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# Cultural management of Ranger Russet potatoes

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Ranger Russet was released in 1991 by the USDA Agricultural Research Service and the agricultural experiment stations of Idaho, Oregon, Washington, and Colorado. It is a medium- to late-maturing, long russet variety with excellent processing quality. This publication provides management tips for the successful production of high-quality Ranger Russet potatoes in southern Idaho. Growers should adapt this information to their own situations as experience dictates.

## Seed management

Follow sound seed storage and handling practices (see PNW 248, *Potatoes: Influencing Seed Tuber Behavior*). Ranger Russet seed tends to age physiologically more rapidly than Russet Burbank seed. To retard the aging process, seed growers should store seed at 36° to 38°F and hold the temperature down for as long as possible into the spring.

Seed buyers should avoid seed with sprouts long enough to break off during handling. Planting extensively sprouted seed of Ranger Russet will occasionally result in severe stand reduction. This occurs when a physiological condition causes seed pieces to produce small tubers instead of stems. Optimum seed size is 2 to 2.5 ounces. Ranger Russet is similar to Russet Burbank in its response to *Fusarium*. Use a seed treatment that will help control seed piece decay caused by *Fusarium*.

## Seed spacing

Ranger Russet sets relatively few tubers and has a tendency to produce an excess of oversized tubers. It will benefit from a closer seed-drop spacing than is normal for Russet Burbank, especially in the growing areas that traditionally produce high yields (Table 1).

Table 1. Within-row seed-piece spacing and seed per acre for Ranger Russet potatoes.

Market class	Seed spacing <sup>1</sup>	Seed per acre <sup>2</sup>
	(inches)	(cwt)
Seed	6 to 7	31 to 36
Frozen, processed, or fresh	8 to 10	22 to 27

<sup>1</sup>Recommendation based on a 36-inch row width.

<sup>2</sup>Based on a 2-ounce average seed-piece size.

## Fertility

No research information is available concerning Ranger Russet's phosphorus, potassium, or micronutrient requirements. Follow recommendations developed for Russet Burbank potatoes (see CIS 261, *Idaho Fertilizer Guide: Potatoes*).

Required amounts of nitrogen (N) and methods of application are similar to those for Russet Burbank. Crop need is based on potential yield.

Nitrogen can be applied all preplant or seasonally, depending on grower preference and growing area. In areas with long growing seasons or sandy soils, Ranger Russet will benefit from seasonal N applications based on petiole testing as an indicator of crop need. When feasible, use seasonal applications of N to increase N efficiency.

Avoid applying excess N, especially late in the season. Excessive N may delay maturity enough to cause storage problems.

**N application all preplant** — If all fertilizer is to be applied preplant, obtain a soil test to determine residual N. Then, use Table 2 to determine the amount of N to apply. Use Table 3 to predict potential yield until experience provides better estimates. A historical average yield for Russet Burbank can be used as

3  
322  
919

**Table 2. Total nitrogen fertilizer requirement for Ranger Russet based on soil testing and potential yield. (All N applied preplant.)**

Soil test N (ppm N)	N requirement based on potential yield in cwt/acre				
	200	300	400	500	600
0	100	150	200	250	300
10	60	110	160	210	260
20	20	70	120	170	220
30	0	30	80	130	180
40	0	0	40	90	140
50	0	0	0	50	100
60	0	0	0	0	60

Note: Add 15 pound N for each ton of grain straw from the previous crop, up to 50 pounds per acre.

<sup>1</sup>Total ppm of NO<sub>3</sub>-N and NH<sub>4</sub>-N in 0- to 12-inch and 12- to 24-inch samples.

**Table 3. Potential yield of Ranger Russet in southern Idaho.**

Growing area	Potential yield <sup>1</sup> (cwt/acre)
East <sup>2</sup>	300 to 400
Central	400 to 500
West	500 to 600

<sup>1</sup>Due to the variability of conditions within each growing area, a range of potential yields is given. If yields in your locale are traditionally lower or higher than yields in most other locales within the area, determine your potential yield from the corresponding end of the range.

<sup>2</sup>East includes all of the upper Snake River Plain south and west to American Falls and all high-altitude seed areas.

an estimate of Ranger Russet's potential yield because the two varieties produce similar yields in most environments.

**Seasonal N application** — Obtain a soil test and use Table 4 to determine the amount of preplant N to apply. Monitor petiole nitrate levels throughout the season. See Table 5 for a list of the optimal petiole nitrate levels for each growth stage.

**Table 4. Preplant nitrogen fertilizer application rate for Ranger Russet assuming seasonal applications.**

Preplant soil NO <sub>3</sub> -N (0 to 12 inches) (ppm)	Application rate <sup>1</sup>		
	SE	SC	SW
0	90	105	120
5	60	75	90
10	30	45	60
15	0	15	30
20	0	0	0

<sup>1</sup>SE, southeastern Idaho; SC, southcentral Idaho; SW, southwestern Idaho.

Ranger Russet's seasonal petiole nitrate profile differs slightly from Russet Burbank's. Consequently, critical levels of petiole nitrate at any given time during crop growth will also differ.

Under identical soil N conditions, Ranger Russet's petiole nitrate levels are 2,000 to 4,000 ppm higher than those of Russet Burbank. Given that Ranger Rus-

**Table 5. Minimum petiole NO<sub>3</sub>-N level for Ranger Russet during different growth stages.**

Growth stage	Description	Minimum petiole N <sup>1</sup> (ppm)
I	Planting until tuberization	20,000
II	Tuberization	18,000
III	Tuber bulking	18,000
IV	Maturation (yellowing, leaf loss)	13,000

<sup>1</sup>See CIS 743, *Tissue Analysis — A Guide to Nitrogen Fertilization for Russet Burbank Potatoes*, for petiole sampling techniques.

set's N requirement appears to be similar to Russet Burbank's, its critical petiole nitrate levels will also be 2,000 to 4,000 ppm higher during any given growth stage.

## Irrigation

Ranger Russet and Russet Burbank use similar amounts of water with the exception that Ranger Russet's rapid early growth may result in its using more water than Russet Burbank early in the season. Maintain available soil moisture above 65 percent throughout most of the season. Low soil moisture early in the season will result in excessively long and misshapen tubers. Late-season irrigation management is important because the variety is susceptible to tuber dehydration. Avoid water stress as long as the plants are green to reduce blackspot bruise and storage problems that may result from harvesting dehydrated potatoes. Preharvest irrigation should also help prevent harvest injury.

## Weed control

Ranger Russet is tolerant of metribuzin (Sencor/Lexone) applied at labelled rates (see CIS 291, *Metribuzin for Weed Control in Potatoes*). No injury has been observed as a result of any other herbicides that are currently registered for use on potatoes. Ranger Russet produces a relatively large vine and will successfully compete with most mid- to late-season weeds.

## Diseases

Ranger Russet is immune to PVX and highly resistant to PVY infection. This should increase seed growers' ability to produce quality seed.

Use certified seed to reduce problems with other virus diseases, bacterial ring rot, and blackleg. Ranger Russet may occasionally require fungicidal treatments for early blight. Ranger Russet and Russet Burbank have similar susceptibilities to storage diseases. To avoid problems in storage, mature tubers properly and avoid excessive bruising. Ranger Russet is moderately susceptible to common scab. It should not be planted in fields with a history of this problem.

Ranger Russet is very susceptible to root-knot nematodes and corky ringspot. Avoid or treat fields with a history of nematodes.

## Vine kill and harvest

Monitor tuber size and kill the vines before excess oversized tubers develop. Otherwise, kill vines approximately 21 days before the intended harvest date to allow time for tuber maturation.

Ranger Russet is more susceptible to blackspot than is Russet Burbank. It is essential to employ all proven bruise-prevention practices during harvesting and handling operations. Low soil moisture levels late in the growing season or at harvest dramatically increase the incidence of blackspot.

## Storage

Ranger Russet has a shorter dormancy period than Russet Burbank, approximately 100 days at 45°F. This means that potatoes stored for seed will need to be kept as cold as possible (about 36° to 38°F) to prevent excessive aging and sprouting.

For potatoes held for processing, use storage temperatures and conditions recommended for Russet Burbank (see PNW 257, *Potatoes — Storage and Quality Maintenance in the Pacific Northwest*, and CIS 297, *Potato Storage — Construction and Management*). Potatoes held for processing longer than 3 months will need chemical sprout inhibition before the end of the third month.

Store only well-matured, healthy potatoes that are relatively free of handling injury. Fusarium dry rot can be a problem in storage if the tubers are immature or damaged.

## Management summary

**Seed** — Optimal cut-seed size is 2 to 2.5 ounces. Avoid excessively sprouted or aged seed. Seed-piece spacing should be 8 to 10 inches for commercial crops and 6 to 7 inches for seed crops.

**Fertility** — Use fertilizer application rates and practices similar to those for Russet Burbank. Critical petiole nitrate levels for Ranger Russet are 2,000 to 4,000 ppm higher than those for Russet Burbank.

**Irrigation** — Ensure adequate moisture both early and late in the season. Total water use by Ranger Russet is similar to that by Russet Burbank.

**Diseases** — Do not plant Ranger Russet in fields with root-knot nematodes or a history of common scab unless the field is properly treated. To minimize

storage rots, take extra care to mature tubers properly and to avoid bruise damage.

**Vine kill and harvest** — Monitor tubers and kill vines when they reach optimal size but at least 18 to 21 days before harvest. During harvest, use the best bruise-prevention practices available.

**Storage** — For seed, hold tubers at 36° to 38°F for as long as feasible. For processing potatoes, use storage conditions recommended for Russet Burbank and apply sprout inhibitor before the end of the third month.

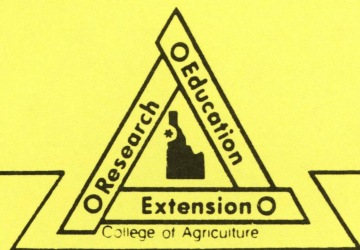
## Further information

- CIS 261 *Idaho Fertilizer Guide: Potatoes*, 35 cents
- CIS 291 *Metribuzin for Weed Control in Potatoes*, 35 cents
- CIS 297 *Potato Storage — Construction and Management*, 25 cents
- CIS 743 *Tissue Analysis — A Guide to Nitrogen Fertilization for Russet Burbank Potatoes*, 35 cents
- PNW 248 *Potatoes: Influencing Seed Tuber Behavior*, 50 cents
- PNW 257 *Potatoes — Storage and Quality Maintenance for the Pacific Northwest*, 75 cents

A series of three videos, *Potato Bruise Prevention*, may also be available through the Extension agricultural agent in your county.

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