

file copy

1972

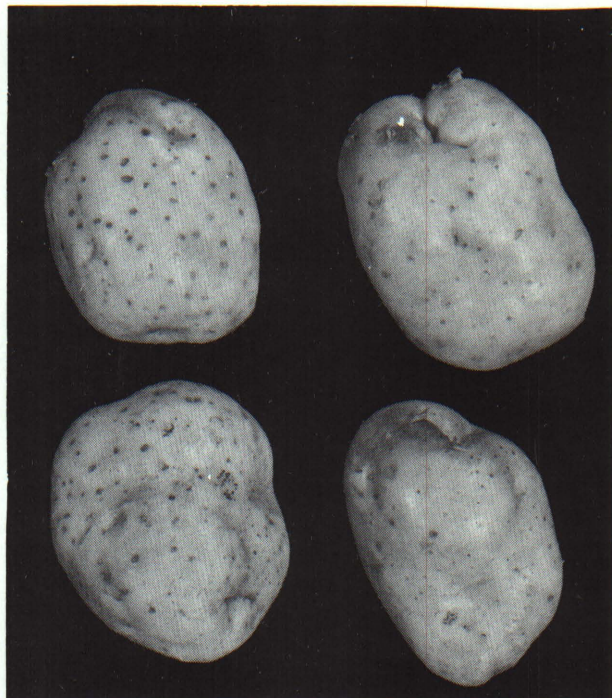
OHIO POTATO CULTIVAR TRIALS

OHIO AGRICULTURAL R & D CENTER

FEB 6 '73

LIBRARY

A. R. MOSLEY, E. C. WITTMAYER, F. I. LOWER, and R. E. PARTYKA



DEPARTMENT OF HORTICULTURE

Ohio Agricultural Research and Development Center

Wooster, Ohio

Horticulture Series No. 390

January 1973

This page intentionally blank.

OHIO POTATO CULTIVAR EVALUATION -- 1972

A. R. Mosley, E. C. Wittmeyer¹, F. I. Lower² and R. E. Partyka³

INTRODUCTION

Historically, potato cultivar evaluation has been an important segment of potato research in Ohio. The testing format used presently was adopted in 1963. Essentially, 10 to 15 promising cultivars are evaluated at several locations annually in order to ascertain their performance under a wide range of conditions. In addition, a larger number of observational selections are tested less extensively at 1 or 2 locations. Promising cultivars are transferred from the observational plots to the major study as needed. Cooperating grower farms and the Muck Crops Branch at Celeryville are used as testing sites.

The 1972 Evaluation Program included 3 phases: (1) a main test of 8 cultivars on mineral soils at 5 locations and 26 observational selections at 2 locations, (2) a trial of these 8 major cultivars on muck soils at Celeryville, and (3) an early planting of 10 cultivars on gravelly loam at Marietta to determine their suitability for late summer cropping.

MAIN TEST

Eight cultivars were evaluated in replicated trials on farms of 5 cooperating growers in 1972 (see map, last page). Entries by season of maturity were:

| Early | Midseason to Late | |
|----------|-------------------|----------|
| Superior | Abnaki | Kennebec |
| Haig | Shurchip | Katahdin |
| | Norchip | NY 41 |

These represented a wide range of characteristics, Table 1. Superior was included as a standard for the early cultivar Haig while Katahdin served a similar function for midseason to late types. Kennebec was included as a chip quality standard. In addition to these 8 entries in the replicated tests, 26 observational selections were evaluated at 2 locations, Tables 2 and 3.

Methods

Planting and Cultural Considerations.--Cut or whole B-size seed were planted by 2-row pick-type planters. Seed pieces were treated by dusting with Polyram. Seed of named cultivars were obtained from commercial sources; seedlings and numbered selections were supplied by the originating state and USDA breeding programs.

¹Extension Horticulturist, ²County Agent, Imeritus, ³Extension Plant Pathologist.

Table 1. Origin, Year Released, Recognized Disease Resistance, Season of Maturity and Principal Characteristics of Cultivars. Ohio Potato Cultivar Trials--1972.

| Cultivar | Origin | Year* Released | Resistant to: | Characteristics |
|----------|--------------------|-------------------|--|---|
| Haig | Nebr. | 1957 | Scab, Virus X | Late strain of Haig. Claimed to set lighter. |
| Superior | Wisc. | 1961 | Scab, Late Blight | Kennebec x Merrimack. Standard Early Variety in Ohio. |
| Abnaki | USDA Me. & N.Y. | 1971 | Vert. Wilt, Leaf Roll Mild Mosaic | High yields. Susc. to Late Blight. |
| Shurchip | Nebr. | 1968 | Scab. Tolerant to Vert., Fus. Wilts | Attractive, high yields. Susc. to Late Blight. |
| Norchip | N.D. | 1968 | Scab, Some Insects | Attractive. Sets rather heavily. |
| Kennebec | USDA | 1948 | Late Blight, Net Necrosis, Mosaics | Very Susc. to Vert. Wilt and Spindle tuber. High yields, low grades. Chips, cooks well. |
| Katahdin | USDA | 1935 | Leaf Roll, Mosaic Yellow Dwarf | Widely adapted standard variety in Ohio. Same parentage as Chippewa. |
| NY 41 | N.Y. | 1973? | Golden Nematode | High yields of large tubers. To be released as "Hudson: in 1973. |

* Times included in trials, see Table 7.

Table 2. Origin, Year Released, Recognized Disease Resistance, and Characteristics of Observational Cultivars. Ohio Potato Trials--1972.

| Cultivar | Origin | Year Released | Disease Resistance | Years In Ohio Tests | Characteristics |
|------------------------|-------------------|---------------|---------------------------------------|---------------------|---|
| Seminole | USDA Frito-Lay | 1969 | Mild Mosaic Vert. Wilt (Mod.) | 4 | Adapted to the South. |
| Onaway | USDA & Mich. | 1957 | Scab, L. Blight (Mod.) | - | Susc. to Vert. Wilt. |
| Chippewa | USDA | 1933 | Mild Mosaic | - | Very Susc. to Leaf Roll. |
| MS 709 | Mich. | 1973? | - | 4 | High yields of attractive tubers. |
| Iopride (Iowa 6413) | Iowa | 1970 | Scab, Virus X, L. Blight (Mod.) | 4 | Smooth, uniform, good yields. |
| Raritan | Can. & N.Y. | 1970 | Virus X & A, Vert. Wilt, (Mod.) | 2 | Large tubers. Hollowheart in 1971. |
| Peconic | N.Y. | 1966 | Golden Nematode | 5 | Sets heavily. Drought Susc. Good Yields. |
| Cascade M (48-1) | USDA & Wash. | 1969 | Leaf Roll, Vert. Wilt, Scab, Rhiz. | 4 | Good yields. Does not chip. Good french fries. Mut. of Cascade. |
| York | Can. | 1969 | Late Blight | 4 | Very early. |
| Jewel | N.Y.- Pratt | 1964 | None Known | | Attractive |
| Penn 71 | Pa. | 1972 | Late Blight Tol. Speckle Leaf? | | High S. G. Kennebec X Penn Chip. |

Table 3. Years Tested in Ohio and Origin of
Observational Seedlings. Ohio Potato Trials--1972.

| Seedling | Origin | Years In Ohio Tests | Seedling | Origin | Years In Ohio Tests |
|------------|--------|------------------------|------------|--------|------------------------|
| 6 RF1 | Pa. | 1 | BR 6448-7 | USDA | 2 |
| C 6 x 6 | Pa. | 1 | BR 6316-7 | USDA | 2 |
| 9355-16 | Nebr. | 5 | B 6951-1 | USDA | 1 |
| 91.57-H 18 | Nebr. | 4 | B 6987-18 | USDA | 1 |
| 1.57-1 | Nebr. | 2 | B 6987-37 | USDA | 1 |
| 49-62-5 | Nebr. | 1 | FL. 73 | Wisc. | 1 |
| ND 7642-3 | N.D. | 1 | FL. 2 | Wisc. | 3 |
| ND 7103-4 | N.D. | 1 | | | |
| B 6692-5 | USDA | 2 | ND 7196-18 | N.D. | 2 |

Spacing varied with location but averaged 10 x 34 inches. Individual growers used their customary cultural and spray programs, Table 4. Plots consisted of double 40- foot rows of 50 seed pieces each in the main test and double 20- foot rows of 25 seed pieces each for the observational study. Plots were replicated 3 times at all locations to facilitate statistical analyses.

Weather Conditions.--In general, moisture during the growing season was double the usual amount at most locations, Table 5. However, during late July and early August precipitation was deficient at 3 locations. Farms 2 and 3 were irrigated during this period. Late September, October, and November were extremely wet to the point of delaying harvest operations on most farms and resulting in the complete loss of plantings 6 and 7.

Harvest and Evaluation.--Stand, vigor, and disease were evaluated during the growing season. Tubers were dug with a flat-bed digger, picked up by hand, and weighed. A 50-lb. sample was then collected from each plot for subsequent grading into size and quality categories. Samples of marketable tubers were collected for tests of stem-end discoloration, specific gravity, chippability and storageability.

Observational selections were located on Farms No. 4 and 5. During the season, entries were subjectively evaluated for disease and appearance in the field. Yield and tuber size and defects were recorded as in the main plots. However, only high-yielding entries were sampled for chip, specific gravity and storage tests.

Results

Yield.--The term "Marketable Yield" is essentially synonymous with U.S. No. 1 grade, i.e., A-size tubers fairly free of external defects.

NY 41 produced highest total and marketable yields with 395 and 352 cwt. per acre, respectively, Table 6. Shurchip yielded 304 cwt. of marketable tubers, followed by Abnaki, 297; Haig, 295; Kennebec, 284; Norchip, 283; Katahdin, 277; and Superior with 227 cwt. per acre.

The relative ranks, by marketable yield, of cultivars grown in both 1971 and 1972 were identical for the two years, Table 7. In both instances NY 41 led, Shurchip ranked second, Abnaki, third and so on. In 1972 yields of marketable tubers ranged from 352 cwt. per acre for NY 41 to 227 for Superior; in 1971 these cultivars differed in yield by only 70 cwt. A comparison between NY 41 and Superior may be slightly misleading, however, since Superior is an early cultivar and would tend to produce lower yields than a midseason or late type such as NY 41. The early maturing Haig, also outyielded Superior by approximately 70 cwt. per acre.

Neither 1971 nor 1972 were high-yielding years for Katahdin. During 10 years of testing Katahdin has produced an average yield of 300 cwt. per acre, Table 6. Yet, it produced only lighth highest yields of 13 cultivars in 1971 and seventh, of 8 cultivars in 1972. The data indicates newer cultivars have considerably more yielding potential than does Katahdin. Nevertheless, Katahdin has been a dependable standard cultivar and will doubtless continue to play a major role in potato production in Ohio despite occasional low yields.

Table 4. Details of Cultural Practices by Farm
Ohio Potato Trials--1972.

| Factor | Location | | | | |
|---------------------------|-------------------------------|---|----------------------|-------------------|-----------------------|
| | 1 | 2 | 3 | 4 | 5 |
| Planting Date | May 2 | May 5 | May 6 | May 12 | May 29 |
| Harvest Date | Sept. 22 | Oct. 7 | Oct. 4 | Sept. 27 | Oct. 10 |
| Date Killed | Sept. 9 | Sept. 15 | NO | Sept. 16 | Sept. 25 |
| Crop in 1971 | Sweetcorn | Potatoes | Potatoes | Potatoes | Potatoes |
| Crop Plowed Down | Rye | Brome | None | Rye | Rye |
| Fertilizer per Acre | 100 Lbs. ¹ urea | 400 Lbs. 19-19-19 ² 550 Lbs. 19-19-19 | 1400 Lbs. 9-18-18 | 50 Lbs. N. on Rye | 1000 Lbs. 10-20-20 |
| Herbicide per Acre | Eptam, 30 Lb. | Lorox, 2 Lb. | Lorox, 3 Lb. | Eptam, 50 Lb. | Eptam 50 Lb. |
| Systemic Insect. Per Acre | Thimet, 25 Lb. Gran. | Disyston 15% | Disyston, 20 Lb. 15% | Disyston, 25 Lb. | Disyston, 30 Lb. |
| Spacing, Inches | 9.5 x 34 | 10 x 34 | 9.5 x 34 | 8.5 x 36 | 11 x 34 |
| Soil Type | Sandy Loam | Wooster Silt Loam | Oakley Silt Loam | Silt Loam | Wooster Silt Loam |

¹ Plowed down; ² In-row at planting.

Table 5. Inches of Moisture Received During the Growing Season by Farm.
Ohio Potato Trials--1972.

| Month | Farm Number | | | | |
|--------------------|-----------------|-------------------|------------|--------------------|-------|
| | 1 | 2 | 3 | 4 | 5 |
| May 1-15 | -- ¹ | 1.50 | 4.30 | ---- | ---- |
| 16-31 | -- | 1.75 | 1.40 | 0.00 | 0.00 |
| June 1-15 | -- | 2.08 | 2.50 | 3.80 | 1.30 |
| 16-30 | -- | 1.75 | 0.45 | 2.25 | 2.25 |
| July 1-15 | -- | 2.74 | 2.40 | 2.55 | 2.88 |
| 16-31 | -- | 0.75 | 1.60 | 1.10 | 0.30 |
| August 1-15 | -- | 0.00 | 1.80 | 0.85 | 0.28 |
| 16-31 | -- | 0.75 | 3.70 | 2.10 | 1.47 |
| September 1-15 | -- | 2.00 | 2.70 | 0.45 | 1.04 |
| 16-30 | -- | 7.00 | 3.70 | 3.50 | 4.40 |
| October 1-15 | -- | 2.50 | ---- | ---- | 0.10 |
| Irrigation, inches | -- | ---- | 1.00, 7/26 | 1.30 | ---- |
| | | | 1.00, 8/2 | 6/28 | ---- |
| Total Moisture | | | | | |
| Plant-Kill | 15.19 | 21.0 ¹ | ---- | 13.10 ² | 11.92 |
| Plant-Harvest | 17.50 | 24.12 | 25.85 | 16.60 | 13.02 |
| Average Marketable | | | | | |
| Yield cwt/Acre | 356.4 | 189.6 | 268.7 | 275.6 | 258.6 |

¹ Data unavailable. ² Record began May 20.

Table 6. Average Yield, Percent of Perfect Stand and Major Defects
of Cultivars.¹ Ohio Potato Trials--1972.

| Cultivar | Yield, CWT/A | | Yield, Percent | | | Percent Stand | Major ³ Defects |
|--------------------|------------------|-------|----------------|--------|-------|------------------|-------------------------------|
| | Mkt ² | Total | Mkt. | B-Size | Culls | | |
| NY 41 ⁴ | 352.1 | 395.2 | 89.1 | 3.66 | 7.30 | 82.3 | Gr, Sh |
| Shurchip | 304.6 | 340.7 | 89.4 | 5.08 | 5.63 | 87.2 | Gr, Sh, Gc |
| Abnaki | 297.3 | 322.8 | 92.1 | 2.73 | 5.13 | 79.5 | Sh, Gr |
| Haig | 295.6 | 334.1 | 88.2 | 6.19 | 5.62 | 88.2 | Gr, Sh, Sc |
| Kennebec | 284.9 | 353.5 | 80.6 | 3.42 | 16.02 | 85.1 | Sh, Gr, Gc |
| Norchip | 283.7 | 336.5 | 84.3 | 5.70 | 9.96 | 85.4 | Sh, Gr, Gc |
| Katahdin | 277.3 | 315.8 | 87.8 | 5.15 | 7.06 | 81.9 | Gr, Sh |
| Superior | 227.8 | 257.4 | 88.5 | 5.05 | 6.51 | 82.7 | Sh, Gr, Gc |
| LSD .05 | 27.1 | 32.9 | 2.20 | 1.02 | 1.97 | 6.28 | |
| .01 | 36.0 | 43.7 | 2.92 | 1.36 | 2.62 | 8.33 | |

¹ Entries ranked top to bottom according to marketable yield.

² Mkt = marketable tubers; essentially US No. 1.

³ Ranked left to right in decreasing order according to severity:

Gr = sungreen; Sh = Shape; Sc = Scab; Gc = Growth Cracks.

⁴ Three locations only.

⁵ LSD = Least Statistically Significant Difference.

Table 7. Average Yields of Marketable Potatoes for Cultivars Grown in 1972 and For Those Grown More Than Two Years in Ten Years of Testing. Ohio Potato Cultivar Trials--1972.

| Variety | Years Tested | | | | | | | | | | Avg. Yield, Cwt./Acre |
|---------------------|--------------|------|------|------|------|------|------|------|------|------|--------------------------|
| | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | |
| <u>Early</u> | - | - | - | 204 | 254 | 233 | - | - | 310 | 296 | 259 |
| Cobbler | 213 | 244 | 251 | - | - | - | - | - | - | - | 236 |
| Alamo | - | - | - | - | - | 298 | 286 | 308 | 277 | - | 292 |
| Superior | 213 | 261 | 289 | 255 | 283 | 269 | 308 | 269 | 275 | 228 | 265 |
| Iopride | - | - | - | - | - | - | - | 321 | 302 | - | 312 |
| <u>Medium Early</u> | | | | | | | | | | | |
| Snowflake | 246 | 276 | 285 | 195 | - | - | - | - | - | - | 250 |
| Norgold Russet | - | 263 | 259 | 221 | - | - | - | - | - | - | 248 |
| LaChipper | 252 | 316 | 326 | 282 | 325 | 272 | 301 | - | - | - | 296 |
| Platte | - | - | - | - | 315 | 273 | 302 | - | - | - | 296 |
| Monona | - | - | - | 229 | 288 | 231 | 284 | 274 | 300 | - | 276 |
| Wauseon | - | - | - | - | - | - | - | 297 | 270 | - | 284 |
| Abnaki | - | - | - | - | - | - | - | - | 319 | 297 | 308 |
| <u>Midseason</u> | | | | | | | | | | | |
| Peconic | - | - | - | - | - | 305 | 297 | 349 | 290 | - | 310 |
| Arenac | 261 | 257 | 332 | 202 | - | - | - | - | - | - | 265 |
| Penobscott | - | - | - | 222 | - | 307 | 425 | - | - | - | 318 |
| Shurchip | - | - | - | - | - | - | 385 | 282 | 335 | 304 | 352 |
| Norchip | - | - | - | - | - | 307 | 282 | 355 | 294 | 284 | 304 |
| MS 503 | - | - | - | - | - | - | - | - | 276 | - | 276 |
| NY 41 | - | - | - | - | - | - | - | - | 347 | 352 | 350 |
| Katahdin | 297 | 218 | 405 | 270 | 327 | 284 | 290 | 344 | 285 | 277 | 302 |
| Kennebec | 273 | 253 | 394 | 290 | 286 | - | - | - | - | 285 | 314 |
| Lenape | - | - | - | - | 326 | 263 | 274 | - | - | - | 321 |
| <u>Late</u> | | | | | | | | | | | |
| Sebaço | 242 | 268 | 374 | 225 | 299 | - | - | - | - | - | 282 |
| Ona | 279 | 247 | 402 | 234 | 350 | 319 | - | - | - | - | 305 |

The percentage of B-size tubers ranged from 2.73 for Abnaki to 6.19 for Haig, Table 6. Norchip which ordinarily tends to produce a high percentage of small tubers, yielded 5.70 percent B's. Other cultivars producing more than 5% B-size tubers were Shurchip, 5.08; Katahdin, 5.15; and Superior, 5.05 percent.

Abnaki also produced the smallest percentage of culls with 5.13 percent, Table 6. However, percent culls in this instance was based only on external appearance and did not reflect a tendency toward hollow heart normally associated with large-sized tubers. Hollow heart was fairly common in Abnaki at some locations in 1972.

Kennebec produced a very high 16 percent cull tubers. Culls were accounted for largely by off-shapes and, to a lesser extent, greening. Kennebec also showed a tendency toward rots in 1972. Severely rotted tubers were not picked up at harvest and were not reflected in the data.

Observational Selections.--Several observational selections produced very high yields in 1972. BR 6316-7, a Beltsville seedling yielded 427 cwt. per acre, Table 8. Unfortunately this seedling is too late for Ohio conditions. Other high yielding selections, to be tested further in 1973, include Onaway, 416 cwt; 6RF1, 412; Peconic, 380; C6X6, 371; B 6692-5, 365; BR 6448-7, 364; MS 709, 361; and Penn 71 with 357 cwt. per acre. The remaining selections listed in Table 7 will be either tested in 1973 (+), dropped (-), or reconsidered for possible use in 1973 (?) as indicated.

Percent Stand.--1972 was an unusually bad year for Rhizoctonia stem rot due to wet, cold weather during spring and early summer. A severe frost on June 11 in several areas of the state compounded the problem. As a result, stands were somewhat low in 1972. Values ranged from a high of 88.2 for Haig to a low of 79.5 for Abnaki, Table 6. The average stand for all cultivars in 1972 was 83 percent; in 1971, the average stand was 85 percent.

The percent of perfect stand and marketable yield did not appear to be closely related in 1972. For example, Abnaki which produced the lowest average percent stand at 79.5 produced third highest marketable yields with 297 cwt. per acre; likewise, Haig which produced the highest stands was fourth in yield.

Disease and Tuber Disorders.--Plant vigor and the incidence of disease were subjectively evaluated at weekly intervals on Farms No. 4 and 5. Norchip showed a considerable amount of mild mosaic on Farm No. 5 but only occasional plants were infected with mosaic or leaf roll in other instances. Fusarium and/or Verticillium wilt and other diseases were not evident. Vigor appeared to be good to very good with the exception of one replicate of Abnaki and Shurchip on Farm No. 4 and two replicates of Abnaki and Katahdin on Farm No. 5. Vigor of Superior and Katahdin was only poor to fair on Farm No. 2.

Table 8. Yield, Percent Marketable Tubers, Percent of Perfect Stand, and Maturity of Observational Selections. Ohio Potato Trials--1972.

| Selection | Use in ¹ 1973 | Mkt. Yield Cwt/Acre | Percent Mkt. | Percent Stand | Season of Mat. | Comments |
|------------|-----------------------------|------------------------|-----------------|------------------|-------------------|---|
| BR 6316-7 | - | 427.4 | 93.6 | 94.5 | Late | Lge. tubers, attractive. Exc. buff skin. High yields. <u>Too Late</u> . |
| Cascade M | ? | 424.2 | 82.6 | 77.5 | Late | Good french fries, poor chips. Lge, rough. Enl. lenticels. Some scab. |
| Chippewa* | ? | 418.3 | 92.4 | 89.0 | Midseason | Attractive. Med. size. Known variety. |
| Onaway* | + | 416.1 | 97.5 | 100.0 | Midseason | Attractive. Med. size. Nice skin. Enl. lenticels. |
| 6 RF1 | + | 412.5 | 93.1 | 89.0 | Midseason | Med.-Lge. High yields, promising. |
| ND 7196-18 | ? | 392.0 | 89.7 | 80.0 | Midseason | High yields. Chips. M.H. and flecking. |
| Peconic | + | 380.1 | 89.6 | 95.0 | Midseason | Attractive. Good yields. Smooth. Creamy white. Some Enl. lenticels. |
| C 6x6 | + | 371.0 | 89.7 | 95.5 | Midseason | Droughth Susc. Good yields. Sl. russet. Tubers sometimes small. |
| B 6692-5 | + | 365.2 | 95.2 | 88.5 | Very Early | Good yields, grades. Att. white. Med. size, shallow eyes. |
| BR 6448-7 | + | 364.4 | 87.4 | 37.0 | Very Early | Good yields. Eyes deep. |
| MS 709 | + | 361.1 | 92.8 | 77.9 | Midseason | Yields above average. Med.-Large. Nice. Similar to Katahdin. Slight scab. |

cont./.....

| Selection | Use in ¹ 1973 | Mkt. Yield Cwt/Acre | Percent Mkt. | Percent Stand | Season of Mat. | Comments |
|-----------|-----------------------------|------------------------|-----------------|------------------|-------------------|---|
| Penn 71 | + | 357.3 | 90.8 | 89.0 | Midseason | High solids, yields above Kat. smooth white. Slightly lge. Smooth lent. Kenn-ebec x Pennchip. |
| FL 73 | ? | 349.7 | 91.3 | 85.0 | Late | Yields above avg. Attractive. Shallow eyes |
| B 6987-37 | ? | 348.6 | 95.6 | 85.0 | Late | Pale yell. flesh. Attractive. Shallow eyes Internal discoloration. |
| B 6987-18 | ? | 319.0 | 90.2 | 82.0 | Midseason | Slight russ. Good shape. Some tubers large |
| B 6951-1 | ? | 317.5 | 88.0 | 86.5 | Midseason | Slight russet. Netted. Small-medium size. |
| Seminole | ? | 313.4 | 83.7 | 94.0 | Early | High solids, yields. Chips. Red tinge in eyes. Some Enl. lenticels. |
| Raritan | + | 312.7 | 89.8 | 86.7 | Late | Fair-good chipper. Sl. russ., some netting Med.-Lge. tubers. |
| 91.57-H18 | ? | 302.6 | 93.0 | 90.5 | Midseason | Good chipper. Light russ. Av. yields. Small, netted. Scab, rhizoc. Haig cross. |
| ND 7103-4 | ? | 284.8 | 88.5 | 73.5 | Early | Attractive. Chips. Med.-small. Low yields. Scab, Enl. lenticels. Brown-yellow skin. |
| Jewell | ? | 271.7 | 90.5 | 88.5 | Midseason | High solids. Chips. Gd. yields. Med. size. Nice, Enl. lenticels. |
| 49-62-5 | ? | 269.1 | 92.9 | 94.5 | Very Early | Low yield of small tubers. Int. discolor. Nice red. Eyes on bud end too deep. |
| York | + | 239.5 | 92.4 | 88.0 | Very Early | High solids. Att. light russ. Med. size. cont./..... |

....Page 3

| Selection | Use in ¹ 1973 | Mkt. Yield Cwt/Acre | Percent Mkt. | Percent Stand | Season of Mat. | Comments |
|-----------|-----------------------------|------------------------|-----------------|------------------|-------------------|--|
| 93.55-16 | ? | 227.3 | 87.0 | 87.5 | Early | Chips well. Low yields. Light russ. Haig cross. |
| FL 2 | - | 226.4 | 84.9 | 74.5 | Early | Good chips. Low yields and grades. Slight russ. Internal flecking. |
| 1-57-1 | - | 214.8 | 88.5 | 97.5 | Very Early | Very low yields. Russ. Too small. |

* Tritten Farm Only

¹+ Selections to be tested in 1973

- Will not be tested in 1973

? Uncertain for testing in 1973.

Greening and off-shapes were the major tuber disorders observed, Table 6. Greening was especially pronounced in Katahdin, NY 41, Shurchip and Haig; off-shapes were most serious in Kennebec, Norchip, Abnaki, and Superior. Some scab was noted in Haig while growth cracks were common but not serious in Shurchip, Kennebec, Katahdin and Superior. Due to the extremely wet fall, lentical enlargement was evident in tubers of most cultivars giving them a rough-skinned appearance. Norchip and Kennebec were least susceptible to this disorder while NY 41 appeared to be very susceptible.

Stem-end Discoloration.--Composite samples of 21 tubers each per cultivar were collected from each location for evaluation of stem-end or vascular discoloration. Tuber tissues were cultured in the laboratory to determine whether Fusarium or Verticillium wilt were associated with the discolored areas. Averaged values for all farms showed Haig and NY 41 to have the lowest percentage of vascular discoloration while Shurchip and Katahdin were highest, Table 9.

Table 9. Average Percent of Tubers Showing Vascular Discoloration.

| Rank, Low to High | | | |
|-------------------|------|----------|------|
| Haig | 14.3 | Superior | 24.8 |
| NY 41 | 14.3 | Kennebec | 25.7 |
| Norchip | 22.9 | Katahdin | 28.6 |
| Abnaki | 23.8 | Shurchip | 33.3 |

Superior showed more Verticillium wilt than did other cultivars. Verticillium was more prevalent in tubers than Fusarium and may have reflected lower soil temperatures to some extent. It is interesting to note that 4 cultivars, Haig, Abnaki, Superior, and Shurchip did not show any discoloration when grown at Marietta for very early harvest, Table 14.

Observational Selections.--Symptoms of leaf roll and mosaic were noted in several observational plots on both farms. At least 4 percent of the plants of Peconic, Jewel, Penn 71, FL2, and B 6951 showed symptoms of leaf roll at either or both locations; Mosaic was evident in at least 4 percent of the plants of Penn 71, 6RF1, ND 7103-4 and MS 709.

A small amount of bacterial stem rot was found in several lots, but 17% of the B 6692-5 plants were infected in both replicates on Farm No. 5. Not more than one percent wilt was observed in any plots. Vigor was poor to fair in FL2 on both farms, and only fair in one replicate on one farm each for 93.55-16, Penn 17, 6RF1, FL 73, and Cascade. A small amount of surface scab was present in FL 73, Raritan, BR 6316-7, MS 709 and B 6951.

CELERYVILLE TRIALS--1972

Eight potato cultivars were tested at the Muck Crops Branch, Celeryville in 1972. These were, by season of maturity:

| Early | Midseason to Late | |
|----------|-------------------|----------|
| Superior | Abnaki | Kennebec |
| Haig | Shurchip | Katahdin |
| | Norchip | NY 41 |

These represented a wide range of characteristics, Table 1. For purposes of comparison, Superior was included as a check for the early cultivar Haig and Katahdin, for the midseason to late cultivars.

Factors studied were yield, size distribution, tuber disorders, chippability and storageability. Results of chip and storage tests will be reported later.

Methods

Prior to planting, 900 lbs./acre of 0-25-25 was broadcast and worked in. Planting was achieved by hand-feeding either cut seed pieces or whole B-size tubers into a cup-type planter. All seed was obtained from commercial outlets with the exception of NY 41 which was donated by Cornell University. Seeds were spaced 11 inches apart in 32-inch rows. Plots consisted of single rows 23 feet long and were replicated 5 times.

Thimet was banded at the rate of 30 lbs./acre of 10% granules at planting; Phosdrin at 1/4 lb./acre and Thiodan at 1/2 lb./acre were alternated on a weekly basis for late season insect control. The fungicide Dithane M-45 at 3 lbs./acre was applied at weekly intervals after plants were 6-8 inches tall. Weed control practices consisted of mechanical cultivation and post-emergence application of Eptam at 4 lbs./acre when the plants were about 12 inches tall.

Tubers were dug mechanically and picked up by hand on October 2 after a growing season of 144 days. Vines were essentially 90-100 percent dead of natural causes at harvest. Tubers were weighed in the field for total yield, stored overnight and graded into size and quality categories the following day. Samples of "marketable" tubers were taken to Columbus for chip and storage tests.

Yield and Tuber Defects.--NY 41 produced highest total and marketable yields with 378 and 312 cwt/acre, respectively, Table 10. Shurchip yielded second with 308 cwt. and Abnaki was third with 301 cwt. per acre. Results on a relative basis are very similar to those obtained on mineral soils, Table 6. Other yields were Kennebec, 295; Haig, 289; Katahdin, 269; and Norchip, 283 cwt. per acre. Superior again fell considerably below all other cultivars with 166 cwt. per acre.

Table 10. Yield in Cwt/Acre and Size Distribution of Tubers. Muck Crops Potato Trials--1972.

| Cultivar ² | Yield, Cwt/A. ³ | | Yield, Percent | | | Comments |
|-----------------------|----------------------------|-------------------|----------------|--------|-------|--|
| | Total | Mkt. ³ | Mkt. | B-Size | Culls | |
| NY 41 ² | 378.4 | 312.1 | 82.7 | 8.3 | 9.7 | Large lenticel. Rough shape, skin Large Tubers. |
| Shurchip | 353.1 | 308.9 | 86.4 | 10.6 | 2.70 | Good shape, size. Dark skinned. |
| Abnaki | 356.0 | 301.7 | 78.0 | 9.5 | 7.8 | Nice. Very light skin. No scab. Some greening. |
| Kennebec | 353.7 | 295.7 | 82.8 | 7.0 | 9.6 | Greens, off-shapes. Large. |
| Haig | 324.9 | 289.5 | 89.3 | 9.2 | 1.7 | Small tubers. Large lenticels. Rough shape. Dark russet skin. |
| Katahdin | 312.1 | 269.9 | 86.1 | 9.8 | 3.6 | Nice shape. Light colored-smooth. |
| Norchip | 283.1 | 231.8 | 81.9 | 11.6 | 3.6 | Rough shape. Nice white. |
| Superior | 206.5 | 166.8 | 81.0 | 13.4 | 6.9 | Small. Deep eyes. |
| LSD .05 | 135.6 | 103.4 | 12.1 | 5.62 | --- | |
| .01 | 183.2 | 139.5 | 16.3 | 7.59 | --- | |

- 1 cultivar = cultivated variety.
- 2 Arranged in order of marketable yields.
- 3 MKT= marketable or essentially U.S. No. 1 grade.
- 4 LSD= least statistically significant difference.

Percent marketable tubers ranged from 89.3 for Haig to a low of 78.0 for Abnaki, Table 10. This may be low for Abnaki since it produced 92.1 percent marketable tubers on mineral soils in 1972, Table 6; likewise, the percentage of Abnaki tubers graded as marketable on muck soils in 1971 was relatively high. A partial explanation may lie in the fact that 1972 was unusually wet and some plots were flooded for extended periods of time resulting in rots and other defects.

Percent marketable values for other cultivars were NY 41, 82.7; Shurchip, 86.4; Kennebec, 82.8; Katahdin, 86.1; Norchip, 81.9; and Superior, 81.0 percent marketable tubers.

NY 41 produced the highest percentage of culls due to overlarge tubers and off-shapes, Table 10. Haig yielded the lowest percentage with 1.7 followed by Shurchip with 2.7 and Katahdin with 3.6 percent. All other entries yielded at least 5 percent cull tubers. Superior produced 13.4 percent B-sized tubers while Kennebec produced 7.0 percent, Table 10; all other entries fell between these two values.

Discussion.--Although performance of cultivars has fluctuated widely from year to year, certain trends are evident. Superior has yielded relatively poorly during the last 5 years with the exception of 1970, Table 11. However, low yields have been partially offset by earliness and resistance to scab. Whether these factors completely compensate for low yields is questionable. For example, in 1972 Superior yielded only 166 cwt. of marketable tubers while NY 41, Shurchip, and Abnaki produced over 300 cwt.; the yield differential was even greater in 1971, Table 11. The early cultivar Haig produced well over 100 cwt. per acre more marketable tubers than did Superior, the standard early cultivar.

Abnaki and Shurchip have yielded very well during the last two years. Both have minor problems. Abnaki is unusually susceptible to hollow heart, especially when tubers become overlarge. Close spacing, 7-8 inches within rows, may help to reduce size and thus lessen the problem. Abnaki tubers are generally smooth and white at harvest and are easily cleaned of muck particles and stains. Palatability in cooked and mashed form has been reported as good to excellent.

Shurchip may be slightly too russeted and dark in color for muck use without thorough washing since particles and stains are fairly difficult to remove. It is a high-yielding cultivar widely used for table stock, and it has chipped relatively well in earlier tests.

NY 41 will be released as "Hudson" in 1973 and approximately 75 acres of seed for grower use will be available in 1974. This selection produced highest yields on mineral soils in both 1971 and 1972 and on muck soils in 1972, Tables 6, 7, 11. Flavor in mashed or cooked form has been reported to be good to excellent. It reportedly does not chip from storage but chips fairly well at harvest. Tubers tend to be susceptible to lenticel enlargement under wet conditions and are usually large, rough in shape and dark-colored. However, NY 41 is worthy of note due to its high yield potential. Closer spacing would probably help to alleviate the size problem, and possibly the tendency toward off-shapes. NY 41 will be tested further at Celeryville in 1973.

Table 11. Average Marketable Yields of Cultivars¹ in Cwt/Acre by Year.
Muck Crops Potato Trials--1968-1972.

| <u>1972</u> | <u>1971</u> | <u>1970</u> | <u>1969</u> | <u>1968</u> |
|--------------|--------------|--------------|--------------|--------------|
| NY 41 | Abnaki 360 | Katahdin 326 | Norchip 221 | Katahdin 418 |
| Shurchip 309 | Shurchip 328 | Superior 264 | Katahdin 173 | Norchip 412 |
| Abnaki 302 | Norchip 315 | Shurchip 239 | Shurchip 168 | Superior 355 |
| Kennebec 296 | Haig 311 | Norchip 217 | Superior 128 | --- |
| Haig 290 | Katahdin 308 | --- | --- | --- |
| Katahdin 270 | Superior 159 | --- | --- | --- |
| Norchip 232 | --- | --- | --- | --- |
| Superior 167 | --- | --- | --- | --- |

Haig will be dropped from further trials due to the fact that its characteristics have been relatively well documented in years past. Tubers are generally small, rough in shape and skin texture, and unattractive. It is early and yields fairly well.

Cultivars to be tested in 1973 include Superior, Katahdin, Kennebec, Abnaki, Shurchip, Norchip, NY 41 ("Hudson"), Penn 71 and possibly 2 or 3 seedlings from observational planting on mineral soils, Table 2.

MARIETTA TESTS-1972

A substantial but declining acreage of late summer potatoes is situated in the southeastern corner of Ohio along the Ohio River. Crops are planted in early April, harvested in July and August, and sold at harvest as table stock. Chipping has not been considered a realistic market outlet due to the immature condition of tubers at harvest.

Ten potato cultivars were evaluated for late summer cropping at Marietta in 1972. The following selections were studied:

| Early | Midseason |
|----------|-----------|
| Superior | Katahdin |
| Haig | Onaway |
| Alamo | Shurchip |
| Cobbler | Chippewa |
| Seminole | Abnaki |

These represented a wide range of characteristics, Table 12. For purposes of comparison, Superior is included as a standard for early cultivars and Katahdin, for midseason entries.

Methods

Untreated seed pieces were planted on April 12 in Wheeling Gravelly Loam. This site was planted to potatoes in 1971. A rye cover crop was plowed down along with 1000 lbs./acre of dolomitic limestone prior to planting as dictated by results of soil tests. Fertilizer at the rate of 1100 lbs./acre of 12-12-12 was banded at planting. Seed pieces were spaced 9.5 inches apart in 34-inch rows. Plots consisted of double 40-foot rows of 50 seed pieces each and were replicated 3 times to facilitate statistical analysis. Di-Syston at 20 lbs./acre of 15% granules was banded at planting. Weed control was achieved by a combination of mechanical cultivation and post emergence application of Eptam at 4 lbs./acre. Fungicides and additional insect control were used as needed. Irrigation was not necessary in 1972. Precipitation by month amounted to: April (12-30), 3.35 inches; May, 4.35; June, 4.70; July, 3.10; and August (1-2), none.

Table 12. Origin, Year Released, Recognized Disease Resistance, Season of Maturity and General Characteristics of Entries. Marietta Plots, 1972.

| Cultivar | Origin | Year Released | Resistance To: | Characteristics |
|----------|------------------|---------------|--|---|
| Superior | Wisc. | 1961 | Scab, Late Blight | Kennebec x Merrimack. Standard early cultivar in Ohio. |
| Haig | Nebr. | 1957 | Scab, Virus X | Later strain of Haig. Claimed to set lighter. |
| Alamo | USDA & Texas | 1967 | Late Blight Scab, mild mosaic Net Necrosis | Shallow eyes; smooth, early. Widely adopted. |
| Cobbler | Unknown | Unknown | Virus A | Widely adapted. Early. Susc. to most viruses, scab. |
| Seminole | USDA & Frito-Lay | 1969 | Mild mosaic. V. wilt (mod.) | Adapted to the South. |
| Katahdin | USDA | 1935 | Leaf Roll, Mosaic Yellow Dwarf | Widely adapted standard cultivar. Same parentage as Chippewa. |
| Onaway | USDA & Mich. | 1957 | Scab, Late blight (Mod.) | Susc. to Fusarium wilt. |
| Shurchip | Nebr. | 1968 | Scab. Tolerant to V., F. Wilts | Attractive, high yields. Susceptible to late blight. |
| Chippewa | USDA | 1933 | Mild mosaic | Very susceptible to Leaf Roll |
| Abnaki | USDA, Me. & N.Y. | 1971 | V. wilt, Leaf Roll, Mild Mosaic | High yields. Susc. to late blight. |

Table 13. Yields, Percent of Perfect Stand and Comments.
Marietta Plots, 1972.

| Cultivar | Marketable Cwt/A. | % Mkt. | % B's | % Culls | % Stand | Comments |
|----------|----------------------|-----------|----------|------------|------------|--|
| Shurchip | 415.7 | 91.8 | 5.8 | 2.4 | 97 | Uniform size. Partly green at harvest. |
| Onaway | 364.5 | 88.0 | 7.4 | 4.6 | 93 | Lot with most culls. |
| Abnaki | 336.2 | 93.8 | 5.8 | 0.4 | 93 | Least culls. Wide size range. High grades. Partly green when shredded. |
| Chippewa | 328.3 | 90.0 | 8.8 | 1.2 | 92 | Attractive. Few culls. Some green when shredded. |
| Superior | 321.5 | 93.8 | 4.6 | 1.6 | 92 | Attractive. High grades. |
| Haig | 305.4 | 83.6 | 13.2 | 3.2 | 94 | Highest % B's, Lowest % Marketable Partly green when killed. |
| Seminole | 297.6 | 92.4 | 4.0 | 3.6 | 97 | Red-tinged eyes. 5% sprouted. Lowest % B's. Some green when killed. |
| Cobbler | 284.8 | 88.2 | 8.8 | 3.0 | 95 | Enlarged lenticels. |
| Alamo | 267.1 | 85.4 | 12.0 | 2.6 | 89 | Attractive. Wide size range. Lowest percent stand. |
| Katahdin | 262.1 | 91.0 | 7.6 | 1.4 | 90 | Fair plant vigor. |

Vines were shredded on August 1 and plots were dug mechanically on August 2 for a growing season of 113 days. Tubers were picked up by hand and weighed. Fifty-pound samples were then collected from each plot for grading into size and quality categories. Samples of "Marketable" tubers, i.e., A-size tubers fairly free of external defects, were collected for vascular discoloration and chip tests. Chip test results will be reported later.

Results

Yield and Tuber Defects.--Shurchip produced highest average marketable yields with 415 cwt. per acre of essentially U.S. No 1 tubers, Table 13. The term "Marketable Yield" was used due to insufficient time to precisely classify borderline tubers. Onaway yielded second highest with 364 cwt.; Abnaki, third with 336; Chippewa, fourth with 328; and Superior ranked fifth with a yield of 321 cwt./acre of marketable tubers. Interestingly, Katahdin ranked last in yield with 262 cwt.

Abnaki and Superior produced 93.8 percent marketable tubers and led in this category. Other cultivars exceeding 90 percent were Seminole, 92.4; Shurchip, 91.8; Katahdin, 91.0; and Chippewa, 90.0 percent marketable. Haig produced the lowest percentage of marketable tubers with 83.6 percent.

Haig and Alamo produced the highest percent of B-size tubers with 13.2 and 12.0 respectively. Seminole and Superior yielded the lowest percentage of B's, 4.0 and 4.6 percent. Cultivars producing the lowest percentage of culls were Abnaki, 0.4 percent; Chippewa, 1.2; Katahdin, 1.4; and Superior, 1.6 percent. Onaway led in cull production with 4.6 percent.

Vascular Discoloration.--Examination of composite 21-tuber samples per cultivar showed Cobbler and Seminole to be most susceptible to vascular discoloration with 23.8 and 23.0 percent affected tubers, Table 14.

Table 14. Average Percent of Tubers Showing Stem-end Browning. Marietta Trials -- 1972.

| Rank, Low to High | | | |
|-------------------|---|----------|------|
| Abnaki | 0 | Katahdin | 9.5 |
| Haig | 0 | Alamo | 14.3 |
| Onaway | 0 | Chippewa | 14.3 |
| Superior | 0 | Cobbler | 23.8 |
| Shurchip | 0 | Seminole | 23.0 |

It is interesting to note that 5 cultivars, Abnaki, Haig, Onaway, Superior, and Shurchip, showed no evidence of vascular discoloration when harvested at this early date whereas they were fairly susceptible in the later-harvested major trials, Table 9. The fact that vines were not chemically killed at Marietta may have had some bearing. Chemical vine killers have been reported to favor vascular, or stem-end, discoloration in some cases. Attempts to culture Fusarium and Verticillium wilts from the discolored tubers produced negative results in most cases. Fusarium was present in only three tubers.

ACKNOWLEDGMENTS

The Ohio Potato Cultivar Trials are a joint effort of the Ohio Agricultural Research and Development Center, the Cooperative Extension Service and the Ohio Potato Growers Association. Further, individual Ohio growers have played a major role in these tests since their onset.

Special thanks are due to the following growers on whose farms tests plots were located in 1972:

Donald Becker and Son, Tuscarawas County -- No. 1
James Pochedly, Portage County -- No. 2
Douglas Michael, Champaign County -- No. 3
Harold Thompson, Columbiana County -- No. 4
Ernst and Perry tritten, Columbiana County -- No. 5
Ivan and Galen Moomaw, Wayne County - No. 6
Robert Husted, Defiance County -- No. 7
Louis Huck, Washington County -- Marietta

Appreciation is also extended to Mr. David Kelly, Manager of the Ohio Potato Growers Association, for help with harvest and grading operations and to Dr. Wilbur A. Gould, Department of Horticulture, The Ohio State University for conducting chipping and storageability tests.

This page intentionally blank.

This page intentionally blank.

