

MISSISSIPPI AGRICULTURAL EXPERIMENT STATION
A. & M. College, Mississippi
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REPORT OF
**CERTIFIED IRISH POTATO SEED
TESTS FOR 1927**

By

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Preliminary tests on the value of certified Irish potato seed under Mississippi conditions were conducted in 1925 at the Raymond Branch Experiment Station and in 1926 at the South Mississippi Branch Experiment Station. The results from these tests clearly indicated that certified seed are usually superior to uncertified seed. They also showed that certain strains of certified seed would produce more marketable potatoes than

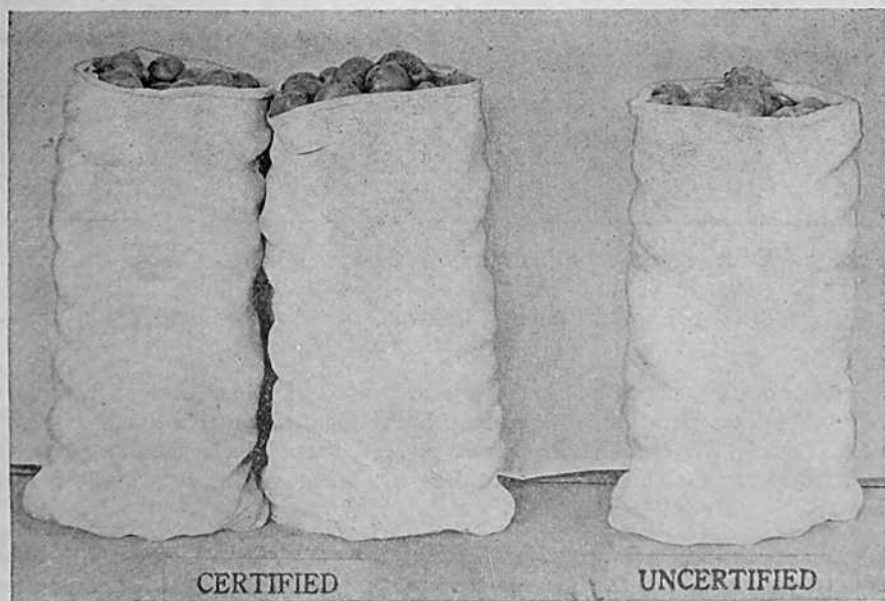


Fig. 1. Highest and lowest yielding strains of Triumphs in College Test. Certified from Nebraska—Uncertified from Columbus.

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others. In view of these facts, it was decided to conduct these tests over a period of years to give the potato growers and gardeners of Mississippi reliable information on the value of different strains of certified and uncertified Irish potato seed.

By the term "certified seed," we refer to potato seed that have been carefully inspected in field and in storage and certified to be relatively true to variety and free from all seed borne diseases by the proper officials of a certified seed growers association.

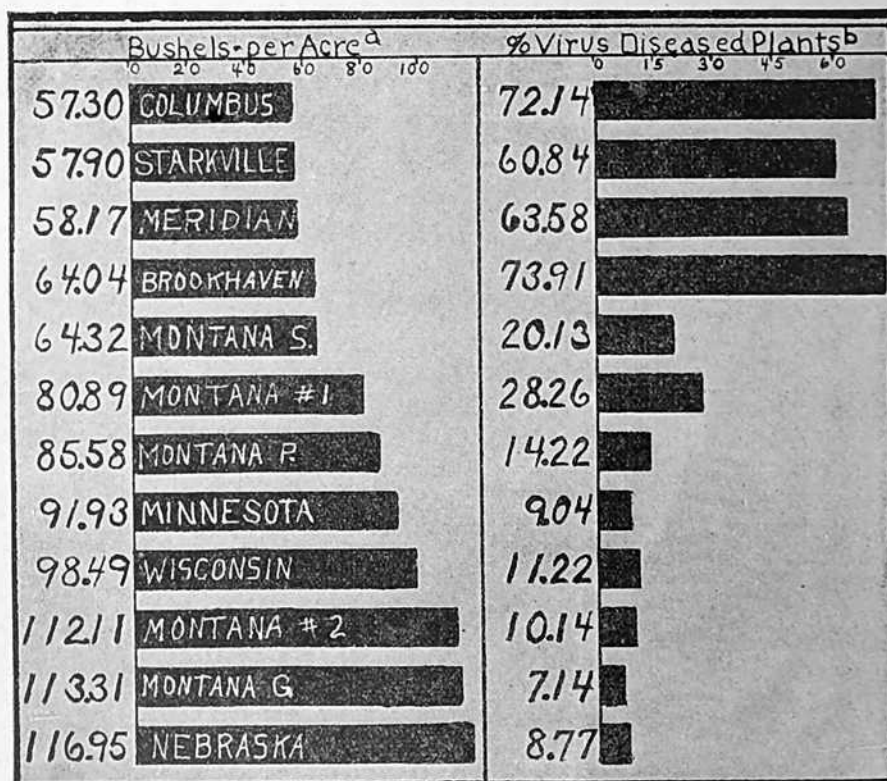


Fig. 2. College test of the Triumph variety.

(a) Average of 10 plats.

(b) Total per cent of mosaic, leaf-roll, spindle-tuber, and weak plants.

Growers are urged not to be misled by unscrupulous dealers who certify "their own potatoes." Such seed have been sold in this State as "certified seed." All certified Irish potato seed should be accompanied by a certificate tag fastened to the container in such a way as to provide a seal for the container.

The main object in certifying Irish potato seed is to insure their freedom from certain infectious diseases; especially those which cannot be controlled by seed treatment or by spraying. The principal diseases of

this class are mosaic, leaf-roll, and spindle-tuber. Each of these diseases is caused by an unknown infectious principle called virus which can be transmitted from one plant to another by transferring sap of a diseased plant to a healthy one. This virus is carried over the winter in the tubers from diseased plants. A brief description of each of these diseases is as follows:

Mosaic. This disease is more severe on the Triumph and Green Mountain varieties than on the Cobbler variety. The leaves of the infected plants are usually crinkled or puckered or mottled with irregularly distributed yellowish areas. The crinkled or puckered type of mosaic (rugose) seems to be more prevalent in this State. This may be due, however, to the fact that the mottled type of mosaic (mild) is masked by bright sunlight and high temperature. This masking does not reduce the severity of the disease. The tubers are of normal shape, making tuber selection impossible. The plants are usually smaller, except in mild cases, and the yield may be reduced from ten to eighty per cent.

Leaf-Roll. This disease is indicated by the upward rolling of the margins of the lower leaves of the plant. The rolled leaves are thicker and stiffer to the touch than normal leaves and their tips usually become lighter in color with small dark necrotic areas. Diseased plants are smaller than healthy plants and generally have a yellowish color. The average yield is greatly reduced. No evidence of the disease can be found on the tubers.

Spindle-Tuber. Symptoms of this disease vary greatly with varieties of potatoes. Usually, however, the symptoms are more erect and spindling stalks; smaller, more erect, and somewhat darker green leaves; and more spindling or elongated tubers than healthy plants. In the Triumph variety, the tubers are lighter in color than in healthy plants and may not be elongated as much as in some other varieties. The leaves are also slightly rolled at the margins and may be slightly crinkled.

The work this year was conducted cooperatively by the Main Experiment Station at the College, South Mississippi, and Raymond Branch Experiment Stations, and the Mississippi State Plant Board. The tests were enlarged to include representative samples of seed from most of the certified Irish potato seed growers associations.

MAIN STATION TEST

The potatoes at the Main Station were planted February 23 on a light sandy loam soil. They were planted 14 inches apart in rows 3½ feet wide and 25 feet long. A large number of replications (10 for Triumphs and 11 for Cobblers) of each sample of seed were made and arranged in such a way as to overcome soil variation. An application of 1000 pounds per acre of an 8-4-4 (P-N-K) fertilizer was made before planting. Before cutting, the seed were treated for thirty minutes in a 1-1000 solution of corrosive sublimate. Care was taken in cutting the potatoes to avoid irregularities which might occur from seed pieces of different sizes. Readings on the prevalence of virus diseases were made April 25. The potatoes were harvested between June 2 and June 4, sorted by hand, and weigh-

ed in the field. The results from this test are recorded in Tables 1 and 2 which are self-explanatory.

TABLE 1.

Summarized Results from the Main Station Test of Certified and Uncertified Irish Potato Seed of the Triumph Variety from Different Sources.

KIND AND SOURCE OF SEED	Per Cent of Germination	Per Cent Mosaic Plants	Per Cent Leaf-roll, Spindle-tuber and Weak Plants	Bushels per acre		Rank in Value
				Marketable	Culls	
Montana, Redstone, J. F. Sharples.....	76.61	16.39	9.74	64.32	6.22	8
UNCERTIFIED, Starkville, Miss.....	82.59	50.60	10.24	57.90	9.86	12
Montana, Bozeman, Gallatin V. Seed Co.	94.59	.95	6.19	113.31	13.24	2
Wisconsin, Spooner, Agr. Exp. Sta.....	96.35	5.61	5.61	98.49	11.41	4
UNCERTIFIED, Brookhaven, Miss.....	93.24	70.05	3.86	64.04	9.99	9
Montana, Bozeman, Agr. Exp. Sta.No. 2	93.25	5.31	4.83	112.11	13.24	3
Nebraska, Alliance,W.Neb.Cert.Sd.As'n.	97.74	5.99	2.78	116.95	15.06	1
UNCERTIFIED, Columbus, Miss.....	90.53	69.65	2.49	57.30	8.59	11
Montana, Redstone, Geo. W. Points.....	83.08	5.39	8.83	85.58	8.08	6
Minn. Clearwater Farmers Co-op P.As'n.	90.53	3.33	5.71	91.93	11.84	5
UNCERTIFIED, Meridian, Miss.....	82.52	52.17	11.41	58.17	6.26	10
Montana, Bozeman, Agr.Exp. Sta.No. 1	89.88	13.04	15.22	80.89	10.88	7

TABLE 2.

Summarized Results from the Main Station Test of Certified and Uncertified Irish Potato Seed of the Cobbler Variety from Different Sources.

KIND AND SOURCE OF SEED	Per Cent of Germination	Per Cent Mosaic, leaf-roll, Spindle-tuber and Weak Plants	Bushels per acre		Rank in Value
			Marketable	Culls	
Maine, Caribou, J. C. Briggs.....	91.86	2.70	117.09	16.80	4
UNCERTIFIED, Meridian, Miss.....	91.77	17.49	98.06	11.07	9
Vermont, Greenboro, Chas. Lapierre.....	97.12	4.66	114.24	13.35	5
Minnesota, E. Grand Forks, A. A. Platt.....	90.53	10.90	99.10	12.35	8
New York, Tully, F. S. Hollenbeck.....	90.53	13.64	94.67	8.97	10
UNCERTIFIED, Starkville, Miss.....	86.42	52.38	77.25	8.78	12
New Jersey, Elmer, J. Harry Kandle.....	93.00	11.06	99.58	9.15	7
Vermont, Rutland, L. K. Osgood.....	95.06	3.03	137.79	11.40	1
Nebraska, Bay Springs, Geo. F. Koehnke.....	100.00	4.94	131.28	14.58	2
UNCERTIFIED, Columbus, Miss.....	98.35	15.90	106.35	11.12	6
Michigan, Manton, Geo. Harrison.....	98.77	7.08	124.75	10.32	3
New Jersey, Elmer, J. H. Kandle (K. Pride).....	94.24	41.48	80.64	7.25	11

TABLE 3.

Summarized Results from the South Mississippi Branch Station Test of Certified and Uncertified Irish Potato Seed of the Triumph Variety from Different Sources.

KIND AND SOURCE OF SEED	Per Cent of Germination	Per Cent Mosaic, leaf-roll, Spindle-tuber and Weak Plants	Bushels per acre		Rank in Value
			Marketable	Culls	
Wisconsin, Phillips, Conradi Bros.	96.5	4.6	129.3	19.3	2
UNCERTIFIED, Poplarville, Miss.	95.5	80.7	97.4	21.0	5
Montana, Bozeman, Agr. Exp. Sta. No. 1	80.3	9.2	89.5	19.3	8
Montana, Bozeman, Agr. Exp. Sta. No. 2	85.4	12.9	102.1	20.3	4
Montana, Redstone, J. F. Sharples	23.9	22.8	48.1	12.8	10
Nebraska, Alliance, Nebr. Cert. Growers Assn.	95.0	4.9	134.1	25.9	1
Montana, Gallatin Valley Seed Co.	74.2	8.3	92.8	18.6	6
Minnesota, Moorehead, E. D. Askegaard	95.7	5.5	127.4	21.0	3
UNCERTIFIED, Hattiesburg, Miss.	93.3	56.0	92.2	21.7	7
UNCERTIFIED, Gulfport, Miss.	80.0	50.3	65.1	21.0	9

TABLE 4.

Summarized Results from the South Mississippi Branch Station Test of Certified and Uncertified Irish Potato Seed of the Cobbler Variety from Different Sources.

KIND AND SOURCE OF SEED	Per Cent of Germination	Per Cent leaf-roll, Spindle-tuber and Weak Plants	Bushels per acre		Rank in Value
			Marketable	Culls	
Maine, Caribou, John McElwain	91.0	6.7	128.0	29.8	2
New York, Kirkville, Wilcox & Jones	94.8	5.6	105.4	27.5	5
Michigan, Midland, M. C. Coates	90.7	2.9	132.2	21.7	1
Nebraska, Haysprings, Geo. F. Koehnke	95.9	11.0	115.7	38.0	3
UNCERTIFIED, Hattiesburg, Miss.	84.0	13.8	108.1	27.5	4

SOUTH MISSISSIPPI BRANCH STATION TEST

The land on which the test was conducted at the South Mississippi Branch Station was of a dark sandy loam type. After the soil was put in good tilt by breaking flat and harrowing, rows were laid off 3½ feet apart. The field was divided into two parts lengthwise making each row, which became a plat, 89 feet long or 1/140 of an acre. Each half of the field was large enough to have two series making four series in all. The order of plats was reversed in each half of the field to overcome soil variation. On January 28, approximately 1200 pounds of an 8-6-6 (P-N-K) fertilizer were applied in the drill per acre. On February 5, after the seed had been treated for one hour in a 1-1000 solution of bichloride of mercury, they were planted 12 inches apart in the row. Readings on the amount of virus diseases were made on April 11. The potatoes were cleanly cultivated and dusted for insects and diseases until mature. The crop was harvested on May 24, graded by hand, and weighed in the field. The results from this test are given in Tables 3 and 4. It will be noticed in Table 3 that the certified samples from Montana did not germinate very well. This is said to be due to the fact that some of the potatoes were injured by frost during shipment.

TABLE 5.

Summarized Results from the Raymond Branch Station Test of Certified and Uncertified Irish Potato Seed of the Triumph Variety from Different Sources.

KIND AND SOURCE OF SEED	Per Cent of Germination	Per Cent Mosaic, leaf-roll, Spindle-tuber and Weak Plants	Bushels per acre		Rank in Value
			Marketable	Culls	
UNCERTIFIED, Jackson, Miss.	44.55	10.36	100.2	23.0	8
Montana, Bozeman, Gallatin Valley Seed Co.	49.39	8.77	83.5	23.2	7
Nebraska, Alliance, W. Neb. Cert. Sd. As'n.	61.89	8.03	90.6	22.0	6
Montana, Bozeman, Agr. Exp. Sta. No. 1	65.93	15.29	97.8	25.3	4
Montana, Redstone, Geo. W. Points	64.72	14.26	91.9	24.4	5
Montana, Bozeman, Agr. Exp. Sta. No. 2	75.40	9.09	119.2	26.4	1
Minnesota, Moorehead, E. A. Askegaard	68.14	8.72	100.6	27.5	2
UNCERTIFIED, Vicksburg, Miss.	75.40	48.93	68.1	17.6	8

RAYMOND BRANCH STATION TEST

The soil on which this test was made was of a medium heavy sandy loam type. The field was divided into two parts lengthwise, making each row 124½ feet long or 1/100 of an acre. Two series of rows were made on each half of the field with the order of planting reversed to take care of any soil variation that might occur. It was planned to plant the potatoes about February 15 but due to wet lands the planting was postponed until March 7 at which time, 1300 pounds of an 8-4-6 (P-N-K) fertilizer were

applied in the drill and the seed pieces cut after being treated for thirty minutes in a 1-1000 solution of bichloride of mercury. Due to continuous wet weather, the potatoes could not be planted until March 17. This delay in planting probably explains the poor germination. The potatoes were planted 12 inches apart in 3½ foot rows. Readings on the prevalence of virus diseases were made on May 9 and 10. The tubers were harvested on June 5, sorted by hand, and weighed in the field. The results of this test are given in Tables 5 and 6.

TABLE 6.

Summarized Results from the Raymond Branch Station Test of Certified and Uncertified Irish Potato Seed of the Cobbler Variety from Different Sources.

KIND AND SOURCE OF SEED	Per Cent of Germination	Per Cent Mosaic, leaf-roll, Spindle-tuber and Weak Plants	Bushels per acre		Rank in Value
			Marketable	Culls	
Vermont, Williamston, Hill Crest Farms.....	42.74	14.52	90.5	15.9	4
New York, Kirkville, Wilcox & Jones.....	61.29	4.80	105.6	17.4	2
Nebraska, Bay Springs, Geo. F. Koehnke.....	64.51	5.62	82.9	32.9	5
Michigan, Charlvoy, W. K. Straw.....	67.54	9.10	100.6	15.1	3
Maine, Washburn, V. E. Wilder & Son.....	80.04	3.81	119.1	17.7	1

SUMMARY AND RECOMMENDATIONS

This circular gives the results of the experiments conducted at the Main Experiment Station at the College, South Mississippi, and Raymond Branch Experiment Stations in which a total of fifty-two samples of certified and uncertified Irish potato seed were tested for prevalence of virus diseases and yielding ability. The summarized data from these experiments are tabulated in Tables 1 to 6. From this data, it is obvious that certified seed are much superior to uncertified seed. This is especially true of the Triumph variety in which a large number of the uncertified samples were heavily infected with mosaic. The Cobbler variety, being more resistant to mosaic, did not show as great differences between certified and uncertified samples as the Triumph.

Figures 1 and 2 show a fairly close negative correlation between the percentage of diseased plants to the yielding ability of Irish potato seed.

Seed dealers, managers of Farm Bureaus, and potato growers are urged to secure good, certified Irish potato seed for the 1928 crop. Certified Irish potato seed can be purchased direct from the grower through the secretary of his seed growers association for only twenty cents to one dollar more per bushel than the market value of common seed. A list of certified seed growers associations can be secured from the State Plant Board, A. & M. College, Mississippi.

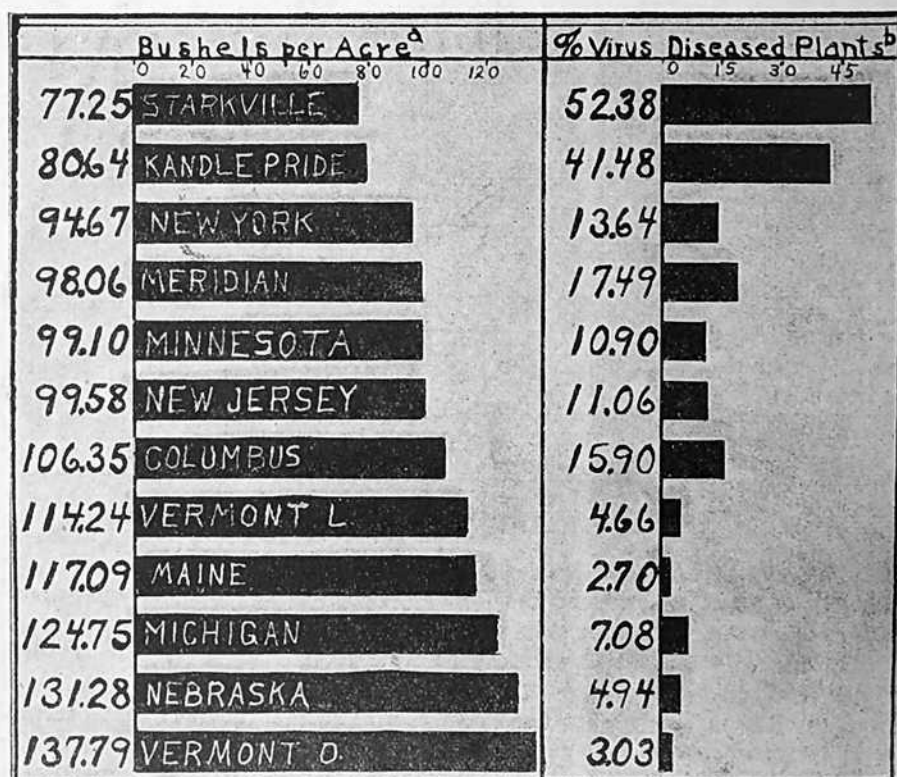


Fig. 3. College test of the Cobbler variety.

- (a) Average of 11 plats.
 (b) Total per cent of mosaic, leaf-roll, spindle-tuber, and weak plants.