

Certified Seed Potatoes Prove Their Value

By
F. Gray Butcher¹

Certified seed potatoes yielded from 27% to 32% more than non-certified potatoes in a demonstration planting conducted by the State Extension Service and cooperating County Agents at Park River during the 1945 season. These increased yields appeared to be due to the greater freedom from various diseases in the certified seed lots.

County Extension Agents from Traill, Grand Forks, Walsh, and Pembina counties secured the seed used in the demonstration from potato growers in their counties. Each agent obtained from 5 to 10 lots of certified seed and the same number of lots of non-certified seed of both Cobbler and Triumph varieties. They secured 30 lots of certified Cobblers, 33 lots of non-certified Cobblers, 30 lots of certified Triumphs, and 28 lots of non-certified Triumphs. These seed lots were taken from the supply the growers intended to plant, and thus represented seed actually being used for commercial production.

At planting time, the different lots of certified seed of each variety from each county were mixed together to provide a single composite sample of each county's certified seed of each variety. In a like manner, a single composite sample of each county's non-certified seed of each variety was obtained. This procedure provided four lots from each county, as follows: certified Cobblers, non-certified Cobblers, certified Triumphs, non-certified Triumphs. These four lots from each county were planted, side by side, on May 14th, in plots of six rows with 75 hills each, or 450 hills for each lot.

To avoid seed piece contamination, all certified seed was cut first with disinfected knives, and the planter was thoroughly disinfected with formaldehyde solution after planting each lot.

Throughout the growing season, the entire planting received regular cultivation, and two spray applications of 0.05% DDT for insect control. Disease readings were recorded on August 9th, and the plantings harvested on October 17th. The yield and disease data thus obtained for the individual plots are shown in Tables 1 and 2, with a summary shown in Table 3.

¹Extension Entomologist and Plant Pathologist. The demonstration herein reported was conducted by the State Extension Service Potato Committee and County Extension Agents. The Potato Committee is made up of State Extension Specialists and Supervisors whose fields of work are directly concerned with potato production problems. The author, as chairman of this Committee, is reporting for the entire Committee on this activity.

Table 1.—Stand and Yield Data—Potato Demonstration Plots, 1945

County	Kind of Seed	No. of Skips	% Stand	Net Yield (lbs)*	Calculated Yield, Bu. per acre**
Traill	Certified Cobbler	6	98.8	429	192.0
	Common Cobbler	6	98.8	219	98.5
	Certified Triumph	11	97.5	351	158.3
	Common Triumph	8	98.2	238	106.9
Grand Forks	Certified Cobbler	14	96.9	273	124.8
	Common Cobbler	9	98.0	233	105.0
	Certified Triumph	9	98.0	270	120.8
	Common Triumph	18	96.2	181	83.2
Walsh	Certified Cobbler	17	96.0	257	116.9
	Common Cobbler	12	97.3	253	114.9
	Certified Triumph	30	93.3	245	114.9
	Common Triumph	20	95.6	229	105.0
Pembina	Certified Cobbler	11	97.5	254	114.9
	Common Cobbler	16	96.4	229	105.0
	Certified Triumph	17	96.0	209	91.1
	Common Triumph	19	98.8	167	77.2

*Yield after running over standard potato grader.

**Calculated on basis of 100% stand.

In spite of extensive variation in yields from the different county lots, the certified seed consistently out-yielded the common stock. At least a portion of the yield variation is due to soil differences, which were noticeable throughout the season. It is felt that the average yield data in Table 3 represent a fair comparison between the performance of certified seed and common seed. These data reveal an increase of 27% from certified Cobblers over common Cobblers, and about 32% from certified Triumphs over common Triumphs.

All County Agents cooperating in these trials found it difficult to obtain common seed three or more years removed from certification. The Traill County Agent reported that he had to contact about 15 growers to secure 5 lots of common stock. Of these 5 lots, two were only one year removed from certification. The Grand Forks County Agent estimated that two-thirds of the

table stock potato growers in his county were planting stock that was either certified, or not more than 2nd crop removed from certification.

The disease counts shown in Table 2 and summarized in Table 3, show many interesting items. It is striking that the total of all diseases was so consistently higher on the common seed stock. This fact makes the yield differences obtained readily understood. It is of interest to note that the incidence of Purple Top follows this same relationship.

The amount of ring rot increased materially through the plot after the disease counts were made. It is of interest to note that this disease was observed in cutting the seed in both the Cobbler and Triumph samples from Traill County and in the Triumph samples from Walsh County. The absence of extensive ring rot in the Pembina County lots, which were cut and planted last, is evidence

Table II.—Disease Counts—Number Hills Infected, August 9th

County	Kind of Seed		Crinkle Mosaic	Spindle Tuber	L.R. or M. Mosaic*	Root Rot**	Ring Rot	Purple Top	Total all diseases
aill	Certified	Cobbler	2	....	....	1	....	....	3
	Common	Cobbler	....	7	2	3	4	12	28
	Certified	Triumph	....	1	2	1	....	4	8
	Common	Triumph	6	4	1	15	16	11	53
aid Forks	Certified	Cobbler	....	3	....	2	1	4	10
	Common	Cobbler	12	9	3	11	5	1	41
	Certified	Triumph	2	1	2	4	....	2	11
	Common	Triumph	38	1	5	28	4	4	80
ash	Certified	Cobbler	1	3	....	1	....	....	5
	Common	Cobbler	7	6	5	4	5	1	28
	Certified	Triumph	1	1	1	5	1	2	11
	Common	Triumph	12	3	4	3	5	4	31
abina	Certified	Cobbler	....	2	....	9	....	1	12
	Common	Cobbler	2	5	3	13	....	1	24
	Certified	Triumph	1	....	....	5	1	4	11
	Common	Triumph	46	13	1	6	....	10	76

Leaf rolling or mild mosaic
Blackleg, Rhizoctonia or other root injury.

that handling procedures were effective in preventing contamination among the various seed lots.

These results verify previous experimental information, but are considered of special interest because of the direct relationship to seed potatoes actually found

in Red River Valley production. Similar demonstrations elsewhere have shown similar findings (see Wis. Agr. Exp. Sta. Bulletin 466, Annual Report of the Director, Agricultural Experiment Station, 1945) and the results definitely show that source of seed is a major item in profitable potato production.

Table III.—Average Stand, Yield, and Disease—All County Lots

Kind of Seed	Avg. % Stand	Bush-els* per acre	No. Hills Infested with						Total all diseases
			Crinkle Mosaic	Spindle Tuber	L.R. or M. Mosaic**	Root Rot***	Ring Rot	Purple Top	
Certified Cobbler	97.3	136.6	0.75	2.0	....	3.25	0.25	1.25	7.50
Common Cobbler	97.6	106.9	5.25	6.75	3.25	7.75	3.50	3.75	30.25
Certified Triumph	96.2	122.7	1.0	0.75	1.25	3.75	0.50	3.0	10.25
Common Triumph	96.5	93.1	25.50	5.25	2.75	13.00	6.25	7.25	60.00

*Yields calculated on basis of 100% stand

**Leaf rolling or mild mosaic

***Blackleg, Rhizoctonia, and other root injury.