAPTER 1. INTRODUCTION

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 8).

Potatoes (*Solanum tuberosum* L.) in the Tri-County Agricultural Area 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). A clay layer underlies the topsoil at a depth of three to five feet. The research plots were irrigated with seepage irrigation. 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 Hastings Research and Education Center's Yelvington Farm in Hastings, FL. 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 2001. Potato beds were fumigated with 1,3-dichloropropene (Telone II, 6 g/A) in early December 2001. Potatoes seed pieces were dusted with fungicide (Maxim MZ) prior to planting. Aldicarb (Temik, 20 lb/A) was applied at planting. Metribuzin (Sencor, 20 oz/A) was broadcast at hilling. Fungicides were applied on a schedule based on IPM practices. Variety plots were vine killed on May 10, 2002 by cutting and applying paraquat (Boa, 13 oz/A).

Fertilizer (14-2-12 granular) was incorporated into the beds prior to planting and applied in multiple sidedresses following the protocol listed for each trial. Potato seed pieces were hand cut (approx. 2.5 oz) and planted with a carousel planter on a 12-inch within row spacing unless otherwise noted. Plant growth characteristics were rated during the season following the descriptions listed in Table 1 (page 9). Plant type was rated at full flower approximately 65 to 70 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 five 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 and cut into eighths to rate for internal quality. Tuber quality characteristics were rated following the descriptions in Table 2 (page 10).

A sub-sample of potatoes from each plot was shipped to Wise Foods, Inc. and chipped within 48 hr of harvest. Chips were prepared and rated following procedures outlined in the Snack Food Association Chipping Potato Handbook (1995). Chip reference values are as follows: 1 = outstanding, no blemishes or color variations; 2 = very good, minimal blemishes and color variations; 3 = good, acceptable blemishes and color variations; 4 = marginal acceptance, high levels of blemishes and color variation; 5 = not acceptable, high blemish and/or color variation levels.

Seasonal Weather and Growing Conditions

Weather was less than ideal for the 2002 potato season (Appendix 1; Tables 39 and 40). Late January and early February air temperatures were warmer than average. However, by late February and early March, potato plants were covered with soil to protect them from freezing night temperatures. Covering plants caused some mechanical injury because of large plant size. However, the procedure saved some potato fields in Northeast Florida including the research plots at the Hastings REC from unacceptable loss. The potato plants took at least a week to recover and begin growing after removing soil. Some varieties responded better than others after the covering procedure.

The remainder of the potato season was warmer which increased crop water demands. Rainfall was infrequent during the season. The majority of the water used by the crop was provided by seepage irrigation.

Tuber yields were lower on the research farm this season compared to recent years. This was due to covering the plants for freeze protection early in the season and to warm, humid late season temperatures that stressed the plants.

Overall, weather conditions were marginally acceptable (3), fertilization practices were good (4), irrigation practices were good (4), and pest incidence was light (4) for all trials at the Hastings REC. Therefore, overall growing conditions for the trial were good (4) following the Simonne scale (Simonne, 1999; Osborne and Simonne, 2002).

FIGURE 1. POTATO VARIETY PROGRAM EVALUATION FLOWCHART

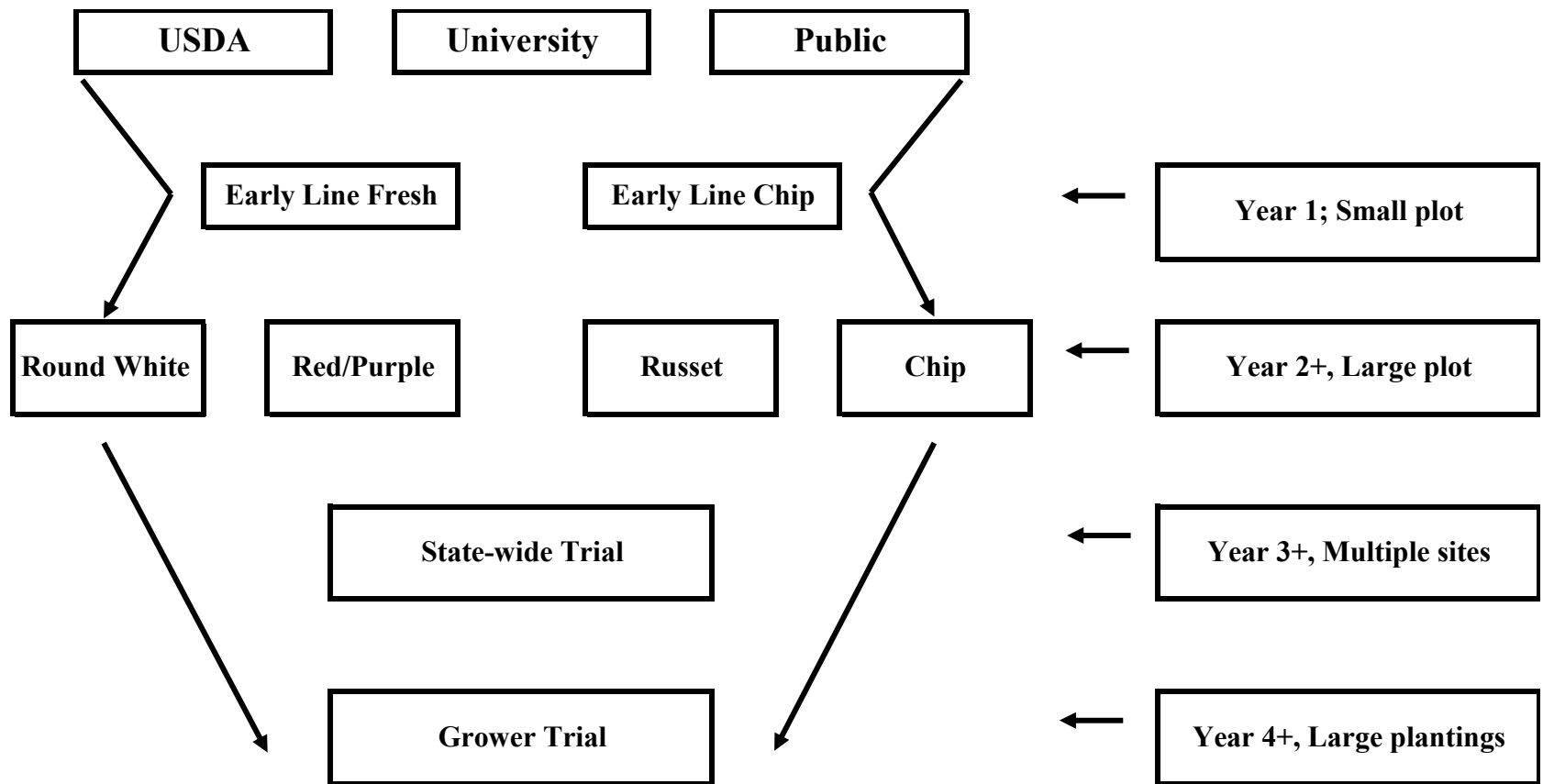


TABLE 1. PLANT GROWTH CHARACTERISTICS

Rating	Early Vigor	Vine Type	Vine Maturity
	(plant height)		at Harvest/Vinekill
1	no emergence	decumbent – poor	dead
2	leaves in rosette	decumbent – fair	+-
3	plants < 2 in	decumbent – good	yellow and dying
4	plants 2 to 4 in	spreading – poor	+-
5	plants 4 to 6 in	spreading – fair	moderately mature
6	plants 6 to 8 in	spreading – good	+-
7	plants 8 to 10 in	upright – poor	starting to mature
8	plants 10 to 12 in	upright – fair	+-
9	plants > 12 in	upright – good	green and vigorous

Adapted from Sisson and Porter, 2002.

TABLE 2. INTERNAL AND EXTERNAL POTATO TUBER CHARACTERISTICS

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

Adapted from Sisson and Porter, 2002.

