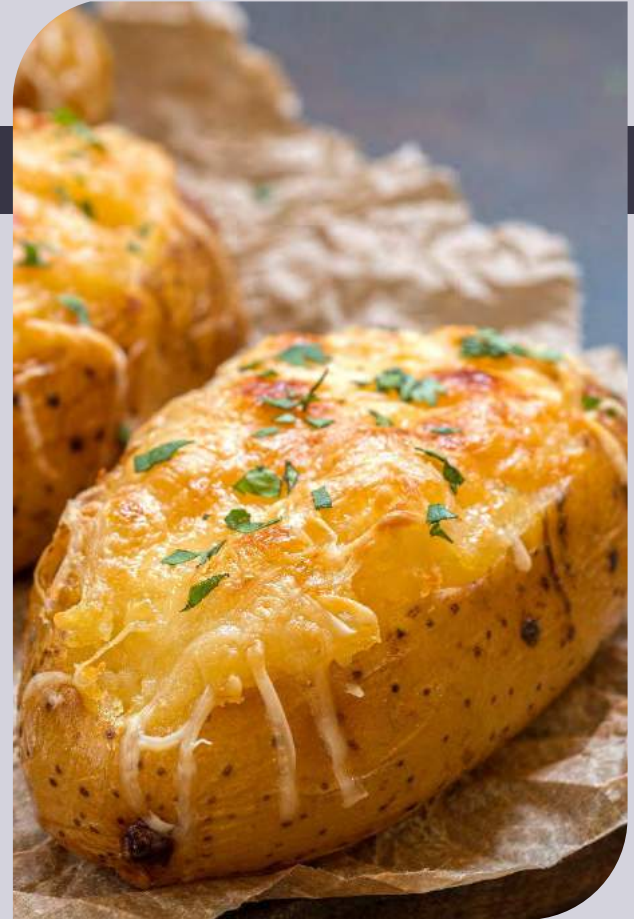


Russet Potatoes

An illuminating presentation on
North America's most widely
grown potato



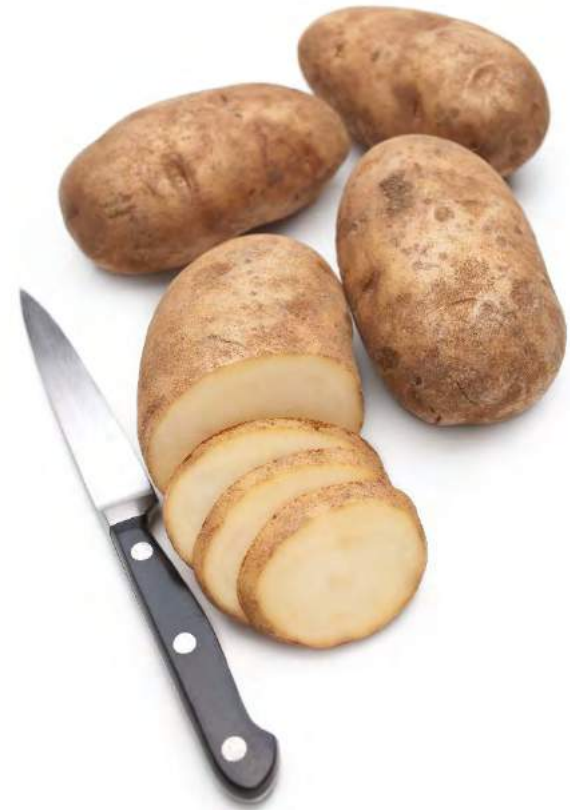
What is a “Russet Potato”



The Russet Potato Profile

The Russet potato gets its name from its russet-brown skin.

- Size: medium (5-9 oz.) to large (10-16 oz.)
- Shape: oblong or slightly flattened and oval
- Skin: light to medium russet-brown, netted
- Flesh: white to pale yellow
- Texture: floury, dry, light and fluffy
- Hearty, flavorful skin
- Mild, earthy flavor
- Medium sugar content



Top Russet Potato Varieties Grown in North America

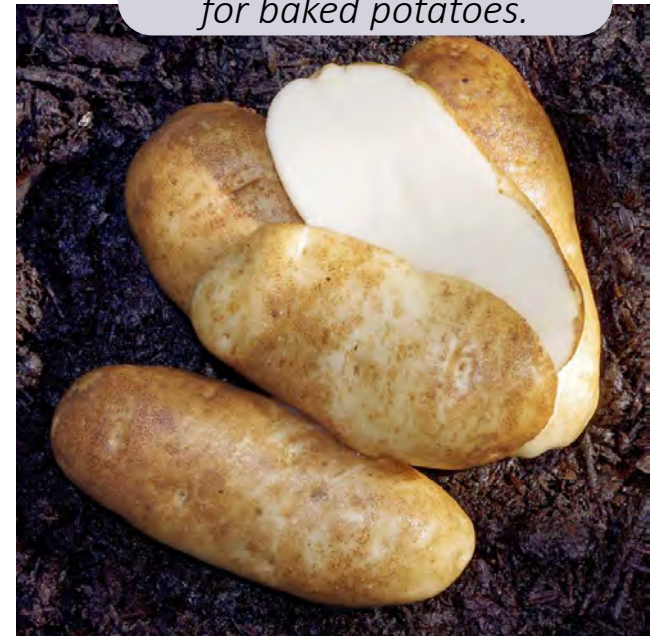
Source: National Potato Council 2018 Potato Statistical Yearbook, June 2018



1. Russet Burbank

- Large, long and cylindrical or slightly flattened
- Dark brown, russeted skin; white flesh
- Dry taste, mealy texture
- Good for baking and frying recipes such as French fries
- Grown in all major potato producing states; Alberta, Manitoba, Prince Edward Island, New Brunswick
Canada

*Russet Burbank:
Bakes light and fluffy
making it the standard
for baked potatoes.*



2. Russet Norkotah

- Long to oblong, well-shaped
- Medium brown smooth, russeted skin; white flesh
- Good for baking or boiling recipes such as mashed potatoes
- Grown in all major potato producing states; Alberta, Quebec Canada

*Russet Norkotah:
Very attractive general
appearance with a high
percentage of U.S. No. 1s.*



3. Canela Russet

- Attractive oblong-long shape
- Russet skin, bright white flesh
- Good for baking and boiling
- Grown in Colorado

*Canela Russet:
Beautiful skin for a picture
perfect baked potato.*



4. Goldrush

- Smooth russeted, oblong-blocky to long, variable shape
- Under some conditions may have a reddish blush
- White to golden flesh
- Good for home and foodservice consumption
- Best for baking and boiling
- An early variety, only stores for a short amount of time
- Grown in Wisconsin, North Dakota; Quebec, Prince Edward Island, New Brunswick, Canada

Goldrush: This excellent flavored potato maintains its color even after cooking.



5. Silvertown Russet

- Medium, oblong; very uniform
- Golden brown russet skin with fine net; white flesh
- Texture is between waxy and floury
- Good for baking and boiling
- Grown in Wisconsin, North Dakota

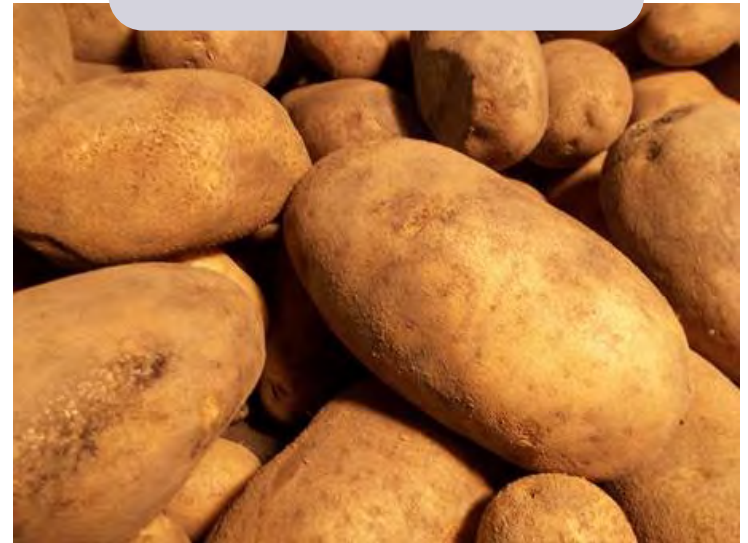
Silvertown Russet: A long potato with white flesh; great for baking.



6. Dakota Russet

- Long-oblong shape
- Attractive, light golden flaky skin
- Creamy white flesh
- Good for frying
- Grown in Nebraska, Minnesota, Montana; Prince Edward Island, Canada

Dakota Russet: Great for fresh-cut fries.



Top 10 Potato Producing States in the U.S. & Canadian Provinces (2017)

Top 10 Potato Producing U.S. States & Canadian Provinces (2017)

Idaho

- 134.85 (million cwt.)
- 13,485,000,000 lbs. or 337,125 full truck loads
- Yield per acre: 42,000 lbs. of potatoes

Washington

- 99.22 (million cwt.)
- 9,922,000,000 lbs. or 248,050 full truck loads
- Yield per acre: 60,500 lbs. of potatoes

Wisconsin

- 28.48 (million cwt.)
- 2,848,000,000 lbs. or 71,200 full truck loads
- Yield per acre: 43,830 lbs. of potatoes

North Dakota* Majority of russet production used for seed.

- 24.42 (million cwt.)
- 2,442,000,000 lbs. or 61,050 full truck loads
- Yield per acre: 32,833 lbs. of potatoes

Prince Edward Island, Canada

- 24.15 (million cwt.)
- 2,415,000,000 lbs. or 60,375 full truck loads

Top 10 Potato Producing U.S. States & Canadian Provinces (2017)

Manitoba, Canada

- 22.20 (million cwt.)
- 2,220,000,000 lbs. or 55,500 truck loads

Oregon

- 21.40 (million cwt.)
- 2,140,000,000 lbs. or 53,500 truck loads
- Yield per acre: 56,666 lbs. of potatoes

Colorado

- 21.22 (million cwt.)
- 2,122,000,000 lbs. or 53,050 truck loads

Alberta, Canada

- 20.5 (million cwt.)
- 2,050,000,000 lbs. or 51,205 truck loads

Minnesota

- 18.43 (million cwt.)
- 1,843,000,000 lbs. or 46,075 truck loads

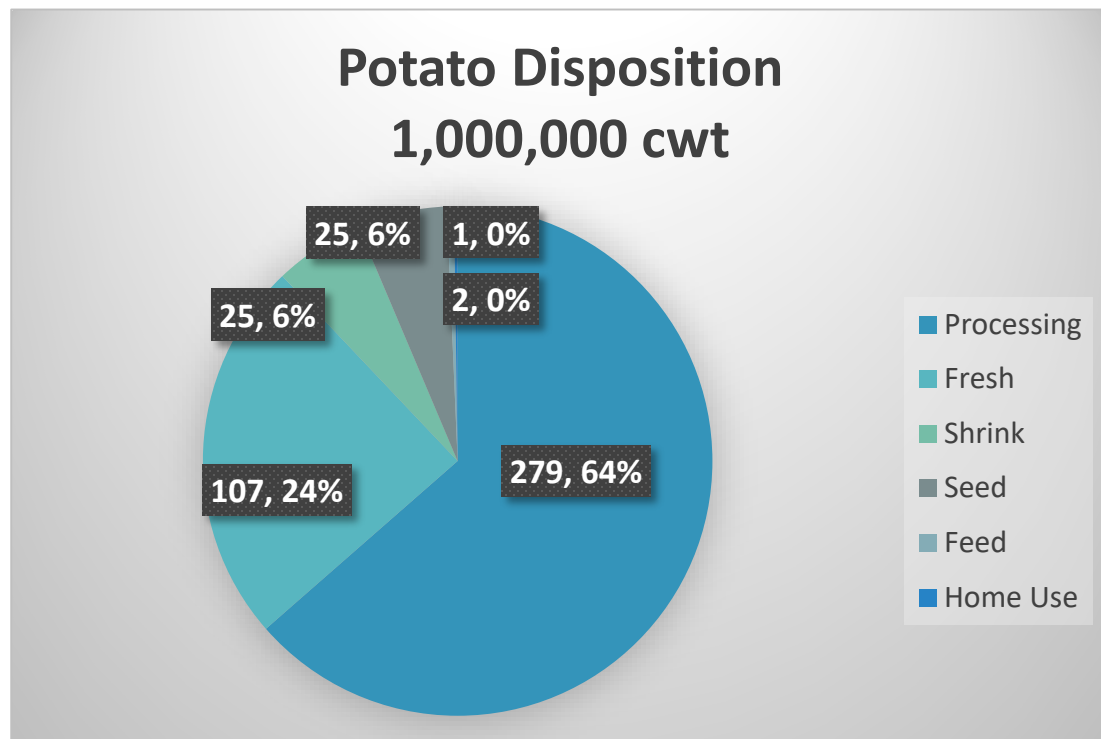
Russet Yield-Per-Acre

- Crop yield per acre refers to the output or measure of a crop per unit, or acre, of land cultivation
- Potato yields vary across the United States due to changes in climate and soil type and variety of russet potato grown
- Example: Washington yields are far greater due to longer growing season and more controlled weather patterns



Usage of U.S. Annual Potato Crop

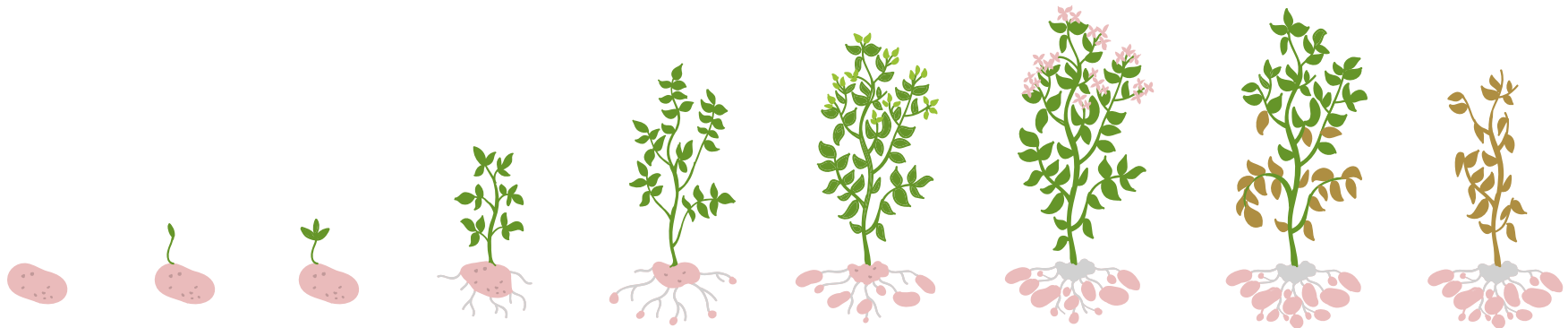
- A majority of russets grown annually are used for processing; this includes:
 - Frozen French fries
 - Hash browns
 - Potato salad
- A large portion of the remaining crop is sold fresh for table potatoes
 - Packed and sold to retail customers



Life of Potato



Potato Growth Stages



Sprout

Development

Sprouts develop from eyes on seed tubers and grow upward to emerge from the soil. Roots begin to develop at the base of emerging sprouts.

Vegetative Growth

Leaves and branch stems develop from above ground nodes along emerged sprouts. Roots and stolons develop at below ground nodes. Photosynthesis begins.

Tuber Initiation

Tubers form at stolon tips but are not yet appreciably enlarging. In most cultivars the end of this stage coincides with early flowering.

Tuber Bulking

Tuber cells expand with the accumulation of water nutrients and carbohydrates. Tubers become the dominant site for deposition of carbohydrates and mobile inorganic nutrients.

Maturation

Vines turn yellow and lose leaves, photosynthesis decreases, tuber growth slows, and vines eventually die. Tuber dry matter content reaches a maximum, and tuber skins set.

Seed: Where do russet potato seeds come from?

- Production farms purchase seed from privately owned or state owned seed farms
- Each state has its own seed certification program
 - These programs ensure seed is free of major diseases such as Potato Virus Y, Blight, Black dot, etc.
- Seed bought by production farms is usually in it's third generation from mini tubers
 - Mini tubers are grown in green houses
 - Seed is multiplied during each generation. Most seed farms focus on one generation, either mini tubers, G1, G2 or G3
 - As the generation increases the chance for disease and non-desired characteristics increases
- Main seed growing areas are in the northern states:
 - Antigo, Wis.
 - North Dakota
 - Montana



What does RPE do?

- RPE, via parent company Wysocki Family of Companies, owns Eagle River Seed Farm (ERSF)
 - ERSF is an early generation seed farm, taking mini tubers and growing generation one and two on the farm
 - This ownership gives us greater control of clean seed into our production farm
- Our agronomy teams visit most seed farms during the growing season to help ensure we have the best seed possible and to get ahead of issues if there are any

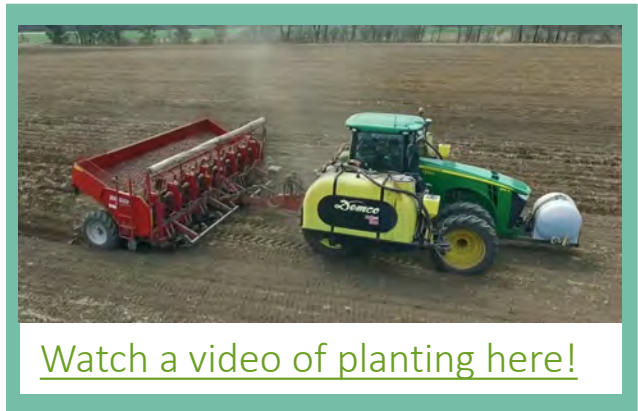


Planting Season

- Potato seed is planted both cut and whole
 - Cut vs. whole seed has different growing characteristics
- Potato planting is highly dependent on soil condition:
 - Needs to be dry
 - Around 40 degrees soil temp
 - Soil preparation has to be done
- Ideally planting season lasts 2-3 weeks
- Seed is planted 8"-13" apart in hills or beds, about 8" below surface
- Typically nutrients, seed and seed protection are all put down at the same time

Planting season varies by region:

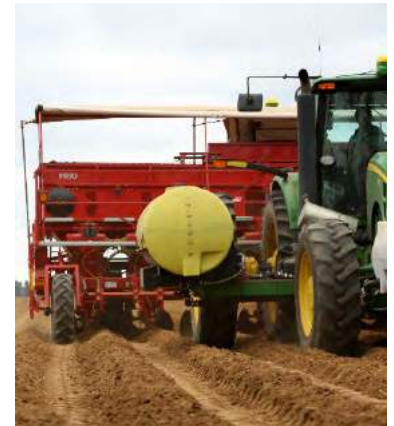
- Wisconsin - April 15th
- Idaho - March 25th
- Washington - March 15th
- Colorado - May 1st
- Minnesota - May 1st
- Michigan - April 15th
- Maine - May 5th
- Florida - Jan 25th
- Texas and California - Feb 15th
- Georgia and Carolinas - March 15th



[Watch a video of planting here!](#)

Wysocki Family of Companies Planting

- WFC plants 24/7 for about 14 days
- We have six eight-row planters and one bed planter
- We use precision agriculture technology to control seed, nutrient, and seed protection placement and rate
- Strict sanitation guidelines for our planting operations
 - Sanitize between fields and seed lots



Growing

- During the growing season crops are monitored daily for
 - Water
 - Irrigation or dry land
 - Nutrients
 - Tissue testing, visual cues, NDVI
 - If any plants show deficiency or stress, we react as quick as possible with additional nutrient through irrigation or side dress
 - Disease
 - Weekly scouting and treatment if needed
 - Development
 - Plant and tuber
- Weather plays a substantial role in the quality, size, and yield potential



Summer (Growing) Season

- Nutrient Monitoring and Upkeep of Nutrient Levels
 - Tissue testing shows the needs of the plants and we then apply if there are any deficiency
 - Fertigation, spray rig, hilling



Harvest

- Once size, quality and yield targets have been achieved, vines are desiccated
 - This is so the skin of the potato can set, typically ~3 weeks
- Harvest-time period varies by growing region and intended market; starts 90-120 days after planting; typically lasts 4-8 weeks
- Potato harvesters are custom designed and come in self-propelled and pull-behind versions
- Dirt, rock, vine, and foreign materials are all mechanically sorted out in the field
- Initial quality sort as potatoes are put into storage; second dirt, rock, and vine elimination
- Potatoes are harvested ideally between 45 and 62 degrees F to ensure product quality and storability
- Fields need to be of the proper moisture to maintain quality



[Watch a video of harvesting here!](#)

Fall (Harvest) Season

- WFC has eight harvesters and we run as many hours as mother nature allows, typically early mornings in the first part of the year and late nights as the temperatures get cooler
- WFC adds over 100 temporary staff to get the job done
- WFC harvests approx. 500 million pounds of potatoes between Aug 1st and October 15th
- Rain and temperature can cause delays in harvest, putting the crop at risk for frost



[Watch a video of night-time harvesting here!](#)

Storage

- Depending on area and variety, russets are stored up to nine-months long
- Large, insulated climate controlled buildings
- High humidity, 99%
- Temps in the low 40s,
- As storage time lengthen, quality typically decreases



Storage Season

- Potatoes moved from building to production facilities either by truck or fluming (use water and a series of tunnels to move potatoes)
- All bins monitored through computer panels allowing remote monitoring and adjusting
- Bin management panels adjust for temperature and air levels
- WFC has eight storage locations and will store potatoes from October to July



[Watch a video of potatoes going through a sort and into storage here!](#)

Packing

- Washed with brushes and clean water to remove dirt
- Undersize is taken out and used for process
- Grading for quality by mechanical or by manual means
 - Sorted into by product, #1 and #2
- Sized for all major consumer and food service products
 - All sizes exist in the field production so all sizes are produced simultaneously
- Final quality grading directly ahead of automated bagging machines



Paragons Potato Farm's Packaging Process

- Potatoes are sized by diameter into:
 - Non A (25% min. of 6 oz. or 1.78" diameter)
 - A Size (40% min. of 6 oz. or 1.78" diameter)
 - 5-9 oz.
 - 10-12 oz. } Often referred to as "Restaurant Size"
 - 12+ oz.
- Typically Non A, A Size and 5-9 oz. are put in consumer pack bags
- Quality assurance team takes samples and measures performance of packaging equipment to ensure only high-quality product gets packed



Russet Pack Sizes Available

- We pack bags in:
 - 5-, 8-, 10-, 15-, 20-pound bags
 - Bags are typically then put into a “bale” to get to approx. 50 lbs. total
- We pack 50 lb. boxes and 50 lb. bags
 - Usually food service customers or re-packers

5 lb. bag size



- Most common potato size packed nationwide in this bag
- Non A: 18-21 average count
- A Size: 15-17 average count
- Some retailers will request slightly larger potatoes
- 5-9 oz.: 9-12 average count

10 lb. bag size



- Used primarily during holidays with most retailers
- Less common because of smaller family trends

Idaho Russets



- 5, 8, 10, 15 lb. bag size
- The “Grown in Idaho” seal can only appear on bags of potatoes that are grown in Idaho

8, 10, 15, 20 lb. bag size



- 10 oz. potato sizing
- Club stores
- Retail premium bag (Bakers in a bag)
- 8 lb. average: 9-13 count
- 10 lb. average: 14-16 count
- 15 lb. average: 22-26 count
- 20 lb. average: 30-24 count

Unclassified Potatoes



- 5, 8, 10, 15, 20 lb.
- Odd shapes and sizes

Shipping and Storage

- Climate controlled trucks or train cars
 - 45-55 degrees F
- Light-controlled environment



Common Potato Defects

These would typically be caught and graded out



Hollow Heart

- Caused by too rapid or irregular growth
- Brown discoloration indicates dead cells caused by plant stress



Growth Crack

- Potato splits while still growing
- Related to fluctuations in soil moisture



Decay

- Caused by a common soil bacteria
- First appears as small, water-soaked spots
- Spots rapidly enlarge, tissue decomposes

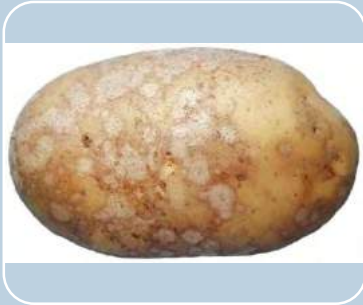


Pressure Bruise

- Develops in storage, causing a flattened or depressed area
- Result of water loss

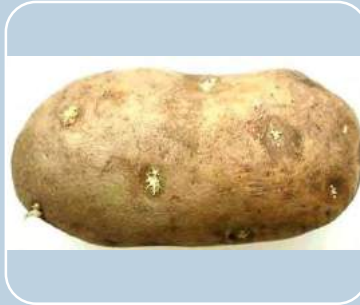
Common Potato Defects

These occur over time and may be present at store-level



Silver Scurf

- Caused by a common potato disease
- Produces a surface blemish causing potatoes to look “dirty”



Sprouting

- Sprouting occurs when potatoes are stored in a moist and/or warm location
- The sprout is the potato starting to grow a new plant



Greening

- Greening is the result of exposure to light
- Consumers should remove any green skin or flesh before cooking and consuming



Skinning

- Skinning is superficial damage involving a partial loss of skin on the surface

Storage Tips at Store Level

- Potatoes are living foods – they continue the metabolic process after harvest, making proper handling and storage critical to quality.
- With proper care, potatoes have an on-shelf life of 21 days
- Temperature: Proper temp is 45 degrees to 50 degrees
- Humidity: Maintain relative humidity around 95% and maintain proper ventilation
- Light: Turn off storage lights and minimize exposure to all other lighting
- Sanitation: Clean and sanitize all potato-handling equipment
- Handling: Avoid dropping or bruising potatoes – a fall of even a few inches causing bruising



Russet Potatoes Packed & Shipped

Buyers should be aware, russet potatoes are packed & shipped two different ways:

Fresh Pack

- Potatoes are dug and packed immediately off the field
- Some growers don't have ability to store potatoes, once they dig need to grade and pack
- 21-30 days after potatoes are dug potatoes can go through a period called "sweat"
- When product is packed off the field, the skin or netting is normally thinner and can cause feathering
- When this dries the potato is trying to heal itself and will be brown in color
- There is a lot of moisture in potatoes when first dug, typical for packers to use poly/mesh or vented bags to help get rid of moisture



Potato with feathering or skinning



Poly/Mesh Vented Bag

Russet Potatoes Packed & Shipped

Buyers should be aware, russet potatoes are packed & shipped two different ways:

Out of Storage

- Potatoes are put into bins on floor and then not graded until have gone through “sweat”
- Less moisture and skin set much better than off field
- Can hold these potatoes 10-11+months depending on size and quality of storage facility
- Farmer also has choice of choosing which bins of potato would like to grade first, poorest quality or size of potatoes in bin generally main two factors
- Balers are typically ALL poly coming out of storage



A nice skin set makes for a wonderful baked potato!



All Poly Bag

Thank you



8550 Central Sands Rd., Bancroft, WI 54921 | RPEProduce.com | 800-678-2789