

# 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 producing 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*, and CIS 1031, *Potato Seed Management: Seed Size and Age*). Physiological aging tends to occur more rapidly in Ranger Russet than in Russet Burbank. To retard the aging process, seed growers should store seed at 36° to 38°F and hold these temperatures 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, resulting 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 piece 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.

**Table 2. Preplant phosphorus (P) fertilizer recommendations for Ranger Russet potatoes, based on recommendations developed for Russet Burbank.**

Soil test P (0 to 12 inches)	Percent free lime			
	0	4	8	12
(ppm)	----- (lb P <sub>2</sub> O <sub>5</sub> /acre) -----			
0	320	360	400	440
5	240	280	320	360
10	160	200	240	280
15	80	120	160	200
20	0	40	80	120
25	0	0	0	40
30	0	0	0	0

Apply an additional 40 to 80 pounds of P<sub>2</sub>O<sub>5</sub>/acre as a starter at planting for soil test P levels below 30 ppm.

Add 25 pounds P<sub>2</sub>O<sub>5</sub>/acre for each additional 100 cwt/acre above 400 cwt/acre.

Petiole phosphorus concentrations should be kept above 0.22 percent through tuber bulking.

## Fertility

No research information is available concerning Ranger Russet's phosphorus, potassium, or micronutrient requirements. Follow recommendations developed for Russet Burbank potatoes. See Tables 2 and 3 for recommended application rates based on soil tests.

Required amounts of nitrogen (N) and methods of application are similar to those for Russet Burbank.



**Table 3. Potassium (K) fertilizer recommendations for Ranger Russet potatoes, based on recommendations developed for Russet Burbank.**

Soil test K (0 to 12 inches)	Yield goal (cwt/acre)			
	300	400	500	600
(ppm)	----- (lb K <sub>2</sub> O/acre) -----			
25	550	600	650	700
50	450	500	550	600
75	350	400	450	500
100	250	300	350	400
125	150	200	250	300
150	50	100	150	200
175	0	0	50	100

Petiole potassium concentrations should be kept above 7 percent through tuber bulking.

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 late applications of N (after August 10 in most Idaho growing areas). Excessive N, applied late in the season, may delay maturity sufficiently to cause vine killing and/or 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 4 to determine the amount of N to apply. Use Table 5 to predict potential yield until experience provides better estimates. An historical average yield for Russet Burbank can be used as an estimate of Ranger Russet’s potential yield.

**Seasonal N Application**—Obtain a soil test and use Table 4 to determine the amount of preplant N to apply. To maximize yield and quality, growers should plan to have 40 to 45 percent of the total seasonal N requirement

**Table 4. Total nitrogen (N) fertilizer recommendations for Ranger Russet potatoes. Application rates include preplant and seasonal applications.**

Soil test N <sup>1</sup> (0 to 12 inches)	Yield goal (cwt/acre)			
	300	400	500	600
(ppm)	----- (lb N/acre) -----			
0	230	270	310	350
5	210	250	290	330
10	190	230	270	310
15	170	210	250	290
20	150	190	230	270
25	130	170	210	250
30	110	150	190	230
35	90	130	170	210
40	70	110	150	190

<sup>1</sup>Soil test N = Nitrate-N + Ammonium-N.

Add 15 pounds N/acre for each ton of grain residue up to 60 pounds N/acre.

Subtract 60 pounds N/acre after alfalfa.

**Table 5. 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.

applied before row closure. Monitor petiole nitrate concentrations throughout the season. See Table 6 for optimal petiole nitrate concentrations for each growth stage.

Ranger Russet’s seasonal petiole nitrate profile differs slightly from Russet Burbank’s. Consequently, critical concentrations 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 generally 2,500 to 4,500 parts per million (ppm) higher than those of Russet Burbank (fourth petiole). Given that Ranger Russet’s N requirement appears to be similar to Russet Burbank’s, its critical petiole nitrate concentrations will also be 2,500 to 4,500 ppm higher during any given growth stage.

## Irrigation

Ranger Russet and Russet Burbank use similar amounts of water, however, Ranger Russet displays rapid early growth and may require more water than Russet Burbank early in the season. Maintain available soil moisture above 65 percent throughout the growing season. Low soil moisture early in the season may result in excessively long and misshapen tubers.

Late-season irrigation management is important because Ranger Russet is susceptible to tuber dehydration. Avoid water stress as long as the plants are green to reduce blackspot bruise and storage problems that may

**Table 6. Sufficiency range of petiole NO<sub>3</sub>-N for Ranger Russet during different growth stages.**

Growth stage	Description	Sufficiency range <sup>1</sup> (ppm)
I	Emergence until tuberization	20,000 to 22,000
II	Tuberization	18,000 to 20,000
III	Tuber bulking	18,000 to 20,000
IV	Maturation (yellowing, leaf loss)	13,000 to 15,000

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

result from harvesting dehydrated potatoes. Multiple, light preharvest irrigations during the tuber maturation period should help prevent harvest injury and reduce blackspot bruising.

## 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 and Russet Burbank have similar susceptibilities to storage diseases. To avoid problems in storage, handle mature tubers properly and avoid excessive bruising. Ranger Russet is moderately susceptible to common scab and 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 planting in or treat fields with a history of nematodes. Ranger Russet is resistant to early dying caused by *Verticillium* wilt.

The foliage of Ranger Russet has similar susceptibility to late blight as that of Russet Burbank. Standard recommendations for fungicide applications should be followed. Tubers of Ranger Russet are susceptible to late blight tuber rot and should be carefully monitored in the field and in storage. When late blight is present during the growing season, prepare tubers for harvest and storage as per University of Idaho recommendations.

## 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 and skin set.

Ranger Russet is more susceptible to blackspot bruise than is Russet Burbank. The first step for minimizing bruise in Ranger Russet is to maintain adequate soil moisture during senescence, maturation, and harvest. Maintain soil moisture above 65 percent until vine kill, and above 60 percent during maturation. Frequent, light water applications, rather than a single preharvest application, are recommended between vine kill and harvest if weather conditions are conducive for soil drying.

Two additional steps can be taken to reduce blackspot

bruising. The first is to kill vines before the majority of them are either yellow or dead. Over-mature tubers tend to be more susceptible to blackspot bruise than tubers taken from plants killed green. The last step is to employ all proven bruise prevention practices during harvesting and handling. This includes digging with adequate moisture, keeping all belts and chains fully loaded with potatoes, and adjusting equipment to eliminate bruise points.

## 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 cool (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. Potatoes held for processing longer than 3 months will need a chemical sprout inhibitor applied before the end of the third month.

Store only 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. Maintain high humidity to prevent pressure bruise.

## Management Summary

**Seed**—Optimal seed piece 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 similar fertilizer application rates and practices recommended for Russet Burbank. Critical petiole nitrate levels for Ranger Russet are 2,500 to 4,500 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 of 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 reduce incidence of these pests. To minimize storage rots, take extra care to mature tubers properly and to avoid bruise damage. Monitor stored tubers for tuber late blight and other storage rots.

**Vine Kill and Harvest**—Monitor tuber size and kill vines when optimal but at least 18 to 21 days before harvest. Keep available soil moisture above 60 percent before harvest. During harvest, use the best possible 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 to potatoes stored longer than 3 months.

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