

# EFFECT OF MISSING PLANTS ON YIELD OF FOUR POTATO VARIETIES

William H. Bohl, Stephen L. Love, and Tom Salaiz

It's likely that the majority of potato producers know the average seed-piece spacing of their planted crop, and many producers take time to determine if the seed pieces are uniformly placed. When determining planting accuracy, it is highly probable some missing seed pieces (planter skips) will be found. The question that then arises is what are the consequences of these planter skips?

## PROCEDURE

To answer this question, an experiment was conducted in 2002 through 2004 at the University of Idaho Aberdeen Research & Extension Center using Russet Burbank, Russet Norkotah, Summit Russet, and GemStar Russet potatoes. Seed pieces were planted at an in-row spacing of either 8 or 16 inches in rows spaced 36 inches. Plots consisted of four rows each 18.7 feet long, and the center two rows were harvested for data collection. Plots were planted in late April to early May and harvested in late September to mid October. Some of the plots were planted with no planter skips (100 percent stand) while others were planted with either 15 percent (85 percent stand) or 30 percent planter skips (70 percent stand). The skips were randomly located throughout the plot to closely mimic what would happen with a commercial potato planter. Two seed-piece spacings were used because our objective was to determine if planter skips affected yield similarly at both wide and close in-row seed-piece spacings.

## RESULTS AND DISCUSSION

The effect of planter skips averaged across varieties is summarized in Table 1. The 100 and 85 percent stands produced nearly identical results for both total and U.S. No. 1 yields. However, both total and U.S. No. 1 yields were significantly decreased at the 70 percent stand. No potato planter can be 100 percent accurate all the time, so based on this research, having a few planter skips will not significantly impact yield.

**Table 1. Effect of percent stand on total and U.S. No. 1 yields. Numbers within a yield category followed by the same letter are not significantly different (P =.05).**

Yield (cwt./a)	100% Stand	85% Stand	70% Stand
Total	349 a	346 a	320 b
U.S. No. 1	252 a	250 a	227 b

However, the four varieties in this study did not respond the same to the treatments imposed (Table 2). At the 8-inch seed piece spacing, planter skips did not have a significant effect on total yield of the four varieties tested. However, at the 16-inch seed-piece spacing, the total yield of Russet Burbank, Russet Norkotah, and GemStar Russet trended downward as percent missing plants increased with the 70 percent stand producing significantly less yield compared with the 100 percent stand, whereas Summit Russet produced a significantly higher yield at the 85 percent stand compared with the other two plant populations.

**Table 2. Effect of seed-piece spacing and percent stand on total yield of four potato varieties. Numbers within a variety within an in-row seed piece spacing with the same letter are not significantly different (P =.05).**

	Russet Burbank	Russet Norkotah	Summit Russet	GemStar Russet
% Stand at 8 inches	-----Cwt. Per Acre-----			
100	393 a	290 a	366a	445 a
85	404 a	318 a	370 a	441 a
70	381 a	278 a	355 a	442 a
% Stand at 16 inches	-----Cwt. Per Acre-----			
100	343 a	264 a	277 b	414 a
85	315 ab	239 ab	306 a	375 ab
70	285 b	213 b	258 b	346 b

U.S. No. 1 yields are shown in Table 3. As was observed for total yield, planter skips at the 8-inch seed piece spacing did not have a significant effect on U.S. No. 1 yield of any variety in the study. At the 16-inch seed piece spacing, Russet Burbank produced significantly lower U.S. No. 1 yield at both the 85 and 70 percent stands compared with the 100 percent stand. There was a trend for the U.S. No. 1 yield of Russet Norkotah to be less as the percent stand decreased from 100 to 70 percent. U.S. No. 1 of GemStar Russet yield trended downward as percent missing plants increased with the 70 percent stand producing significantly less yield compared with the 100 percent stand. Note that the U.S. No. 1 yield response of GemStar Russet to planter skips is the same as for total yield. Summit Russet also responded to seed-piece spacing and planter skips for U.S. No. 1 yield the same as for total yield with the 85 percent stand resulting in a significantly higher U.S. No. 1 yield.

**Table 3. Effect of seed-piece spacing and percent stand on U.S. No. 1 yield of four potato varieties. Numbers within a variety within an in-row seed piece spacing with the same letter are not significantly different (P =.05).**

	Russet Burbank	Russet Norkotah	Summit Russet	GemStar Russet
% Stand at 8 inches	-----Cwt. Per Acre-----			
100	201 a	215 a	302 a	357 a
85	209 a	244 a	307 a	370 a
70	180 a	212 a	298 a	375 a
% Stand at 16 inches	-----Cwt. Per Acre-----			
100	169 a	205 a	223 b	347 a
85	110 b	188 a	259 a	311 ab
70	93 b	167 a	209 b	279 b

### **CONCLUSIONS**

Following are some points to keep in mind from the results obtained in this study:

- Planter skips will have a more pronounced effect on decreasing yield when the seed pieces are planted at a wider in-row spacing.
- Planter skips will cause yield reductions especially when approaching 30 percent (70 percent stand).
- Effect of in-row spacing and/or planter skips is variety specific.

A three-year study that included four potato varieties was conducted at the University of Idaho Aberdeen Research & Extension Center to determine the effect of planter skips on yield when planted at a narrow or wide in-row seed-piece spacing. Planter skips caused both total and U.S. No. 1 yields to decrease. However, it was found that the effect of planter skips on yield was variety specific. Additionally, in this study both total and U.S. No. 1 yields were decreased only when planter skips occurred at the wider in-row spacing.