

There's No Recipe for Planting – Only Guidelines

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Occasionally I get the urge to bake brownies. I make them the easy way using a boxed mix. All I need to do is add water, eggs, and vegetable oil, stir and bake. The directions for preparation and baking—including adjustments that need to be made for high-altitude baking, which I must follow—are very specific and clear as to what I need to do to successfully make the brownies.

There are a number of factors—potato variety, environment, soil type, end-use, etc.—that must be considered to accurately determine potato seed piece size, spacing, and planting depth. Unlike the directions on the brownie box, there is not a specific set of instructions that accommodates the multiplicity of factors that need to be considered. However, there are general guidelines that can be followed for most situations.

Seed Tuber Size: Cutting potato seed tubers to the correct seed piece size and profile will generally result in a more uniformly planted crop. Ideally, seed tubers should be 3 to 10 ounces. Seed tubers weighing 1.5 to 3 ounces should be planted as single-drop seed pieces. Cutting seed tubers larger than 10 ounces will likely result in more seed pieces without buds—blind seed pieces—because as seed tuber size increases, the number of buds (eyes) increases only slightly.

Seed Piece Size: For most varieties, 1.5 to 2.5 ounces is a good seed size average. However, some varieties have fewer eyes per tuber so may need to be cut into a slightly larger average seed piece size. Ranger Russet average seed piece size should be 2.0 to 2.5 ounces. For a couple of the newer varieties, Blazer Russet average seed piece size should be 2.0 to 3.0 ounces and Western Russet should have a 2.25 to 2.75 ounce average size. For all varieties, larger seed pieces will generally produce

more yield, but the incremental increase in yield diminishes as the size of seed pieces surpasses the upper level of the recommended average size range.

Seed Piece Profile: As important as it is to cut seed pieces to the recommended average size, for all varieties, a minimum of 70 percent of the seed pieces should fall within the desired size range. Tubers cut to a uniform size will generally plant better than those with a wide size profile.

Seed Piece Spacing: It is impossible to make a general recommendation for the correct seed piece spacing because spacing depends on the end-use of the potatoes, growing season length, and variety. Table 1 shows the optimal seed piece spacing in rows spaced 36 inches for several varieties grown in Idaho.

Table 1. Within-row seed piece spacing several potato varieties grown for commercial production (not seed) in rows spaced 36 inches.

Variety	Spacing (in)
Alturas	13 – 15
Blazer Russet	9 – 11
Russet Burbank	10 – 12
Russet Norkotah	11 – 13
Russet Norkotah CO#3	9 – 11
Russet Norkotah (other selections)	10 – 12
Western Russet	10 – 12

As mentioned above, seed piece spacing is affected by several factors. For Russet Burbank, five years of research in Idaho has shown that wider in-row seed piece spacing resulted in decreases in both total and U.S. No. 1 yields. Additionally, compare the tuber-size category yield results in Table 2 from this same study. Note there was no difference in the U.S. No. 1 yield between the 12- and 16-inch seed piece spacing (224 vs. 207, respectively), and

Table 2. Within-row seed piece spacing effect on tuber size for Russet Burbank potatoes.

Tuber Size Category (oz)	In-row seed piece spacing (in)			
	8-in	12-in	16-in	20-in
	-----cwt/ac ¹ -----			
>16	19 a	31 b	36 bc	36 c
12 - 16	30 a	39 bc	41 c	36 b
10 - 12	26 ab	32 c	28 bc	24 a
8.5 - 10	27 a	26 a	26 a	19 b
6 - 8.5	66 a	54 b	44 c	35 d
4 - 6	67 a	42 b	32 c	23 c
U.S. No. 1	235 a	224 ab	207 b	173 c

¹Numbers followed by the same letter within a tuber size category are not significantly different at P≤.05.

although there were fewer tubers smaller than 8.5 ounces at the 16-inch spacing, there was not a significant increase in the larger size tubers. Consequently, at least for Russet Burbank, increasing the in-row spacing will not increase the yield of larger tubers.

When determining a seed piece spacing suitable for your operation, keep in mind that seed piece spacing should be customized for each field so tubers meet the size specification for the intended market. Also, potatoes grown in sandy soil usually have a higher number of tubers per plant, so the seed piece spacing should likely be farther apart. Lastly, potatoes grown in areas with a long growing season tend to produce larger and more malformed tubers, so the seed pieces should generally be planted at a closer spacing.

Seed Piece Planting Depth: Producers are also often concerned about how seed piece planting depth can be adjusted to minimize field greening of tubers. Research at the University of Idaho Aberdeen

R & E Center has shown that for Russet Burbank, the yield of field green tubers cannot be significantly reduced by planting seed pieces at 9 inches compared with 6 inches when measuring planting depth from the top of the hill to the top of the seed piece. Additionally, total yield was significantly reduced, and there was a trend for U.S. No. 1 yield to be lower when planting at 9 inches compared with 6 inches.

Subsequent hilling studies were conducted with Russet Burbank to determine if a hilling operation would help minimize field-greening of tubers. It was found that, within the ability of commercially available potato production equipment to move soil to the top of a hill, field tuber greening could not be reduced by a hilling operation when performed just as the potato plants were beginning to emerge. From these studies, the best recommendation for minimizing field tuber greening is to plant seed pieces at a depth of 6 inches.

Planting and/or final hilling depth for other varieties grown in Idaho are similar to Russet Burbank: Alturas, 5 – 7 inches; Western Russet, 5 – 6 inches; Blazer Russet, 5 – 6 inches; and Russet Norkotah, approximately 6 inches.

Missing Seed Pieces/Plants: It is highly recommended that producers regularly check the accuracy of their planting operations. Even in the best planting operations, there will be some missing seed pieces. Although variety-dependent, yield generally will not be affected unless the percent missing plants (seed pieces) exceeds 15 percent. Keep in mind, however, that missing seed pieces will have a more pronounced effect on decreasing yield when the seed pieces are planted farther apart within the row. Still, producers should strive to plant as close to 100 percent stand as possible.

Potato producers have only one opportunity to plant a potato crop in any given

year, so it needs to be done correctly the first time. Even though there is not a recipe for planting potatoes like there are directions for baking brownies, these above guidelines do give some clear direction as to what needs to be done to successfully plant a potato crop.

Did You Know?

It took roughly 4.4 billion potato seed pieces to plant the 300,000 acres of potatoes that were planted in Idaho in 2008, and if the seed pieces were each 2 inches wide, laid side by side, would equal nearly 139,000 miles.

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