

Evaluation of Pumpkin Cultivars No-till Direct-seeded and No-till Transplanted into Wheat Stubble, Indiana 2005

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Double-cropping pumpkins after wheat provides an opportunity to harvest a high-value crop off of land that might otherwise remain uncropped. In northern Indiana, many jack-o-lantern pumpkin cultivars may not mature quickly enough to produce a crop when planted in mid-July. This project compared yield and fruit size of five cultivars or lines when they were either direct-seeded or transplanted into wheat stubble.

Materials and Methods. The trial was conducted at the Pinney-Purdue Agricultural Center in Wanatah, Indiana. Wheat was harvested from the experimental area the first week of July, straw was baled and removed, and the area treated with paraquat to kill emerged weeds. Urea was broadcast to supply N at 80 lb./A. The trial was set up as a randomized block design with 3 replications. Treatments were arranged in a split plot design. Planting method, either transplant (TR) or direct-seed (SD), was the main plot. Five cultivars were the subplots. A single subplot was 24 ft. wide with three 24-ft. rows spaced 6 ft. apart in the center of the plot (576 sq. ft.). The trial was bordered by a single row of transplanted guard plots with various additional cultivars. The field was overhead irrigated to improve soil conditions prior to planting. On July 14 two seeds per hill were hand-planted in hills 4 ft. apart in the SD treatment. After emergence, plants were thinned to 6 per row (1361 plants/A). On July 19, 3-week-old seedlings were transplanted 4 ft. apart using a mechanical transplanter designed for no-till planting. Plants were irrigated as needed using drip irrigation. Insects and diseases were controlled using standard practices for the area. Plots were hand-weeded once. Pumpkins were harvested on October 21. At harvest, pumpkins were graded into marketable and cull categories. Marketable fruit were further separated into “orange,” if over 90% of the surface was orange, and “turning,” if the pumpkin had begun to turn orange but less than 90% of the surface was orange. Immature and cull pumpkins were also harvested, but data for them are not shown. Average weight per pumpkin was calculated. Analyses of variance were used to test for significant effects of planting method, cultivar, and their interaction, followed by mean separation using Fisher’s protected LSD at $P = .05$.

Results and Discussion. Transplanted pumpkins established well in the wheat stubble. Establishment of direct-seeded plants appeared variable from row to row. Weed populations were high. Predominant weeds were stinkgrass, lambsquarters and pigweeds. Many lambsquarters survived the preplant burndown. Transplanted cultivars with vigorous vines suppressed weed growth in the plots, but the wide rows between the plots and areas with less vigorous pumpkin growth allowed substantial weed biomass production. The 2005 growing season was exceptionally warm and dry. Frost had not killed vines by the harvest date.

All cultivars produced orange pumpkins by the harvest date. The percent of marketable fruit that was orange did not differ significantly between transplant (68%) and direct seed (53%) planting methods, but did differ among varieties. RPX 761 and RPX 089 had the highest percentages of orange pumpkins (82% and 71%) and RPX 771 and Gold Medal had the lowest percentages of orange pumpkins (45% and 48%).

The direct-seeded plots produced 61% of the number and 68% of the weight of orange pumpkins produced by transplanted plots. When both orange and turning pumpkins are considered, direct-seeded plots produced 80% of the number and 86% of the weight produced by transplanted plots.

RPX 761 produced the greatest yield of orange pumpkins, averaging 7.7 tons/acre across transplanted and direct-seeded crops. Magic Lantern averaged 6.2 tons per acre, which was not significantly less than RPX 761. The pie-type RPX 089 produced the lowest yield at 3.5 tons/acre.

If both orange and turning pumpkins are considered, RPX 771 produced the greatest yield at 13.4 tons/acre, followed by Gold Medal at 11.2 tons/acre.

Average weight per pumpkin was not affected by planting method. RPX 771 produced the largest pumpkins at 19.3 lb. each. Gold Medal was next largest at 17.2 lbs. RPX 761 and Magic Lantern were similar at 11.8 and 13.3 lbs., respectively. RPX 089 averaged 3 lbs.

When a similar trial was conducted last year in an exceptionally cool season, direct-seeded Magic Lantern and Gold Medal (the only varieties also in this trial) produced no orange pumpkins. The results from this year show that in a warmer season it is possible to produce orange pumpkins from a crop direct-seeded after wheat. Using transplants would reduce the risk of cool weather during the growing season or an early frost. Among the varieties trialed this year, RPX 761, Magic Lantern and RPX 089 appear the most promising for transplanting after wheat. Improved weed management would probably lead to higher yields. In this production system, lambsquarters that survive the preplant burndown application are likely to be a significant problem if handweeding is not possible.

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Table 1. Number and yield of orange and turning pumpkins, and average pumpkin weight, for five cultivars direct seeded (SD) or transplanted (TR) into wheat stubble, Wanatah, Indiana, 2005.

Cultivar	Seed Source#	Orange Pumpkins			Orange Pumpkins			Orange + Turning			Orange + Turning			Percent Orange			Ave. Frt. Wt. Org.+Turn.			
		SD	TR	Ave.	SD	TR	Ave.	SD	TR	Ave.	SD	TR	Ave.	SD	TR	Ave.	SD	TR	Ave.	
		no./acre			tons/acre			no./acre			tons/acre			% by no.			lb.			
Gold Medal	RU	504	781	643	4.6	7.1	5.9	1235	1361	1298	11.0	11.3	11.2	40	57	48	17.9	16.6	17.2	
RPX 089	RU	1538	2949	2244	2.6	4.4	3.5	2571	3655	3113	4.0	5.3	4.7	61	81	71	3.1	2.9	3.0	
RPX 761	RU	983	1336	1160	6.4	9.0	7.7	1311	1487	1399	8.6	10.0	9.3	75	90	82	13.1	13.5	13.3	
RPX 771	RU	555	655	605	5.5	5.9	5.7	1336	1437	1386	12.7	14.1	13.4	43	47	45	19.1	19.5	19.3	
Magic Lantern	HM	681	1235	958	4.2	8.3	6.2	1386	1865	1626	7.9	11.3	9.6	49	67	58	11.4	12.3	11.8	
Average		852	1392		4.7	6.9		1568	1961		8.9	10.4		53	68		12.9	12.9		
Significance##																				
PM			*			*		**				†			ns				ns	
CV			****	LSD.05 = 293		**	LSD.05 = 1.65	****	LSD.05 = 326		****	LSD.05 = 1.8		****	LSD.05 = 16		****	LSD.05 = 1.6		
PM X CV			**	LSD.05 = 416		ns		*	LSD.05 = 461		ns			ns					ns	

#HM=Harris Moran, RU=Rupp Seeds.

##†, *, **, ***, **** = P<.1, .05, .01, .001, and .0001 for main effect of planting method (PM), cultivar (CV), and their interaction. For PM X CV means, LSD applies to differences between cultivars within a planting method. ns=P>.05.