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2010 Vegetable Variety Trial Report

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University of Rhode Island 2010 Vegetable Variety Trials

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Description of 2010 Growing Season

The past year was excellent for heat-loving crops. Temperatures were higher than normal for the entire growing season. The average high temperatures were in the 80s for June, July, and August and average lows ranged from 58-62. There were 81 days between May 1 and September 30 with high temperature above 80; 18 of those days had high temperatures above 90. Precipitation was at or below normal for May-September, with a total of 16.7 inches of rain and 26.8 inches of evaporation. However, 19.37 inches of rain in March left the soil profile fully charged, and deep-rooted crops such as our winter squash grew fine without irrigation. Humidity was generally high, with heavy night dews, leading to an abundance of fungal diseases.

Tomatoes

Fresh Market Slicing Tomatoes

In 2010 we evaluated 52 slicing tomato varieties with potential for the direct retail market to determine their suitability for southern New England. Many of the varieties were also evaluated in 2009 when the weather was dramatically different. The trial was planted as three replications, and we collected data on yield as well as disease resistance and overall performance.

Production Methods: The tomato field had been planted to cucumbers and cabbage in 2009. It was cover cropped with rye and hairy vetch over the winter; the cover crop was incorporated the second week of May. Transplants were produced in the URI greenhouses and planted in the field the last week of May. We used a spacing of 5 ft. between rows and 2 ft within the row. Each variety was represented by 15 plants divided into 3 plots except for BHN 961 with 30 plants in 6 plots and Manitoba with 10 plants in 2 plots. North Country Organics Pro-Gro 5-3-4 fertilizer was banded in the row at a rate of 38 lbs nitrogen/acre. A living mulch of turf-type perennial ryegrass and dwarf white clover was seeded between the rows. Drip irrigation supplied water and fish emulsion fertilizer; plants were trellised using a stake-and-weave system on 7 ft rebar stakes. Weeds were controlled by hand pulling within the rows and by mowing the living mulch. The trial was sprayed with *Bacillus thuringiensis kurstaki* at a rate of 1lb per acre on July 15 to control tomato hornworm. Several applications of Deer-Off were made to the edges of the trial to repel voles and woodchucks.

Yield: The trial was harvested thrice-weekly from July 7 until August 28, when disease pressure became so great that there was no marketable fruit. Fruit was harvested when fully ripe; total weight and number of fruit were recorded for each plot. Harvest data are presented in table 1. 'Glacier' was the first variety to ripen, followed by 'Matina', 'Taxi', and 'Moskovich'. All varieties continued to yield fruit until the last week of August. 'Marglobe', 'Scotia', and 'Orange Blossom' had the highest yield, while 'Hillbilly Potato Leaf' and 'Striped German' yielded the least. Fruit size ranged from 1.5 ounces for P20-3-1 to 15 ounces for 'Brandywine Pink' and 'Striped German'. In addition to the lowest yield, 'Striped German' and 'Hillbilly Potato Leaf' had the fewest fruit, with 37 and 38 respectively. 'Bonito Ojo' produced the most fruit, 879, followed by 'P20-3-1' with 600. The trial included 14 small-fruited varieties (average fruit weight < 4 ounces). Of these 'Bonito Ojo' produced the most fruit by count while 'Scotia' produced the most fruit by weight. Twenty-five varieties had medium-sized fruit averaging 4-8 ounces. 'Marglobe' was the highest-producing medium-fruited variety by both count and weight. Twelve varieties produced large to very large fruit averaging 8-16 ounces. 'Biltmore' was the top producer in this category. A variety was classified as early-season if the first harvest occurred on or before July 21 and the peak harvest occurred on or before August 16. Of the 16 early-season varieties in the trial 9 had small fruit, 5 had medium fruit, and 2 – Cherokee Purple and Rose – had large fruit. 'Scotia' was the most productive by weight while 'Bonito Ojo' produced the most fruit. Mid-season varieties had a first harvest date of July 19-21 with a peak harvest of August 25 or a first harvest of July 22-30 and a peak harvest after August 15. Of the 17 mid-season varieties 4 had small fruit, 10 had medium fruit, and 3 had large fruit. 'Marglobe' was the most productive by weight and P20-3-1 produced the most fruit. Late-season varieties had a first harvest after August 1; of the 18 varieties 10 had medium fruit, 7 had large to very

large fruit, and one had small fruit. ‘Mountain Glory’ was the most productive by weight of the late-season varieties while ‘Gill’s All Purpose’ produced the most fruit.

Diseases: Early Blight, which is caused by *Alternaria solanii*, was the major limiting factor in the trial this season. The disease was first observed in the plot on the 9th of July. We rated on three separate dates using a 1-9 scale, where 1 represents a severely affected plant and 9 represents a plant that is unaffected. Varieties with the most resistance to leaf infection were Purple Calabash, Japanese Black Trifele, P20-3-1, and Nepal. Japanese Black Trifele and Purple Calabash suffered from fruit infection by mid-August; fruit of P20-3-1 and Nepal remained clean. The variety JTO-99197 had some leaf damage but the fruit remained clean. Powdery mildew appeared in the trial in late July and damage was evaluated on August 4. The varieties Hillbilly, Legend, Moskvitch, and Great White showed superior resistance to mildew. Gray mold caused by *Botrytis cinera* showed up in mid-July. Most varieties were resistant, but the fungus caused significant damage to Purple Calabash, Japanese Black Trifele (both strains) and Cherokee Purple. There was no sign of late blight in 2010. However, late blight data from 2009 is included for varieties that were tested that year. None of the varieties from 2009 were resistant to late blight but there were variations in tolerance. ‘Purple Calabash’, ‘Gill’s All Purpose’, and ‘NH Surecrop’ were the most tolerant varieties. Disease ratings are presented in table 2.

Recommendations: Information on seed sources and variety classifications are provided in table 3. *Red Fruited:* ‘Scotia’ and ‘Bonita ojo’ were the best of the small fruited varieties. ‘Bonita ojo’ was slightly earlier and higher yielding, but ‘Scotia’ was less susceptible to early blight. ‘Legend’ was the best of the early varieties with medium fruit. It ranked second behind ‘Moskovich’ for earliness but had 61% more fruit. ‘Legend’ is resistant to late blight and powdery mildew but is very susceptible to early blight. ‘Marglobe’ was the best of the mid-season varieties; it out-yielded ‘Legend’ and is tolerant of both early blight and powdery mildew. ‘Paragon’ was the best of the late varieties; JTO 99197 has better resistance to powdery mildew and early blight but doesn’t yield as well, and ‘Paragon’ does have fruit resistance to early blight. ‘Biltmore’ has the highest yield of the large-fruited varieties and was second for earliness and early blight tolerance. ‘Brandywine’ had less disease but only half the yield.

Other Colors: One variety worthy of note is the new high anthocyanin variety ‘Indigo Rose’ which we trialed as P20-3-1. This large cocktail tomato from Oregon State University has purple foliage and fruit which ripens to purple and scarlet. The early blight resistant plants are attractive enough to be used as ornamentals, and produce an abundance of fruit with an outstanding flavor reminiscent of Japanese plums. The burgundy-fruited varieties ‘Purple Calabash’ and ‘Japanese Black Trifele’ had excellent foliar resistance to late blight, although the fruit was susceptible. ‘Japanese Black Trifele’ yielded more but we preferred the flavor of ‘Purple Calabash’. The Johnny’s strain of ‘Japanese Black Trifele’ is slightly more tolerant of powdery mildew and gray mold than the Territorial strain. ‘Sunkist’ and ‘Orange Blossom’ were the best of the orange-fruited varieties. Both were developed at UNH; together they provide a full season of fruit.

Table 1

Variety	First Harvest	Peak Harvest	Yield (lbs.)	Fruit No.	Fruit Wt. (oz.)
830 700 890	July 26	August 25	61.4	93	10.5
Beaverlodge	July 21	August 16	62.6	303	3.3
BHN 589	July 26	August 25	77.9	179	6.9
BHN 876	July 28	August 16	65.6	200	5.3
BHN 961	July 28	August 20	90.5	205	7.0
Biltmore	July 26	August 25	80.1	151	8.4
Bonita ojo	July 19	August 4	92.9	879	1.7
Bonny Best	July 28	August 16	80.2	292	4.4
Brandywine	August 2	August 25	43.5	66	10.5
Brandywine Pink	August 4	August 13	57.3	60	15.1
Cherokee Purple	July 19	August 16	60.8	115	8.8
Copia	August 4	August 25	70.1	98	11.4
Cosmonaut Volkov	July 19	August 16	91.5	233	6.2
Fantastic F1	July 28	August 16	58.6	181	5.3
Frazier's Gem	July 26	August 20	70.4	205	5.4
Gill's All Purpose	August 2	August 20	63.8	281	3.6
Glacier	July 7	August 16	48.0	469	1.6
Golden Jubilee	August 2	August 27	61.1	138	7.4
Great White	July 19	August 25	66.9	104	10.4
Hillbilly Potato Leaf	August 6	August 25	30.1	38	12.7
Japanese Black Trifele	July 19	August 16	84.7	331	4.1
Japanese Trifele Black	July 26	August 16	97.5	353	4.4
JTO 99197 F1	August 4	August 25	70.2	194	5.8
Legend	July 16	August 16	74.4	279	4.3
Manitoba	July 21	August 16	77.4	427.5	2.9
Marglobe	July 26	August 25	121.0	428	4.5
Marion	August 6	August 25	65.6	183	5.9
Matina	July 13	August 16	68.7	529	2.0
Moskvich	July 13	August 13	55.0	173	5.1
Mountain Glory	August 2	August 16	106.2	248	6.9
Mr. Ugly F1	July 28	August 16	85.2	198	6.8
Nepal	August 6	August 25	63.0	156	6.7
NH Surecrop	July 26	August 16	95.4	423	3.6
Orange Blossom	July 16	August 16	110.2	300	5.8
Oregon Spring	August 2	August 18	65.2	247	4.3
Oroma	July 26	August 16	60.1	459	2.2
P20-3-1	July 21	August 25	55.6	600	1.5
Paragon	August 2	August 25	93.3	264	5.6
Prudens Purple	August 4	August 13	55.2	88	10.3
Purple Calabash	August 2	August 13	72.6	274	4.2
Rocky Top	July 19	August 25	62.4	151	6.6
Rose	July 21	August 13	66.2	106	10.3

Variety	First Harvest	Peak Harvest	Yield (lbs.)	Fruit No.	Fruit Wt. (oz.)
Rutgers	July 26	August 16	60.4	258	3.9
Saucy	July 13	August 13	66.2	440	2.4
Scotia	July 21	August 16	117.3	541	3.5
Silvery Fir Tree	July 16	August 16	76.8	316	3.8
Striped German	August 4	August 13	35.9	37	15.3
Sunkist F1	August 2	August 20	78.5	209	5.9
SVR 1400	August 4	August 16	53.6	72	11.8
Taxi	July 13	August 16	87.5	417	3.3
Valencia	August 6	August 25	59.2	189	4.9

Table 1. Yield data for 2010 tomato variety trial. All yields are based on 15 plants/variety; yields for BHN 961 and Manitoba have been adjusted.

Table 2

Variety	Powdery Mildew	Early Blight				Gray Mold	2009 Late Blight		
		July 13	July 22	August 5	Fruit		July 27	August 3	August 10
830 700 890	4.7	8.3	7.7	5.3	no	8.7			
Beaverlodge	2.7	4.3	3.0	1.7	yes	9.0	9.0	2.0	1.0
BHN 589	5.3	7.0	7.3	2.7	no	9.0			
BHN 876	5.7	5.7	5.7	1.7	no	8.7			
BHN 961	5.3	5.0	3.3	1.7	yes	9.0			
Biltmore	4.0	7.0	6.3	4.7	no	8.0			
Bonita ojo	4.0	8.0	3.0	1.0	yes	9.0	9.0	4.7	2.0
Bonny Best	3.3	7.7	6.3	2.7	no	9.0	7.3	3.0	0.3
Brandywine	7.3	4.3	4.3	5.3	no	9.0	9.0	5.7	1.3
Brandywine Pink	5.3	6.7	3.7	4.7	no	9.0	9.0	4.0	1.3
Cherokee Purple	3.7	8.7	8.7	3.7	yes	4.3	7.3	4.3	1.7
Copia	3.7	4.7	3.7	4.0	no	8.7			
Cosmonaut Volkov	4.3	5.7	3.7	2.3	no	9.0			
Fantastic F1	6.0	6.7	3.3	1.7	yes	9.0	9.0	3.7	1.3
Frazier's Gem	4.3	6.0	5.7	4.3	no	7.0	9.0	4.7	1.7
Gill's All Purpose	3.3	7.0	5.7	3.0	yes	9.0	9.0	7.0	2.0
Glacier	1.3	7.7	4.7	1.7	no	9.0	7.5	3.0	0.5
Golden Jubilee	5.0	8.0	6.0	2.7	no	9.0	9.0	5.0	1.3
Great White	5.3	7.0	7.0	5.3	yes	9.0	7.3	4.3	1.3
Hillbilly Potato Leaf	8.3	6.0	4.3	4.3	no	9.0	8.3	4.7	1.0
Japanese Black Trifele	4.3	9.0	9.0	8.0	yes	3.3	8.7	4.3	0.7
Japanese Trifele Black	5.0	9.0	9.0	8.0	yes	6.0			
JTO 99197 F1	3.7	8.7	6.7	5.0	no	9.0	9.0	4.7	1.0
Legend	7.0	4.7	3.0	1.3	yes	8.7			
Manitoba	2.0	7.0	2.5	1.5	yes	7.5	9.0	4.3	0.7
Marglobe	4.0	7.0	6.7	4.7	no	9.0	8.3	5.7	1.3
Marion	5.0	5.0	4.7	5.7	no	9.0	8.7	6.3	1.7

Variety	Powdery Mildew	Early Blight				Gray Mold	2009 Late Blight		
Matina	2.3	4.3	4.7	2.0	yes	9.0	9.0	6.0	2.3
Moskvich	7.7	5.0	3.7	3.3	no	9.0	7.3	4.3	1.0
Mountain Glory	3.7	5.7	4.7	3.0	no	7.3			
Mr. Ugly F1	3.0	6.0	4.0	2.7	no	9.0	8.3	5.0	1.3
Nepal	5.0	7.3	8.0	6.3	no	9.0	8.3	5.0	1.7
NH Surecrop	4.3	6.0	7.3	2.7	yes	9.0	9.0	6.7	2.3
Orange Blossom	4.7	5.7	4.0	2.3	no	9.0	8.3	3.0	1.0
Oregon Spring	4.7	8.0	7.0	3.7	yes	8.7			
Oroma	2.7	5.7	3.3	3.3	no	9.0			
P20-3-1	4.3	9.0	9.0	7.7	no	9.0			
Paragon	5.7	4.7	5.0	4.3	no	9.0	8.0	3.7	1.0
Prudens Purple	5.7	6.7	4.7	4.0	no	9.0	9.0	5.7	1.3
Purple Calabash	3.0	9.0	8.7	8.3	yes	3.3	9.0	7.3	2.3
Rocky Top	5.0	3.7	3.0	2.7	yes	9.0			
Rose	5.3	5.3	4.7	4.0	no	8.3	9.0	4.5	1.0
Rutgers	5.3	6.0	4.0	3.3	no	9.0	9.0	4.7	1.7
Saucy	3.3	5.3	4.7	3.0	no	8.7			
Scotia	2.3	8.0	6.3	3.0	yes	9.0	8.7	2.3	0.7
Silvery Fir Tree	4.0	8.3	4.7	1.0	yes	9.0	9.0	2.7	1.0
Striped German	7.0	5.0	4.0	5.3	yes	9.0	9.0	6.0	1.7
Sunkist F1	3.7	5.7	5.7	4.3	no	8.3			
SVR 1400	4.0	7.3	5.3	4.3	yes	9.0			
Taxi	4.3	7.3	3.3	4.0	yes	9.0	8.3	3.7	1.0
Valencia	3.7	7.3	3.3	4.7	no	9.0	9.0	6.0	1.3
LSD	**3.2**	**2.3**	**2.9**	**2.5**	**n/a**	**1**	**2.1**	**1.7**	**0.6**

Table 2. Disease response data for the tomato trial. Response was quantified using a 1-9 scale where 9 indicates no disease. Response values that differ by more than the LSD value for that column are significantly different. Late blight data is from 2009; varieties with no data were not included in the 2009 trial.

Table 3

Variety	Source	Fruit Type	Maturity	Variety Type	Comments
830 700 890	Siegers	large red	mid-season	EXP	dense foliage and many branches
Beaverlodge	Territorial	small red	early	OP	organic seed
BHN 589	Siegers	medium red	mid-season	F1	determinate; leggy plant with profuse branching
BHN 876	Rupp	medium orange	mid-season	F1	fruit prone to cracking; excellent flavor
BHN 961	Rupp/Siegers	medium red	mid-season	F1	
Biltmore	Siegers	large red	late	F1	determinate
Bonita ojo	Territorial	small red	early	OP	organic seed; compact high yielding plant; fruit similar to large cherry
Bonny Best	Totally Tomatoes	medium red	mid-season	OP	yellow-green plant, not productive
Brandywine	Johnny's	large red	late	OP	beefsteak
Brandywine Pink	Hart	very large pink	late	OP	beefsteak; fruit much larger than Brandywine
Cherokee Purple	Johnny's	large burgundy	mid-season	OP	beefsteak
Copia	High Mowing	large mottled	late	OP	organic seed; yellow and red mottled beefsteak
Cosmonaut Volkov	High Mowing	medium red	early	OP	organic seed
Fantastic	Territorial	medium red	mid-season	F1	beefsteak
Frazier's Gem	Territorial	medium red	mid-season	OP	organic seed; dense, compact plant
Gill's All Purpose	Territorial	small red	late	OP	organic seed; early maturity in Oregon, may be heat-sensitive
Glacier	Territorial	small red	very early	OP	produced ripe fruit for 7 weeks
Golden Jubilee	Totally Tomatoes	medium yellow	late	OP	strong plant
Great White	Johnny's	large pale yellow	mid-season	OP	very indeterminate
Hillbilly Potato Leaf	Rupp	very large mottled	late	OP	beefsteak, not productive
Japanese Black Trifele	Territorial	medium burgundy	early	OP	striped, pear-shaped fruit
Japanese Trifele Black	Johnny's	medium burgundy	mid-season	OP	later and better yielding than Territorial strain
JTO 99197	Johnny's	medium red	late	F1	determinate
Legend	Oregon State	medium red	early	OP	determinate, tolerant to late blight, parthenocarpic.
Manitoba	Territorial	small red	early	OP	determinate
Marglobe	Hart	medium red	mid-season	OP	determinate
Marion	Totally Tomatoes	medium red	late	OP	compact plant with dense, bluish-green foliage
Matina	Territorial	small red	early	OP	fruit in large bunches

Variety	Source	Fruit Type	Maturity	Variety Type	Comments
Moskovich	Johnny's	medium red	early	OP	
Mountain Glory	Rupp	medium red	late	F1	few flowers/fruit in early July
Mr. Ugly	Rupp	medium red	mid-season	F1	beefsteak; prone to blossom end rot; dark green foliage.
Nepal	Johnny's	medium red	late	OP	beefsteak
NH Surecrop	Territorial	small red	mid-season	OP	severe yellowing of lower leaves
Orange Blossom	Johnny's	medium orange	early	F1	determinate, developed at UNH, some blossom end rot
Oregon Spring	Oregon State	medium red	late	OP	very early in Oregon, may be sensitive to heat
Oroma	Oregon State	small red	mid-season	OP	roma type; heavy producer but prone to blossom end rot
P20-3-1	Oregon State	small purple	mid-season	OP	unique purple and red large cherry; high anthocyanin; purple foliage
Paragon	Johnny's	medium red	late	OP	determinate
Prudens Purple	Johnny's	large red	late	OP	beefsteak, similar to Brandywine
Purple Calabash	Territorial	medium burgundy	late	OP	excellent flavor; distorted fruit
Rocky Top	Siegers	medium red	mid-season	F1	limited branching
Rose	Johnny's	large red	early	OP	beefsteak, similar to Brandywine but much earlier; susceptible to blossom end rot
Rutgers	Burpee	medium red	mid-season	OP	large plant, not productive
Saucy	Oregon State	small red	early	OP	determinate, plum type
Scotia	Territorial	small red	early	OP	determinate, heavy yield
Silvery Fir Tree	Territorial	small red	early	OP	organic seed; compact determinate plants with unusual fern-like silver leaves
Striped German	Johnny's	very large mottled	late	OP	Attractive yellow and red marbled fruit but low yield and poor flavor
Sunkist	High Mowing	medium orange	late	F1	organic seed; fruit attractive and flavorful. Developed at UNH
SVR 1400	Rupp	large red	late	EXP	bluish-green foliage and minimal branching
Taxi	Johnny's	small yellow	early	OP	determinate; heavily branched
Valencia	Johnny's	medium orange	late	OP	beefsteak

Table 3. Seed sources, variety classifications, and general comments. P20-3-1 is being released as ‘Indigo Rose’ by Oregon State University in 2011.

Late Blight Resistant Tomatoes

In 2010 we trialed 5 tomato varieties which are marketed as being highly tolerant of or resistant to late blight. We did not evaluate the varieties for late blight but did evaluate them for infection by early blight and powdery mildew and for fruit characteristics. 'Red Pearl' and 'Legend' were seeded in March and transplanted into the field the last week of May. 'Mountain Magic', 'Plum Regal' and JTO110 were seeded in late May and transplanted in July. The varieties and their performance are detailed in the following list.

- Legend: An early medium red slicing tomato developed at Oregon State University and distributed by Territorial Seeds. Legend is highly tolerant, though not resistant, to late blight races US8 and US11 and to powdery mildew. It ranked third in its size class for yield in our trials, despite developing severe early blight on foliage and fruit.
- Mountain Magic: A large red cocktail/truss tomato developed at North Carolina State University, distributed by Bejo Seeds, and available from Johhny's. 'Mountain Magic' has proven resistant to late blight even under the severe disease pressure common in the Southeast. In our trial the vigorous, indeterminate plants developed only minimal early blight, septoria leafspot, and powdery mildew despite not being staked. The fruit had excellent flavor and remained free of disease, although there was some splitting after heavy rains – a common problem in cocktail tomatoes.
- Plum Regal: A large, late maturing roma-type tomato developed at North Carolina State University and distributed by Bejo Seeds. The determinate plants developed moderate levels of early blight and powdery mildew. 'Plum Regal' had severe problems with fruit rot in our trial, possibly due to sunscald.
- Defiant PhR: A new hybrid mid-size red slicer developed and distributed by Johnny's that has high resistance to late blight courtesy of the Ph-2 and Ph-3 major genes. We trialed it as JTO110; the determinate plants developed moderate levels of early blight which did affect the fruit. However, our trial was planted very late and it is possible that the fruit would normally mature before fruit rot became a problem.
- Red Pearl: A red grape tomato with intermediate resistance to late blight released by Johnny's in 2010. This variety showed strong resistance to powdery mildew and early blight in our trials, and was the last variety to retain green foliage. The fruit have outstanding flavor, crack much less than other grape tomatoes, and do not develop fruit rot.

Red Pearl photographed September 20. All other varieties transplanted in May had stopped producing marketable fruit by September 1.

Mountain Magic fruit and plants photographed September 20. This was the second harvest for Mountain Magic, which had ripe fruit ~90 days after seeding.

JTO110 Plants and fruit photographed September 20. Note concentrated fruit ripening.

Plum Regal plants and fruit.

Potatoes

We trialed 24 potato varieties in 2010; the range of types included fingerlings, eastern white potatoes, red potatoes, yellow potatoes, and some even more exotic (table 1). Skin colors included yellow, brown, pink, red, and purple. Flesh colors included white, yellow, and purple. The potatoes were planted the week of May 16 with 12-15 seed pieces in a 10 ft plot and 30 inches between rows. We planted 17 varieties in both irrigated and rainfed plots; the remaining 8 were planted only in the irrigated plot because of limited seed supply. Most of the seed potatoes were purchased from Ronniger's Potato Garden in Colorado. The seed potatoes for 'Satina' and 'Purple Sun' were purchased from The Maine Potato Lady in Guileford, ME. Emergence data was collected 3 weeks after planting. The primary pest problem in 2010 was Colorado Potato Beetles. The irrigated plots were sprayed once with a mixture of spinosad and neem oil; the rainfed plot was not sprayed. We also observed browning and curling (scorching) of leaves in some varieties which was probably early blight complicated by potato beetle feeding. 2010 was not a good year for potatoes, despite the absence of late blight; tubers were generally small and yields low.

Variety	Type	Skin Color	Flesh Color	Maturity
Atlantic	round white	light brown	white	Mid
Austrian Crescent	fingerling	yellow	yellow	Mid
Banana Fingerling	fingerling	yellow	white	Mid
Butte	russet	brown	white	late
Carola	yukon gold type	yellow	yellow	late
Dazoc	red	red	white	early
Desiree	red	pink	gold	Mid
French Fingerling	fingerling	red	yellow+pink	Mid
Katahdin	long white	light brown	white	late
Kennebec	round white	light brown	white	Mid
Keuka Gold	yukon gold type	yellow	yellow	Mid
Maris Piper	round white	yellow	cream	Mid
Nicola	fingerling	light brown	cream	late
Ozette	fingerling	brown	yellow	late
Purple Majesty	specialty	purple	purple	early
Purple Sun	specialty	purple	yellow	mid
Purple Viking	specialty	purple	white	early
Rio Colorado	red	red	white	Mid
Romanze	red	red	yellow	Mid
Rose Finn	fingerling	pink	cream	Mid
Sangre	red	red	white	Mid
Satina	yukon gold type	yellow	yellow	early
Shepody	round white	light brown	cream	Mid
Yellow Finn	yukon gold type	light brown	yellow	Mid

Table 1: Variety descriptions.

Irrigated Trial (Table 2): 'Atlantic' was the highest-yielding variety in the irrigated trial; this round white potato is a traditional variety in southern New England. 'Atlantic' also had excellent emergence, only mild CPB damage, and moderate leaf scorching by early blight. 'Banana', also known as 'Russian Banana', had the highest yield of the fingerling potatoes. Emergence was good, although there was only one sprout per seed, and the variety did

not have problems with either CPB or early blight. 'Ozette' also performed well, although yields are lower than for 'Banana'. Of the other 4 fingerling varieties, 'French Fingerling' had very poor emergence and the remainder were severely damaged by early blight and CPB. None of the red potatoes yielded particularly well, primarily because of emergence problems. However, only 'Dazoc' suffered from severe early blight and CPB damage. The purple-skinned varieties yielded better than the red potatoes, although 'Purple Viking' had poor emergence and the remaining varieties were severely defoliated by CPB. 'Keuka Gold' was the best of the yellow-fleshed, Yukon Gold-type potatoes. It was third overall for yield, had only moderate CPB damage and very little early blight.

Variety	Emergence	CPB Damage	EB Damage	Yield (lbs/10 ft)	Notes
Austrian Crescent	excellent	extensive	severe	7.5	
Banana Fingerling	good	mild	mild	11.5	only 1 sprout/seed
French Fingerling	very poor	mild	mild	7	those that sprouted did well
Nicola	fair	moderate	severe	7.5	Japanese beetles; weeds
Ozette	good	mild	mild	7.5	compact
Rose Finn	excellent	extensive	severe	2.5	very compact
Katahdin	very good	mild	mild	8.5	
Dazoc	good	extensive	severe	4.5	flea beetles; short plants
Desiree	fair	mild	mild	4	small sprouts
Rio Colorado	poor	mild	mild	4	few sprouted; appeared heat stressed
Romanze	poor	mild	mild	3.5	few sprouts, late
Sangre	poor	mild	mild	5.5	healthy
Atlantic	excellent	mild	moderate	17	compact
Kennebec	poor	moderate	mild	4.5	flea beetles; generally unhealthy
Maris Piper	fair	mild	mild	10.5	only 50% sprouted; early
Shopody	very good	mild	severe	10.5	
Butte	fair	moderate	moderate	14.5	50% sprouted well
Purple Majesty	excellent	severe	unknown	8	early
Purple Sun	very good	extensive	severe	9.5	
Purple Viking	poor	mild	moderate	9	compact and early
Carola	poor	mild	bad	4	few sprouts but strong
Keuka Gold	very good	moderate	mild	12.5	compact
Satina	very good	moderate	bad	8.5	only 1 sprout/seed; something broke main stems
Yellow Finn	excellent	mild	mild	4	some flea beetles

Table 2. Emergence, yield, and damage from Colorado Potato Beetle (CPB) and Early Blight (EB) for irrigated trial plots.

Rainfed Trial (Table 3): Yields were significantly lower in the rainfed trial, only 3.7 lbs per 10 feet of row as compared to 7.3 pounds for the irrigated trial. 'Satina' had the highest yield, followed by 'Banana Fingerling'; on a per-foot basis the yields of these two varieties were very close. 'French Fingerling' and 'Atlantic' had the second-highest yield, although 'Atlantic' had only 1/3 the yield it produced with irrigation. Colorado Potato Beetle took longer to infest the rainfed trial, and the trial was not sprayed to control the beetles. Nevertheless, the varieties 'Sangre', 'Ozette', and 'Banana Fingerling' had only CPB damage. These varieties may have some tolerance to both CPB and early blight.

Variety	Emergence	CPB Damage	EB Damage	Plot length (ft)	Yield (lb)	Notes
Rio Colorado	very poor	extensive	unknown	30	9.18	poor quality seed?
Nicola	excellent	extensive	unknown	30	10.41	100% defoliation
French Fingerling	excellent	extensive on some	mild	30	16	variable
Sangre	good	mild	mild	10	n/a	not harvested?
Romanze	very poor	moderate	unknown	30	1.13	most seed didn't sprout
Satina	excellent	moderate	moderate	30	19.5	
Yellow Finn	excellent	moderate	severe	30	6	low yield
Banana Fingerling	good	mostly mild	mild	25	16.5	variable CPB
Austrian Crescent	good	extensive	moderate	30	6.08	
Ozette	fair	mild	mild	30	10.5	weak, stunted plants
Purple Sun	excellent	extensive	severe	20	10.3	all dead by 7/28
Desiree	fair	moderate	moderate	30	14	much seed didn't sprout
Rose Finn	excellent	extensive	unknown	30	2.7	mostly dead by 7/28
Atlantic	poor	moderate	mild	30	17.5	
Purple Majesty	fair	moderate	mild	10	6	some seed didn't sprout
Purple Viking	poor	extensive	unknown	30	12	much seed didn't sprout

Table 3. Emergence, yield, and damage from Colorado Potato Beetle (CPB) and Early Blight (EB) for rain-fed trial plots.

Slicing Cucumbers

Fourteen mildew-resistant slicing varieties were evaluated for fruit quality, disease resistance, and general performance. The field was partly fallow and partly in corn in 2009 and was not cover cropped.

Production Methods: The plants were started in plug trays in the greenhouse and transplanted to raised beds with black "plastic" mulch and drip tape on June 1, 5 weeks after seeding. Spacing was 1 foot between plants with 1 row per bed. Weeds were controlled by hand pulling and rototilling between the beds. Nitrogen fertilizer was applied as ammonium sulfate through the drip system. The transplants were taller than ideal, resulting in problems with stem burn where the stems contacted the edge of the mulch and significant loss of transplants in some varieties (table 1). 'Diva', 'Thunderbird' and 'Dominator' were the worst affected. Cucumbers were harvested by hand thrice weekly from July 6 until August 5. Yield data was collected on July 6, July 19, and July 30 (table 2).

Insect and Disease Issues: The primary insect problem was cucumber beetles, and the primary disease problem was bacterial wilt. No powdery mildew was found on any of the varieties. The cucumber beetles emerged on June 17 and remained problematic throughout the season despite repeated applications of PyGanic. The beetles hid under the cornstarch-based "plastic" mulch at night, making it difficult to control them with low-residual insecticides. Immature spotted cucumber beetles feed on corn roots, so the population may have been particularly high in the field. By July 12, all 14 varieties showed symptoms of bacterial wilt, although some varieties were less affected than others. Table 1 details bacterial wilt observations for each variety. The cucumber beetles also damaged fruit directly, causing scaring and distortion. The variety 'Yaniv' suffered the most from bacterial wilt, with greater than 25% of the plants killed. Other varieties with severe wilt were 'Diva', 'Socrates', and 'Sultan'. 'Green Finger' had extensive cucumber beetle damage on the fruit, but only one plant with wilt symptoms, suggesting that it may be resistant. 'SR2389CW' suffered moderate wilt damage but recovered well, with only one plant killed. This variety also survived transplant with no losses. 'Marketmore 76', 'Olympian' and 'Impact' had minimal wilt damage, suggesting either resistance or a lack of preference for these varieties on the part of the beetles.

Yield: Fruit was harvested at 6-9" long and graded into marketable and unmarketable. Varieties were harvested separately and weighed on three dates representing early season, mid-season and late season (table 2). Yields have been adjusted for the initial number of plants to permit direct comparison among varieties. Fruit uniformity was rated from poor to excellent and defects were noted. 'Marketmore 76' and 'SR2389CW' had the best yield with large fruit of excellent quality. Other varieties with good production were 'Speedway' and 'Impact'. 'Socrates' and 'Olympian' had respectable yields but the fruit was bulbous and distorted. 'Diva' had nice fruit quality but low yields, partly due to heavy losses to transplant failure and wilt.

Recommendations: Based on the results of this trial the old standby 'Marketmore 76' remains an excellent choice for growers, although it is a late variety and the fruit matures very rapidly so diligent harvesting is necessary. 'Speedway' or 'Genuine' would be good choices for earlier varieties although 'Genuine' succumbed to wilt after only a few weeks of harvest. The experimental variety SR2389CW would be a good choice for season-long production as it has excellent quality and yielded well both early and late in the season.

Table 1. Disease Data

Variety	Transplant Losses	Death from Bacterial Wilt	Notes
Diva	15%	19%	Poor transplant recovery. Extensive wilt damage throughout.
Dominator	10%	11%	Poor transplant recovery. Extensive wilt damage throughout crop.
Genuine F1	0%	7%	Bacterial wilt present throughout crop.
Green Finger	4%	2%	Extensive damage to fruit by cucumber beetle.
Impact	3%	5%	
Indy F1	8%	14%	Poor transplant recovery.
Marketmore 76	0%	7%	Minimum wilt damage.
Olympian F1	0%	4%	Minimum wilt damage.
Socrates F1	6%	24%	Extensive wilt damage throughout crop.
Speedway	1%	7%	
SR2389CW	0%	1%	Moderate wilt damage, yet good recovery.
Sultan F1	6%	18%	Extensive wilt damage throughout crop.
Thunderbird	12%	8%	Poor transplant recovery.
Yaniv F1	6%	27%	Most plants severely hindered by wilt.

Table 2. Yield Data (lbs.) and Production

Variety	First Harvest July 6	Mid-season July 19	Late-season July 30	Fruit Uniformity	Seed Source	Notes
Diva	0.2	8.6	0	Good	Johnny's	Late
Dominator	6.8	14	1	Inconsistent	Sieger	Small plants. Inconsistent fruit size.
Genuine F1	11.9	14	0	Very Good	Johnny's	Early. Good producer until succumbed to wilt.
Green Finger	0.2	10.5	6.3	Inconsistent	High Mowing	Bulbous fruit.
Impact	0	24.4	9	Good	Sieger	Consistent fruit color, shape & size.
Indy F1	5	13.3	4.7	Poor	Rupp	Small plants. Curved, bulbous fruit.
Marketmore 76	0	48.1	14.4	Excellent	High Mowing	Fruit matures quickly
Olympian F1	1.4	27.8	7.7	Inconsistent	Johnny's	Small plants. Tendency to produce bulbous, curved fruit.
Socrates F1	15.4	28.1	4	Poor	Johnny's	High production of bulbous fruit.
Speedway	9.4	27.4	8.1	Good	Sieger	Small plants and fruit.
SR2389CW	6.2	34.5	12	Excellent	Rupp	Quality sizable plants and fruit.
Sultan F1	1.7	16.2	0	Poor	Johnny's	Small plants with low quality fruit.
Thunderbird	0	18.8	2.1	Good	Rupp	Consistently nicely shaped fruit.
Yaniv F1	0	6	0	Poor	High Mowing	Inconsistent fruit production and quality.

Carrots

In 2010 we trialed 10 carrot varieties for yield, quality, Cercospora leaf spot resistance, and storage quality. The carrots were planted on a raised bed to facilitate deep rooting and long, straight roots. The trial was hand seeded on May 17th into three rows per variety on a 30-inch bed. Fertilizer was incorporated during bed formation. Weeds were controlled by hand, with the worst weed pressure occurring in the last week of June. No fungicides or insecticides were applied. The only disease problem was Cercospora leaf spot, which appeared the first week of September and caused extensive foliar damage in some varieties. The carrots were hand-dug on September 14, topped in the field, and packed in plastic bags. After harvest the carrots were stored in a cooler at 45° F. Storage quality was evaluated in January 2011 after 4 months in cold storage.

Top Growth (table 1): The variety Enterprise had the best germination and seedling vigor. The varieties Negoria, Ya-ya, Maverick, Nectar, and Purple Haze had relatively poor germination. Nectar and Negoria were strong growers despite their poor germination but Yaya, Maverick and Purple Haze had small tops and poor canopy cover and competed poorly with weeds. In contrast, Enterprise and Bolero had excellent weed tolerance. Maverick had the best Cercospora resistance, with almost no disease. The purple varieties Dragon and Purple Haze were highly susceptible to Cercospora. Purple Haze also suffered from excessive bolting. The only other variety with any bolting was Sugarsnax 64, which had 2 plants that bolted.

Yield (table 2): 'Dragon' had the highest yield; it produced large, purple-skinned roots which were quite uniform. Even with the raised bed the roots pushed out of the ground. 'Enterprise' had the best yield of the orange-skinned varieties. It produced nice tapered roots of varying lengths. 'Nectar' also yielded well, despite poor germination, and had nice root quality. 'Sugarsnax 64' and 'Maverick' were the best for long, thin roots. After 4 months in storage 'Nectar' and 'Purple Haze' had the best flavor. 'Sugarsnax 64' and 'Dragon' had become bitter, and 'Dragon' was woody. The remaining varieties were acceptable but not outstanding. All of the varieties remained crisp with no sign of rot, although 'Purple Haze', 'Yaya', 'Dragon' and 'Maverick' had significant regrowth of tops and adventitious roots. 'Bolero' showed the least regrowth.

Recommendations: 'Enterprise', 'Nectar' and 'Bolero' combined good to excellent competitive ability with moderate Cercospora resistance and nice roots. 'Nectar' has the best storage quality of these varieties. 'Dragon' was a pretty and vigorous purple carrot, but we were not impressed with its flavor either fresh or after storage. It would need to be sprayed to prevent leafspot as it is very susceptible. 'Purple Haze' was superior to 'Dragon' in eating quality but suffered from poor germination and a tendency to bolt as well as low yields and leafspot. Growing carrots on a raised bed resulted in large, straight roots but made weeding difficult. We would not recommend using raised beds without herbicides unless weed pressure is generally low, and even then varieties with high competitive ability should be grown.

Variety	Source	Germination	Competitive Ability	Top Growth	Cercospora leaf spot
Enterprise	Rupp	excellent	excellent	Healthy, uniform growth	6
Suagrsnax 64	Sieger	moderate	good	strong, bushy, bright green. Some bolting	4
Dragon	High Mowing	good	good	tall, robust, red-tinged, fuzzy petioles	1
Negovia	Johnny's	poor	good	Small, short, deep green.	3
Ya-Ya	High Mowing	poor	poor	short, not vigorous	4
Maverick	Sieger	poor	poor	short, moderate vigor	8
Nectar	Johnny's	poor	good	strong, bushy, good cover	6
Necoras	High Mowing	moderate	good	healthy, bushy bright green	4
Purple Haze	Johnny's	poor	good	compact growth, red-tinged foliage. Extensive bolting.	2
Bolero	Johnny's	moderate	excellent	strong, bushy growth	5

Table 1. Foliar characteristics of carrot varieties. Cercospora leafspot tolerance was rated on a 1-9 scale with 9 indicating no disease.

Variety	Root Color	Root Quality	Yield (lbs.)	Storage Quality
Enterprise	orange	tapered, variable length	115.5	Moderate
Suagrsnax 64	orange	long, lean and tapered with good uniformity	68	poor
Dragon	purple skin with orange flesh.	Very large and thick, pushing out of ground. Uniform.	125.5	Very poor
Negovia	orange.	Very large and uniform.	68	Moderate
Ya-Ya	orange.	Blunt tips. Lacked uniformity	65	Moderate
Maverick	orange.	Roots very long (>16") but not uniform, hard to harvest	72	poor
Nectar	orange.	Stubby, tapered roots not uniform but easy to harvest.	92	excellent
Necoras	orange.	Massive roots. Tendency to splitting and side nodules.	99	n/a
Purple Haze	purple skin and cortex, orange core.	Roots small and tough.	36	good
Bolero	orange.	Some crooked roots. Stout, blunt tips, easy to harvest but not uniform.	65.5	good

Table 2. Carrot root characteristics and yield.

Cabbage

We evaluated the performance of 8 cabbage varieties for fall harvest. The trial was hand-seeded on May 12 with 12 inches between plants and 30 inches between rows. Synthetic fertilizer was banded prior to planting at recommended rates. Weeds were controlled by cultivating and hand weeding. Irrigation was supplied as needed from sprinklers. Germination and flea beetle damage were evaluated 3 weeks after seeding and Sevin was applied to control flea beetles. Cabbage worm damage from both imported cabbage worm and cabbage looper was rated on June 30; the trial was sprayed with spinosad in mid-July when larvae became problematic despite extensive parasitism. Japanese beetle damage was evaluated July 26. Hot, humid weather, particularly during the last week of August, led to sunburn damage to the tops of the heads and extensive infection by Alternaria and other fungi.

The napa cabbage variety 'Minuet' was particularly attractive to flea beetles and Japanese beetles; the European-type varieties had little damage from Japanese beetles. The variety 'Tendersweet' was particularly attractive to cabbage worms. This variety also had large, flat heads which were difficult to handle when wet. 'Minuet' suffered less from bacterial rot than older napa varieties we have grown in the past, but we still lost 30% of the heads. The red cabbage 'Buscaro' had extremely poor germination; we are unsure if this is due to seed quality or to pooling water from the water reel. 'Tendersweet', and 'Caraflex' also suffered from poor germination while 'Rona' was very uneven in germination and maturity. 'Ultima Vantage' had the best yield despite moderate damage from cabbage worms and Japanese beetles. 'Storage #4' also yielded well and had less damage from cabbage worms. Both of these varieties had only minimal damage from sunburn and fungi. 'Blue Dynasty' was extensively damaged by sunburn. We recommend 'Storage #4' and 'Ultima Vantage' as the best of these varieties for fall harvest from direct seeding.

Variety	Type	Germination	Flea beetle damage	Cabbage worm damage	Plant Growth	Japanese beetle damage
Caraflex	early pointed green	spotty	slight	moderate	robust, no thinning needed	minimum
Minuet	napa	very good	extensive	minimum	robust	extensive
Rona	round red	poor, uneven	slight	minimum	ornamental, airy growth = weedy plot.	minimum
Blue Dynasty	round blue	moderate; uneven	Slight to extensive	minimum	petite plants	minimum
Ultima Vantage	round green	excellent	minimum	moderate	compact growth	moderate
Tendersweet	flathead green	poor	n/a	extensive		minimum
Storage #4	round green	good	n/a	minimum	small plants	moderate
Buscaro	round red	very poor	n/a	---	Failed crop	---

Table 1. Plant growth and insect damage results for cabbage trial.

Variety	Source	Heading	Yield (lbs)	Harvest date and notes
Caraflex	Johnny's	uniform	78	August 10, beginning to split and rot
Minuet	Johnny's	some plants with multiple or no heads	93.5	August 10. Lots of rot; 4 plants failed to head
Rona	Rupp	Beautiful plants, small/late heads	52	September 9.
Blue Dynasty	Sieger	small heads, uniform	52	September 9.
Ultima Vantage	Rupp	uniform	169	September 9.
Tendersweet	Johnny's	nice, oval heads, uniform	124	August 18, beginning to split and rot
Storage #4	Johnny's	uniform small, late heads	124	September 9.
Buscaro*	High Mowing	----	3	September 9. Only 3 small heads

Table 2. Yield and head characteristics for cabbage trial.

Peppers

We trialed 14 varieties of sweet peppers and two hot peppers for performance under Rhode Island conditions. The peppers were grown on a raised bed covered with cornstarch-based Mater-Bi black mulch; water and fertilizer were supplied through drip irrigation. The peppers were started in the greenhouse and transplanted to the field on May 23. No significant insect problems occurred on the peppers. The only disease problem was soft rot caused by a variety of bacteria. Some varieties had problems with sunscald.

The Mater-Bi mulch was effective at controlling weeds and maintaining warm, moist soil conditions. It held up well throughout the season except where the coyotes dug into it in search of voles, who were attracted to the moisture in the drip irrigation tubing. The best varieties for standard green bell peppers were King Crimson and Hunter. Flavorburst was very pretty with a good yield of chartreuse fruit that ripened to yellw-orange, although it had a tendency to sunburn. Ace, Aristotle, and Yankee Bell gave good yields of green peppers but the fruit could not be left to turn red because of susceptibility to soft rot. Italia was an excellent green-to-red Italian frying pepper although the tips of the fruit tended to sunburn. Atris was also good, although it was late and had a tendency to lodge. Sweet Chocolate was beautiful and superior to Brownie as a brown frying pepper. It had essentially no soft rot, so could be left on the plant to mature. Apple was outstanding as a red pimento pepper, far superior to Lipstick. Both Don Picoso and Early Jalapeno did well, with good heat, high yields, and no disease.

Variety	Source	Type	Immature Color	Mature Color	Sunscald	Soft Rot	Lodging	Notes
Flavorburst	Johnny's	bell	chartreuse	orange	Severe in July, minimal later	mild	none	early, large, uniform fruit, good yield
Ace	Johnny's	bell	medium green	red	moderate	severe	moderate	early, floppy plants with poor canopy coverage
King Crimson	High Mowing	bell	dark green	red	mild	moderate	moderate	high yield
Aristotle	Sieger	bell	bright green	red	moderate	severe	none	low yield, sturdy plants, large, thick-walled fruit
Red Knight	Johnny's	blocky bell	bright green	red	mild	mild	none	late, sturdy plants but low yield, nice large bells
Yankee Bell	Johnny's	blocky bell	medium green	red	mild	severe	moderate	mid-season, consistent fruit size
Hunter F1	Rupp	blocky bell	bright green	red	none	moderate	moderate	late, large fruit born high on large plants

Variety	Source	Type	Immature Color	Mature Color	Sunscald	Soft Rot	Lodging	Notes
Brownie	Rupp	Itallian	yellow-green	brown	mild	severe	moderate	Small fruit, rots instead of coloring
Italia	Johnny's	Italian	green	red	severe - tips	mild	moderate	early, good yield, lower fruit touch ground
Atris	High Mowing	Italian	green	red	mild	none	severe	late, heavy yield
Sweet Chocolate	Johnny's	Italian	green	chocolate red	mild	mild	none	very early, excellent yields but fruit size inconsistent. Long peduncles.
Carmen	Johnny's	Italian	yellow-green	red	severe	severe	severe	early, yields well, needs staking
Early Jalapeno	Johnny's	jalapeno	bright green and purple	red	none	none	moderate	late, heavy yield with nice corking
Apple	Johnny's	pimento	bright green	red	very mild	None until Sept.	mild	early, good canopy cover
Lipstick	Johnny's	pimento	bright green	red	mild	moderate	severe	high yield, needs staking, fruit not uniform
Don Picoso	Sieger	serrano	green	red	none	none	none	heavy yield of 3" fruit. Best harvested green

Winter Squash

The 2010 winter squash variety trial consisted of 16 varieties. The trial was hand seeded using 5 foot x 5 foot spacings on May 27. Fertilizer (15-15-15 + lime) was banded in the rows prior to seeding. No irrigation was available. We were unable to use herbicide as there was no rainfall in the week following seeding, so weeds were controlled by cultivating until the vines ran and then by hand weeding. The 3-acre field was quite weedy by the end of the season. The primary insect problem was cucumber beetles which caused significant damage despite application of endosulfan and use of a perimeter trap crop. The primary disease problems were bacterial wilt and powdery mildew. The trial was sprayed with Flint to prevent infection with plectosporium. A week of very hot, humid weather at the end of August led to severe sunburn of the fruit, particularly on the acorn squash varieties which had lost much of their leaf cover to powdery mildew. No yield data was collected on the winter squash trial as the squash was harvested over a period of 2 months by student groups.

Recommendations: The acorn varieties were the worst affected by sunburn in late August – the foliage had mostly died back and the dark green rind absorbed a lot of heat. 'Table Treat' had the least powdery mildew, but all varieties matured fruit before the mildew became severe. 'Sweet REBA' was noteworthy for its highly compact plants. We were very impressed with the ornamental appearance and flavor of 'Honey Nut'. The fruits start out with dramatic orange and green stripes and mature to a yellow-brown during curing. The flesh is oranger and sweeter than other butternuts. The rind is unusually thick for a butternut, but this provides useful protection from fruit infection with phytophthora (buckeye rot). 'Honey Nut' developed severe powdery mildew in our trial, although it is supposed to have a high level of field resistance. However, powdery mildew did not appear to affect the quality of the fruit. 'Honey Nut' produces many small, single-serviing fruit and does not appear to yield as well as some other varieties. The variety JWS 6823 had the best disease resistance of any of the butternuts, and excellent performance. Other butternut varieties of note were Bugle and Metro, both of which showed good powdery mildew resistance and were only minimally affected by bacterial wilt. The kabocha varieties suffered greatly from bacterial wilt; 'Space Station' and 'Thunder' had the least wilt and best yield.

Variety	Source	Type	Bacterial Wilt	Powdery Mildew	Notes
Table Star	Rupp	acorn	none	severe	early, good yield but severe sunburn
Table Treat	Rupp	acorn	none	mild	sunburn
Tip-top	Johnny's	acorn	mild	severe	early, severe sunburn, supposedly mildew resistant
Sweet REBA	High Mowing	acorn	mild	severe	compact plants, mature
Honey Bear	Johnny's	acorn	mild	severe	vines dead 8/26
Honey Nut	High Mowing	butternut	mild	severe	striped fruit, low vigor, late, excellent flavor, hard rind, OP
Bugle	Rupp	butternut	mild	mild	good yield, earlier than Metro
Metro	Johnny's	butternut	none	mild	some mature fruit 8/26
Betternut 401	Rupp	butternut	mild	severe	early, good yield, vines dead by 8/26
JWS 6823	Johnny's	butternut	none	none	healthy, vigorous vines
Sweet Lightning	Rupp	delicata	mild	moderate	early, ornamental, powdery mildew tolerant
Sugar Dumpling	High Mowing	delicata	moderate	severe	small plants, low yield
Thunder	Rupp	green kabocha	moderate	mild	less wilt than other maximas
Cha-cha	Johnny's	green kabocha	severe	n/a	
Space Station	Rupp	green kabocha	mild	mild	good yield
Confection		grey kabocha	moderate	moderate	poor yield
Sunshine	Johnny's	scarlet kabocha	severe	n/a	moderate yield, pretty fruit
Blue Ballet	Johnny's	Hubbard	severe	n/a	essentially eliminated by wilt
La Estrella	Rupp	pumpkin	none	moderate	late, continued growing until frost
Musque de Provence		pumpkin	none	mild	very large plants, late maturing fruit
Bliss		pumpkin	mild	moderate	mildew mostly on older leaves, white coating on fruit
Marina di Chioggia	Johnny's	pumpkin	mild	mild	yielded well for heirloom
Small Wonder		spaghetti	none	severe	good yield, vines dead by 8/26
Valenciano		white pumpkin	severe	n/a	essentially eliminated by wilt

Table 1. Disease and performance notes for winter squash trial.

Onions

We evaluated 15 long-day storage onion varieties for performance and yield. Each variety was started both as transplants and by direct seeding. All of the direct-seeded plots failed, but we had no trouble with germination in the greenhouse. This suggests that the failure of the direct seeded plots was due to the field environment rather than to seed quality. Transplants were started in plug trays in the greenhouse in late March and transplanted to the field on May 3rd. Root development on most varieties was insufficient to create actual 'plugs', making it difficult to remove the transplants from the flats. We seeded 72 plugs per variety but germination was mixed. Spacing was 15 inches between rows and 4 inches between plants. Fertilizer was banded prior to planting using a side-dress unit. Irrigation was applied as needed using sprinklers. Weeds were controlled by hand. No insect problems were observed, and the only disease problem was bulb rot in some varieties.

Growth characteristics were noted on June 1, June 30, and July 26. Onions were harvested in mid-August; weights were taken on September 1 after bulbs had cured. 'Western Giant', 'Vespucci' and 'Cortland' were stunted and chlorotic by June 30, possibly because no fertilizer was applied to the row they were planted into. The plants were side-dressed with 10-10-10 and fertigated with ammonium sulfate, but did not completely recover. The varieties 'Nicolet', 'Mustang', 'Milestone' and 'Pulsar' were the most vigorous on June 1, and continued to perform well throughout the season. 'Copra', 'Olympic', 'Patterson', and 'Infinity' started off poorly but were strong and robust by June 30. 'Red Wing' had exceptional performance. Many of the varieties lacked uniformity in bulb shape and size despite the uniform spacing of the transplants. The varieties with the best uniformity were 'Pulsar', 'Olympic', and 'Red Wing'. Bulb rot was particularly problematic with 'Mustang', 'Mercury', and 'Infinity' although all varieties had some rotten bulbs.

Based on this trial we would strongly recommend that growers in RI start onions from locally-produced transplants rather than direct seeding unless soil high in organic matter is available. Recommended varieties include 'Pulsar', 'Copra', 'Red Wing' and 'Patterson'. 'Olympic' would be a good variety for an earlier harvest. 'Mustang', 'Mercury', 'Spanish Medallion' and 'Infinity' are not recommended due to low yields and/o a high percentage of rotten bulbs.

Variety	Source	Transplant Establishment	6/30 Notes	7/26 Notes
Nicolet	Sieger	strong	robust	robust, good bulbs
Mustang	High Mowing	strong	robust, appear crowded	robust, good bulbs
Pulsar	Sieger	strong	strong to weak along plot	uniform crop
Mercury	Sieger	stunted	struggling crop	irregular sizes
Milestone	Sieger	strong	irregular growth, crowded	irregular growth, good-sized bulbs
Bridger	Johnny's	weak	irregular growth	foliage down, early? good-sized bulbs. Crop appears poor
Copra	Johnny's	weak	robust, uniform	robust, uniform
Olympic	Johnny's	weak	robust, uniform	foliage down. Good bulb formation, weedy plot
Red Wing	High Mowing	n/a	exceptional	robust, uniform crop
Patterson	Johnny's	uneven	exceptional	robust, uniform crop
Spanish Medallion	Rupp	poor	poor, some dead	poor, most dead
Infinity	Sieger	moderate	robust, uniform	robust, uniform crop
Western Giant	Rupp	weak	poor, stunted, yellowing	poor recovery, irregular bulb formation
Vespucci	Rupp	weak	poor, stunted, yellowing	no response to fertilizer
Cortland	Johnny's	stunted	poor, stunted, yellowing	poor recovery

Table 1. Onion trial growth characteristics

Variety	Color	Yield (lbs)	No. of bulbs	% marketable	Bulb Notes
Nicolet	yellow	14	37	81	lacks uniformity
Mustang F1	yellow	15	43	58	
Pulsar F1	yellow	18	68	98	
Mercury	red	7.5	42	43	lack uniformity but nice shine
Milestone	yellow	15	46	98	lack uniformity
Bridger F1	yellow	10	40	87	oblong bulbs, lack uniformity
Copra F1	yellow	16	60	90	lack uniformity
Olympic F1	yellow	16	61	93	flat top
Red Wing F1	red	29	46	98	uniform
Patterson	yellow	21.5	46	87	lack uniformity
Spanish Medallion	yellow	3	7	86	lack uniformity
Infinity	yellow	21.5	64	62	lack uniformity
Western Giant F1	yellow	7	31	90	small bulbs
Vespucci	yellow	< 1	4	0	cherry-tomato sized bulbs.
Cortland F1	yellow	1	20	0	cherry-tomato sized bulbs

Table 2. Onion trial yield and bulb characteristics