NorKing Russet, A New Potato Variety

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The potato breeding program at NDSU has been in existence in the Department of Horticulture and Forestry for many years. Since Norland was released back in 1957, there have been 12 varieties released. The most successful of these varieties have been Norland (1957), Viking (1963), Norgold Russet (1964), Norchip (1968), Bison (1974) and Redsen (1983). Together these varieties account for a high percentage of the total production in the Red River Valley and other producting areas.

On March 1, 1985, the NDSU Departments of Horticulture and Plant Pathology and the USDA Agriculture Research Service through the Potato Research Lab at East Grand Forks, Minnesota announced the release of a new variety named NorKing Russet. This variety was formerly known as ND388-1Russ. NorKing is only the second russet released by NDSU since Norgold Russet was released in 1964.

At the time Norgold Russet was released the Red River Valley was growing mostly red-skinned varieties and they were used for fresh pack. Since that time, russet and white-skinned varieties for processing and fresh use have become more popular. A russet variety has a longer shelf life in the store and is probably preferred more by the consumer than red- or white-skinned types.

NorKing Russet resulted from a cross between Nooksack and ND9567-2Russ. Nooksack is a russet variety grown for processing (french fry) in the northwestern states and ND9567-2Russ resulted from a cross between two number selections that have Norchip and B5141-6 in their pedigrees.

The cross resulting in NorKing Russet was made in the greenhouse in 1976 and the seedling was grown in the field at the Langdon Experiment Station in 1977 at which time the original selection was made. It has been increased and tested continuously since 1978. It has been grown in the statewide trial since 1981 and the North Central Regional trials during 1982-1984.

When tested for four years in the statewide trial, NorKing Russet has almost continuously outyielded Norgold Russet (Table 1). It has outyielded Russet Burbank in production of U.S. No. 1's by an average of approximately 70 cwt during the four years testing at two locations, Park River and Grand Forks. In the North Central Regional Trials the performance of the NorKing Russet has shown good yield and has ranked third in 1982 and 1984 and second in 1983 in overall performance. In these same trials total solids, which is a measure of the amount of dry matter in a potato, were quite high in NorKing Russet. This is important for a potato used for processing as high dry matter makes for better quality and a higher yield of the processed product. Tests for four years at two locations showed NorKing Russet to have an overall average of 21.0 percent total solids (Table 2). This can be compared to Norgold Russet and Russet Burbank, which averaged slightly above 20 percent when grown in similar trials.

The tuber type of this new russet is oblong to slightly blocky. The russeting is good and it has shallow eyes, smooth type, and produces a very high percentage of U.S. No. 1 tubers. It is medium in maturity and has excellent vigor. The plant has nice wide, broad leaves and generally good type.

This russet variety is resistant to verticillum wilt and scab but is susceptible to most viruses and other diseases, including late blight and viruses. Observation in other growing areas where early blight is prevalent showed that NorKing Russet is quite susceptible to this disease and should be sprayed regularly with a good fungicide. Under certain conditions some hollow heart has been found in NorKing Russet.

NorKing Russet has been increased by certified and foundation seed growers at Beach, Cando and the Red River Valley area. Only a limited amount of seed will be available for planting in 1985. A list of growers having certified seed of NorKing Russet may be obtained by writing to the North Dakota State Seed Department, NDSU, Fargo, ND 58105 or the Minnesota State Seed Department, 620 State Office Building, St. Paul, MN 55101.

It is expected that the overall use of this russet variety will be for both fresh market and frozen french fries. If hollow heart is not a problem, this selection should be well-suited for the fresh count carton trade and preliminary tests indicate it could be used for frozen french fries. It could also be good for the seed industry in the state as it seems to be adapted to other potato growing areas.

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Table 1. U.S. No. 1 Yield of NorKing Russet and Cultivars Grown at Grand Forks and Park River, ND (1981-1984).

	1981		1982		1983		1984		Average	
	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River
NorKing Russet	223	124	188	251	170	240	257	218	210	208
Norgold Russet	241	124	161	182	133	213	189	151	181	168
Russet Burbank	204	110	114	178	77	73	148	159	136	130
Lemhi	262	198								
Average	233	139	154	204	127	175	198	176		

Table 2. Percent Total Solids of NorKing Russet and Cultivars Grown at Grand Forks and Park River, ND (1981-1984).

	1981		1982		1983		1984		Average	
	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River
NorKing Russet	20.3	21.4	23.5	20.7	18.8	19.9	22.0	22.0	21.2	21.0
Norgold Russet	20.1	20.9	21.6	20.1	17.7	19.0	20.5	20.7	20.0	20.2
Russet Burbank	20.5	20.9	21.8	21.2	19.2	19.0	19.7	22.0	20.3	20.8
Lemhi	22.2	22.2								
Average	20.8	21.4	22.3	20.7	18.6	19.3	20.7	21.6		

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using the information are still needed to meet his needs. This requires more multidisiplinary cooperation than has occurred in the recent past. The "bottom line" is currently a popular term to describe an overall net effect. If we expect soil-conserving crop management systems to be adopted, we need to be able to provide farmers with information leading to and including the "bottom line."

Table 5. Summary of Selected Crop Management Systems.

	Analysis I		Analysis II	
Crop Management System	SL (T/A)	NR ($/A)	$\overline{NR}$ ($/A)	C.V.
F-D	10.82	27.49	34.94	29.72
F-D-SFI	6.77	38.84	44.90	18.25
F-D-SFI(Z)	4.14	39.96		
F-D-WW-SFI	5.78	36.15	41.70	25.69
F-D-WW-(Z)-SFI(Z)	3.53	37.40		
D-WW-SFI	5.43	32.00	44.46	33.64
D(Z)-WW(Z)-SFI(Z)	3.45	33.47		