Russet Norkotah - A New Russet Potato Variety

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Dollarwise, the potato continues to be the top horticultural crop grown in North Dakota. In 1986, North Dakota was second to Idaho in acres planted and fourth in overall U.S. production. Another interesting fact is that Americans are eating more potatoes. The annual per capita consumption is now over 125 pounds; up almost 10-15 pounds from that ten years ago. This is good news for the potato grower and it also indicates the need for new and improved potato varieties.

Potato breeding continues to be one of the top priorities in the horticulture and plant pathology departments at North Dakota State University. On March 1, 1987 the North Dakota Agricultural Experiment Station and the U.S. Department of Agriculture announced the release of a new potato variety named Russet Norkotah. This was the 14th potato variety released by NDSU since Norland was released in 1957.

Russet Norkotah, formerly known as ND534-4Russ, resulted from a cross between two numbered North Dakota selections, ND9526-4Russ and ND9687-5Russ. Together, these russet parents have in their pedigree Norgold Russet, Nooksack, A6673-4Russ, A119-1, A598-3, A501-13, Kennebec, Early Gem and Russet Burbank. The pedigree selections with the A prefix are from the USDA potato breeding program at Aberdeen, Idaho.

The cross resulting in Russet Norkotah was made in the greenhouse in 1976 and the seedling was grown in the field at the Langdon Agricultural Experiment Station in 1977 at which time the original selection was made. Russet Norkotah has been tested in statewide trials in North Dakota for six years (1981-1986) and was in the North Central Regional Potato Variety Trial for three years (1982-1984). In 1987, 2,595 acres of certified seed of Russet Norkotah were grown in North Dakota, while in 1986 there were 746 acres. Certified seed **is** also produced in **Wisconsin,** Minnesota, Michigan, Montana and other states and Canadian provinces.

When tested for six years in statewide trials, Russet Norkotah was comparable to the yield of NorKing Russet but outyielded both Norgold Russet and Russet Burbank. During the six years of testing, Russet Norkotah yielded approximately 60 cwt more than Russet Burbank (Table 1). In the North Central Regional Potato Variety Trial, Russet Norkotah was first in overall performance in 1982 and 1983 and second in 1984. The North Central Regional Potato Variety trials are conducted in 13 states and two Canadian provinces (Table 2).

Russet Norkotah is higher in total solids than Norgold Russet but lower than Russet Burbank and NorKing Russet (Tables 3 and 4). Total solids might be a limiting factor for

Table 1. U.S. No. 1 yield (T/ha) of Russet Norkotah and standard varieties grown at Grand Forks and Park River, ND (1981-1986)

	1981		1982		1983		1984		1985		1986		Average	
Varieties	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River
Russet Norkotah	23.5	13.9	21.6	25.6	21.1	22.9	30.2	17.8	18.0	21.6	24.7	33.7	23.2	22.6
NorKing Russet	25.0	13.9	21.1	28.1	19.1	26.9	28.8	24.4	21.4	21.0	15.8	27.1	21.9	23.6
Norgold Russet	27.0	13.9	18.0	20.4	14.9	23.9	21.2	16.9	20.3	24.2	21.5	24.0	20.5	20.6
Russet Burbank	22.9	12.3	12.8	20.0	8.6	8.2	16.6	17.8	16.1	18.0	21.0	17.5	16.3	15.6
Average	**24.6**	**13.5**	**18.4**	**23.5**	**15.9**	**20.5**	**24.2**	**19.2**	**19.0**	**21.2**	**20.8**	**25.6**	**20.5**	**20.6**

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the production of french fries in some areas. However, Russet Norkotah should process well out of the field and early in the storage season.

This new russet variety is medium late in maturity but sets its tubers early in the season. Observations have shown it to be about a 90 day variety which would be almost as early as Norgold Russet and much earlier than Russet Burbank.

Russet Norkotah tubers are long to slightly oblong and have a beautiful russet skin. Tubers are smooth with shallow, bright golden eyes.

This new russet produces a high percentage of U.S. No. 1 tubers with very few small or stripper size tubers. This makes it an excellent candidate for the count carton market.

Russet Norkotah is susceptible to most viruses and also to both early and late blight. Although this cultivar is susceptible to infection by PVY, most common strains do not cause typical mosaic symptoms, and in replicated trials, infection of 25 percent of the plants did not significantly reduce yield, grade or specific gravity. A faint mosaic may be observed under optimum conditions for symptom expression. It appears that Russet Norkotah is resistant to PVY, but it should be cautioned that not all strains have been tested. This cultivar may act as a source of inoculum even though no symptoms are observed, however PVY is readily detectable in this cultivar with ELISA tests. It shows symptoms of bacterial ring rot both in the plants and tubers so it is not classified as a bacterial ring rot carrier. In certain years, hollow heart can become a problem, however it is no worse than Norgold Russet.

It is anticipated that a large acreage of Russet Norkotah will be grown in the Pacific Northwest, California, Colorado, Wisconsin, Michigan, Ohio and other spring and early summer producing states. There is a possibility that it will replace Norgold Russet, another NDSU variety, in certain areas. A great deal of enthusiasm has been generated for this variety and it could be one of the best released by NDSU.

Russet Norkotah has been increased by North Dakota and out-of-state seed growers. A list of North Dakota growers may be obtained by contacting the North Dakota State Seed Department, Fargo, ND 58105.

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Table 2. U.S. No. 1 yield (T/ha) of Russet Norkotah and two standard potato varieties grown in the North Central Regional Potato Variety trial (1982-1984).

State or Province	1982			1983			1984		
	Russet Norkotah	Norgold Russet	Russet Burbank	Russet Norkotah	Norgold Russet	Russet Burbank	Russet Norkotah	Norgold Russet	Russet Burbank
Alberta	33.5	31.5	23.6	55.7	42.3	52.6	24.1	21.6	13.8
Manitoba	11.7	7.2	9.1	16.6	20.4	14.7	5.9	6.5	6.8
Colorado	13.9	12.7	2.8	37.3	37.1	25.0	37.2	38.6	36.3
Indiana	—	—	—	—	—	—	25.8	21.7	28.1
Iowa	25.8	13.3	4.9	12.3	4.7	0	13.2	12.9	1.2
Kansas	31.7	22.9	26.3	—	—	—	18.8	14.7	14.1
Kentucky	25.6	30.2	30.9	17.0	9.8	14.6	26.8	14.6	36.7
Louisiana	14.0	8.5	5.6	—	—	—	6.4	14.1	9.2
Michigan	35.6	27.0	36.4	—	—	—	36.7	31.5	29.4
Minnesota	59.8	47.0	62.0	—	—	—	50.4	42.7	55.3
Nebraska	20.2	16.0	5.0	18.4	22.5	7.8	22.5	19.5	15.6
North Dakota	18.9	18.0	7.4	17.1	18.9	12.1	35.1	25.6	19.7
Ohio	46.2	45.2	19.6	13.7	16.3	6.5	20.5	24.0	14.0
South Dakota	27.0	15.5	23.8	18.9	11.2	12.7	31.4	16.3	41.5
Wisconsin	44.2	39.6	50.0	45.4	44.5	52.5	51.0	35.5	62.1
Average	**29.2**	**23.9**	**22.0**	**25.2**	**22.8**	**19.8**	**27.1**	**22.7**	**25.6**

Table 3. Percent total solids of Russet Norkotah and standard varieties grown at Grand Forks and Park River, ND (1981-1986).

Variety	1981		1982		1983		1984		1985		1986		Average	
	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River
Russet Norkotah	20.3	21.5	22.0	20.3	18.8	19.4	21.2	21.4	21.8	22.2	19.4	20.7	20.6	20.9
NorKing Russet	20.3	21.4	23.5	20.7	18.8	19.9	22.0	22.0	21.8	22.2	21.6	19.4	21.3	20.9
Norgold Russet	20.1	20.9	21.6	20.1	17.7	19.0	20.5	20.7	19.9	21.4	18.6	20.1	19.7	20.4
Russet Burbank	20.5	20.9	21.8	21.2	19.2	19.0	19.7	22.0	22.2	21.8	21.4	20.9	20.8	21.0
Average	**20.3**	**21.2**	**22.2**	**20.6**	**18.6**	**19.3**	**20.8**	**21.5**	**21.4**	**21.9**	**20.2**	**20.3**	**20.6**	**20.8**

Impact on Rural North Dakota

Rural North Dakota supplies most of the amenity and other natural resource inputs that contribute to hunting and fishing activities. Wildlife habitat, fishing waters, and fish and wildlife resources are each elements of the state's rural environment. A substantial portion of the $310 million spent by sportsmen in the state in 1986 was spent in rural areas, generating business activity and supporting employment in areas with few job alternatives. Sportsmen's dollars are spent in communities where a few more meals sold and a few more fillups at the service station each day during the hunting season can markedly affect small, service oriented businesses.

Sportsman expenditures generate $1.25 in gross business volume in addition to the $1 spent, for a multiplier of 2.25. In addition, each $1 spent generates $0.48 in personal income and every $82,400 spent by sportsmen supports one job (Coon and Leistritz 1987). Hunters and anglers account for $698 million in gross business volume, $149 million in personal income, and 8,470 jobs in North Dakota. Resident hunters and anglers thus generate 3 percent of gross state product, 2 percent of state personal income, and 3 percent of state employment with little or no investment since these returns stem primarily from the state's natural resource base.

Community and Rural Development Implications

Hunting and fishing contribute not only to the economic well-being of North Dakota, but also to the general welfare of its residents, all without the negative effects of smokestacks or competing with other industries. The opportunity to hunt and fish is a personal intangible that adds to the quality of life. In the search for a match between North Dakota's rural communities and commercial or industrial development, the availability of hunting and fishing is a positive factor.

Rural leaders should look seriously at the potential for increasing hunting and fishing activity in their jurisdictions. It appears to offer large returns to small, rural communities with little investment in a business environment with few viable alternatives.

With upward of 2½ million acres of the state's cropland projected to be placed in the Conservation Reserve Program, there may be enhanced opportunities to increase the social and economic returns to hunting and wildlife enjoyment in the state.

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Table 4. Percent total solids of Russet Norkotah and two standard potato varieties grown in the North Central Regional potato variety trial (1982-1984).

State or Province	1982			1983			1984		
	Russet Norkotah	Norgold Russet	Russet Burbank	Russet Norkotah	Norgold Russet	Russet Burbank	Russet Norkotah	Norgold Russet	Russet Burbank
Alberta	21.3	22.0	20.0	21.4	21.0	23.5	20.8	21.4	21.1
Manitoba	23.5	23.0	23.5	21.4	20.9	21.4	23.1	22.2	22.6
Colorado	18.9	17.5	20.9	14.3	15.0	16.9	20.1	19.7	22.2
Indiana	18.1	18.8	18.4	—	—	—	16.0	15.0	18.1
Iowa	14.0	13.2	15.0	12.9	11.9	14.2	16.7	14.8	16.4
Kansas	21.7	19.2	19.2	—	—	—	18.2	15.0	18.0
Kentucky	17.8	17.3	18.7	18.9	18.1	17.2	20.0	17.2	20.5
Louisiana	16.5	16.5	17.3	—	—	—	15.6	15.4	15.6
Michigan	19.8	18.8	22.7	—	—	—	19.6	18.8	22.2
Minnesota	17.3	16.7	18.6	—	—	—	18.6	18.0	21.8
Nebraska	17.7	16.9	18.2	19.4	19.4	19.9	17.3	17.5	18.2
North Dakota	21.2	20.5	19.2	17.1	17.1	18.8	21.6	20.5	21.2
Ohio	19.4	19.4	20.9	20.4	19.2	19.2	—	—	—
South Dakota	17.8	17.4	18.9	17.3	16.0	17.1	18.4	17.3	21.0
Wisconsin	17.7	16.9	19.9	17.3	16.7	19.2	18.0	16.7	19.9
Average	**18.8**	**18.3**	**19.4**	**18.0**	**17.5**	**18.7**	**18.9**	**17.8**	**19.9**