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Potato Varieties for Idaho

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About 80 varieties of potatoes are grown in the United States but only a few of these are grown in Idaho. The Russet Burbank variety, important in all northern potato growing areas, is by far the most important in Idaho, accounting for about 98% of the state's production. However, a number of other varieties are suited to the state's climatic and soil conditions and can be grown successfully. Table 1 lists some of these varieties, their characteristics and principle uses.

In selecting a variety, the grower should consider a number of factors including the market outlets, disease susceptibility or resistance, time of maturity and storability. It is unwise to plant a variety for which there is little or no market, or one that is highly susceptible to diseases that cannot be economically controlled or that does not store well.

Varieties

Russet Burbank apparently was selected from the Burbank variety before 1912. It is late maturing. Plants are large and spreading and bloom sparsely with white blossoms. Tubers are long, cylindrical; skin is russeted. Eyes are shallow, numerous and well distributed. Yields range from 200 to 400 cwt/acre in eastern Idaho and up to 500 cwt/acre in western Idaho with 40 to 80% U.S. No. 1's and a specific gravity range of 1.075 to 1.095. Russet Burbank is a multipurpose variety suitable for fresh market and processing. It is excellent for baking and processing into frozen-fry and dehydrated products. Russet Burbank has long dormancy and stores well without accumulating excessive sugars at 45°F and above. It will store at 45°F for 5 months without sprout inhibition or for 10 to 12 months with sprout inhibition.

Under adverse growing conditions, Russet Burbank potatoes are subject to various malformation problems such as second growth, jelly end and hollow heart. The variety is very susceptible to leafroll net necrosis and is moderately resistant to moderately susceptible to most other common potato diseases.

Butte is a recent release (1977) from the University of Idaho-USDA Cooperative Potato Breeding Program at the Aberdeen Research & Extension Center. It is 25% Russet Burbank in parentage. It is late maturing. Plants

are large and spreading and bloom profusely with light red-purple blossoms. Tubers are long, cylindrical and well russeted, nearly identical to Russet Burbank. Eyes are shallow, numerous and well distributed. Yields run up to 10% higher than Russet Burbank, U.S.No.1's up to 30% higher. Specific gravity averages slightly higher.

Butte is a multi-purpose variety suitable for fresh market and processing. It is excellent for baking and processing into frozen-fry and dehydrated products, provided that the specific gravity is 1.080 or higher. Processed products have longer shelf life than those made from Russet Burbank. Butte has shorter dormancy than Russet Burbank and will begin sprouting after 3 months storage at 45°F. Longer storage at this temperature requires sprout inhibition. Lower storage temperatures are not recommended for market stock because sugar accumulation is even greater than in the Russet Burbank. Seed stock should be stored at 38 to 40°F.

Butte potatoes are not as susceptible to severe malformation problems under adverse conditions as the Russet Burbank. Jelly end and hollow heart are not problems. Butte needs a long growing season with good fertility or it will not size well. This is a particular problem in the cool, short-season seed areas. Butte has a higher minimum soil moisture requirement than Russet Burbank.

Butte is resistant to leafroll net necrosis and virus X. Recent observations suggest that Butte is more susceptible to blackleg than the Russet Burbank. Butte is less tolerant to verticillium wilt when subjected to moisture or low nitrogen stress. Other disease reactions are similar to those of Russet Burbank.

Butte potatoes have greater nutritional value than Russet Burbank with 25% more protein and 50% more vitamin C. Butte can be recommended as a main crop variety in most commercial Russet Burbank areas, especially in locations where jelly end, hollow heart or net necrosis are chronic problems. Care must be taken to fertilize and irrigate adequately, and long-term storage should include sprout inhibition.

Centennial Russet is a 1976 release from Colorado. It is medium late in maturity. Plants are somewhat

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Table 1. Characteristics of potato varieties for Idaho.

Variety	Maturity	Tuber	Principle uses	Possible problems
Butte	Late	Long, smooth, russet, shallow eyes	Fresh market, processing	Short dormancy, sugar accumulation at low temperatures, under-sized tubers
Centennial Russet	Mid-late	Oblong to long, russet, shallow eyes	Fresh market	Scab, sugar accumulation at low temperatures
Kennebec	Mid-late	Oval, white skin, medium to shallow eyes	Chipping, home garden	Prone to higher storage losses if bruised
Nampa	Mid-late	Long, russet, shallow eyes	Processing	Sugar accumulation at low temperatures, poor texture
Nooksack	Late	Oblong, russet, few and shallow eyes	Fresh market, processing	Low yield, blind seedpieces, slow emergence
Norchip	Medium	Round, white skin, shallow eyes	Chipping	Prone to higher storage losses if bruised
Norgold Russet	Early	Oblong, russet, shallow eyes	Fresh market, home garden	Sugar accumulation, low solids, early dying, blackleg, hollow heart
Norland	Very early	Round, red skin, shallow eyes	Fresh market, home garden	Low solids
Pioneer	Early	Oblong, red skin, shallow eyes	Processing	Highly sensitive to metribuzin (Sencor, Lexone)
Red Pontiac	Mid-late	Oblong, red skin, medium eyes	Fresh market, home garden	
Russet Burbank	Late	Long, russet, shallow eyes	Fresh market, processing	Rough tubers, dark ended french fries; leafroll net necrosis
Targhee	Late	Oblong, smooth, heavy russet skin, shallow eyes	Fresh market, processing	Blackspot, sugar accumulation at lower temperatures

smaller and more erect than Russet Burbank. They bloom sparsely with red-purple blossoms. Tubers are oblong to long, very smooth with dark-brown russeting. Eyes are smaller, not numerous, but well distributed. Yields in Idaho and the Pacific Northwest generally have been below Russet Burbank. Percent U.S.No.1's is generally much higher and specific gravity is comparable. Centennial Russet is primarily a fresh market variety. It has long dormancy. Sugar accumulation is a problem at normal storage temperatures.

Centennial Russet is resistant to leafroll net necrosis but is more susceptible to blackleg than Russet Burbank. It is somewhat more susceptible to metribuzin injury than Russet Burbank and only minimum rates should be applied with careful attention to label instruction.

Centennial Russet potatoes in Idaho generally have been small. This variety appears to be better adapted to California spring-summer crop conditions.

Kennebec was released by the USDA Potato Breeding Program at Beltsville in 1948. It is medium-late maturing. Plants are large and spreading. Blossoms are white. Tubers are oval to oblong and skin is smooth, thin and creamy buff, not russeted. Eyes are few and shallow. Main crop yields are generally higher than Russet Burbank with higher percent No.1's and similar specific gravity. Kennebec is primarily a chipping variety. Its shorter dormancy and storage at 50°F to maintain low sugars makes sprout inhibition necessary.

Kennebec potatoes are subject to various growth defects. Rough, over-sized tubers and hollow heart are common problems. Tubers are set close to the surface and greening is also common. Close spacing helps minimize these problems.

Kennebec is resistant to leafroll net necrosis but is more susceptible to blackleg and various storage rots than Russet Burbank.

Nampa was released by the University of Idaho - USDA Cooperative Potato Breeding Program in 1973. It is medium-late maturing. Plants are medium; blossoms are light red-purple. Tubers are smooth and long with medium russeting and shallow eyes. Yields are equal to or somewhat less than Russet Burbank. Percent U.S. No. 1's is generally higher.

Nampa has outperformed Russet Burbank only in the warmer growing areas of Western Idaho and is apparently tolerant to high daytime temperatures. Growth defects are less of a problem than in Russet Burbank. Specific gravity is normally higher. Its dormancy is shorter than Russet Burbank. Storage below 45°F results in more sugar accumulation than in Russet Burbank. Nampa is a multipurpose variety suitable for processing or fresh market.

Nampa is more susceptible to **Verticillium** wilt than Russet Burbank. It is highly resistant to virus X and moderately resistant to leafroll net necrosis. Inferior cooked texture and seedpiece decay have been major problems with this variety.

Nooksack was released in 1973 by the Washington State University-USDA Cooperative Potato Breeding Program. It is late maturing. Plants are medium large with thick upright stems and very large leaves. Blossoms are white. Tubers are smooth, oblong and russeted. Eyes are shallow and very few in number. Yields are less than Russet Burbank with low tuber set common. Percent U.S.No.1's is considerably higher and specific gravity also is higher. Nooksack is a multipurpose variety suitable for fresh market or frozen-fry processing. It has very long dormancy even at 45°F storage. Pre-warming of seed is advised to help break dormancy before planting. Sugar accumulation is less of a problem than with Russet Burbank.

Nooksack's principal problems are late and spotty emergence caused by long dormancy, numerous skips with machine-cut seed because of fewer eyes and a low tuber set that can result in lower yields. Nooksack is resistant to most growth defects and to leafroll net necrosis. It is similar to Russet Burbank reaction to other diseases.

Nooksack is recommended as a fresh pack potato where the lack of yield may be offset by uniform size and high quality, or as a certified seed crop.

Norchip was released by the North Dakota State University Potato Breeding Program in 1968. It is medium in maturity. Plants are medium-large and spreading. Blossoms are white. Tubers are round to oblong and white skinned. Yield is similar to Russet Burbank but percent U.S.No.1's and specific gravity are higher. Norchip is primarily a chipping variety. Its dormancy is shorter than Russet Burbank and storage for chipping at 50°F requires sprout inhibition. Norchip does not accumulate sugars to the same extent as Russet Burbank.

Norchip potatoes are less subject to growth defects than Russet Burbank or Kennebec. Norchip is particularly susceptible to both the foliar and the tuber phases of early blight. Storage losses to **Fusarium** dry rot and tuber blight have been problems.

Norchip can be recommended as a chipping variety for the limited Idaho market.

Norgold Russet was released from the North Dakota State University Potato Breeding Program in 1964. It is early maturing. Plants are medium and fairly compact and bloom moderately with light red-purple blossoms. Tubers are smooth, oblong and russeted. Eyes are shallow and well distributed. Yields are less than Russet Burbank but percent U.S.No.1's is usually higher. Specific gravity, however, is much lower, rarely exceeding 1.080 in the Western U.S. Norgold Russet is primarily a fresh market potato but it has been used in Washington as an early processor. Dormancy is shorter than for Russet Burbank requiring sprout inhibition for storage over 3 months at 45°F. Sugar accumulation is much greater than in Russet Burbank; Norgold should not be stored for the processing market.

Norgold Russet potatoes are not as susceptible to most growth defects as Russet Burbank but hollow heart is often a problem. It is resistant to leafroll net necrosis

but more susceptible than Russet Burbank to **Verticillium** wilt and, especially, blackleg. Other disease reactions are similar.

Due to poor internal quality, especially after storage, Norgold Russet is recommended primarily only as a seed crop in Idaho.

Norland was released from the North Dakota State University Potato Breeding Program in 1958. It is very early maturing. Plants are medium in size and spreading and bloom moderately with a dark red-purple blossom. Tubers are round to oblong and slightly flattened. The skin is red. Yields are lower than Russet Burbank. Percent U.S.No.1's is generally high and specific gravity is low. Norland is suitable as an early fresh market potato and is especially adapted to home garden use. It is excellent for fresh frying, baking and in salads. Since it is not a processing variety, low temperature storage (38°F) can be used for home and seedstocks. There are no particular growth defect problems or disease problems with the Norland. Norland can be recommended as an early home garden variety for Idaho.

Pioneer was released from the Nebraska State University Potato Breeding Program in 1963. It is a medium-early maturing variety. Plants are medium large with somewhat upright and open growth habit. Blossoms are light red-purple. Tubers are smooth, oblong and light red in color. Eyes are shallow and well distributed. Yields are equal to or somewhat higher than Russet Burbank, especially as an early crop. Percent U.S.No.1's is considerably higher. Specific gravity is unusually high for an early maturing variety, but generally slightly less than Russet Burbank harvested late. Pioneer is suitable for fresh market but its best potential in Idaho is as an early frozen-fry or dehydration processing variety. Its dormancy is shorter than Russet Burbank. It stores unusually well for an early variety and can make suitable frozen-fry product after storage at 45°F. Sugar accumulation is slightly greater than Russet Burbank.

Pioneer is not subject to growth defects. However, oversize tubers and poor skin color are often problems. Pioneer is resistant to leafroll net necrosis but is moderately susceptible to scab. It is very susceptible to both foliar and tuber phases of early blight and to one form of **Fusarium** storage rot. It is sensitive to metribuzin injury and the use of this herbicide is not recommended.

Pioneer can be recommended in Idaho as an early maturing variety suitable for the frozen-fry processing market.

Red Pontiac was released jointly by North Dakota and Minnesota as a mutant of Pontiac in 1949. It is medium-late maturing. Plants are medium large; blossoms are light red-purple. Tubers are round to oblong with red skin and deep eyes. Red Pontiac is well suited as a home garden potato in the Pacific Northwest. Yields are, generally, higher than Norland. It is, however, later maturing than the Norland. Specific

Table 2. Relative disease resistance of potato varieties.¹

	Parasitic						Physiological				
	Common scab	Leafroll		Early blight		Verticillium wilt	Black-leg	Virus X	Growth cracks	Hollow heart	Metribuzin ² sensitivity
		net necrosis	Foliage	Tuber							
Butte	R	R	MS	MR	MS	S	HR	MR	R	R	
Centennial Russet	S	R	MS		MS	S	S	S	S	MS	
Kennebec	S	R			MS	S	S	S	S		
Nampa	R	R	MS		MS		HR	MR	MS	R	
Nooksack	HR	R	MR		MR		S	MS	MS		
Norchip	MS	R	HS	HS	MS		S	MS			
Norgold Russet	R	R	S	R	S	S	S	MR	S	R	
Norland	MS	R	MS		S		S			S	
Pioneer	S	R	HS	S	S		S	R	R	HS	
Red Pontiac	S	R	MS				S	MS	S	S	
Russet Burbank	R	HS	MS	MR	MS	MR	S	MS	MS	R	
Targhee	HR	S	MS	MR	MR		HR	S	MS	R	

¹ HR - Highly Resistant, R - Resistant, MR - Moderately Resistant, MS - Moderately Susceptible, S - Susceptible, HS - Highly Susceptible.

² Early maturing, smooth, white-skinned and red-skinned potato varieties generally are sensitive to post-emergence applications of metribuzin.

gravity is low. Red Pontiac is very susceptible to common scab and moderately susceptible to other common potato diseases.

Targhee was released by the University of Idaho-USDA Cooperative Potato Breeding Program in 1973. It is late maturing. Plants are medium large and somewhat more compact than Russet Burbank. Blossoms are light red-purple. Tubers are smooth, oblong and heavily russeted. Eyes are shallow and well distributed. Yields are about equal to or slightly less than Russet Burbank. Percent U.S.No.1's is much higher and specific gravity is about equal. Targhee is a multipurpose variety suitable for fresh market, frozen-fry or dehydration processing. Its dormancy is shorter than Russet Burbank. Targhee can be stored about 4 months at 45°F without sprout inhibition. Lower storage temperatures will result in somewhat higher sugar accumulation than in Russet Burbank.

Targhee potatoes are subject to growth cracks or elephant hide under adverse growing conditions. Air check and blackspot also have been problems. Targhee is not subject to second growth, hollow heart and jelly end. Targhee is susceptible to leafroll net necrosis, but is

resistant to **Verticillium wilt** and highly resistant to common scab and virus X.

Targhee can be recommended as a main crop variety for most commercial Russet Burbank areas, but it is especially valuable for locations where jelly end, hollow heart or scab are chronic problems.

Disease

Potatoes are subject to a number of different diseases but varieties vary in degree of susceptibility. Planting a resistant variety is an excellent way to help control disease.

The relative reactions of varieties to some of the major potato diseases encountered in Idaho are shown in Table 2 and may be useful when selecting varieties to be grown. All the varieties listed are susceptible to potato virus Y (rugose mosaic), potato leafroll virus, **Rhizoctonia** stem canker, **Fusarium** storage rots, bacterial soft rot (**Erwinia** spp.), and ring rot. University of Idaho Current Information Series Nos. 239, 334, 381 and 386 provide additional information on **Verticillium** wilt, **Rhizoctonia**, early blight and common potato scab and their control.

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