Influence of tillage systems, winter rye, and preemergence herbicides on pumpkin yield. Walters, S. Alan, Ronald F. Krausz, and Bryan G. Young. 'Wheeler' winter rye or no cover crop along with various herbicide treatments were compared for influence on weed control in tillage and no-tillage pumpkin production, and compared to the standard tillage production system with a mixture of ethalfluralin + clomazone. The study was conducted on an Ebbert silt loam with 1.6% organic matter and pH 6.1 at the Belleville Research Center. Fertilizer applied was 50, 50 and 150 lb/A N, P_2O_5 and K_2O, respectively, prior to planting with an additional 50 lb N/A applied 4 weeks after planting. The area had been cropped to pumpkin in 2001. A blanket application of glyphosate at 2.0% v/v was applied to all plots on June 1, followed by rolling on June 12. Tilled plots were tilled on June 15. 'Applachian' pumpkin was planted 0.5 inch deep, in 48 inch rows, spaced 48 inch within the row on June 18. Plots consisted of one row 20 ft long arranged in a split-split-plot design with 3 replications. Main plots were either tilled or no-till, sub-plots were either 'Wheeler' winter rye cover crop or no cover crop, and sub-sub-plots were herbicide treatment. The herbicides were broadcast applied with a CO_2 pressurized sprayer using 8002 flat fan tips at 40 PSI in 20 GPA water. Monthly rainfall in inches was 4.9, 6.6, 1.7, 3.7 and 3.6 in April, May, June, July and August, respectively. Total rainfall for the 28 days following planting was < 0.1 inch. Weed population per 0.25 m^2 in the nontreated plots, mid-season, was 50+ redroot pigweed and common waterhemp.

Application information is listed below.

Date	Jun-19-02
Treatment	PRE
Air temperature (F)	88
Relative humidity (%)	40
Soil moisture	normal

Mulch coverage of the soil depended on the winter rye and tillage combination: no-tillage with no cover crop had 0% mulch coverage of soil, no-tillage with winter rye cover crop had 95% mulch coverage of soil, tillage with no cover crop had 0% mulch coverage of soil, and tillage with winter rye cover crop had 20% mulch coverage of soil.

None of the treatments provided any observable injury symptoms to pumpkins 21 days after planting (DAP). For redroot pigweed and common waterhemp control, the no-tillage production system reduced weed populations significantly compared to tillage regardless of the presence of a cover crop or the herbicide treatments evaluated (see Table). Limited rainfall after herbicide application occurred. This may have resulted in low levels of weed suppression by 21 DAP in the tillage treatments. No level of weed control was provided by any of the herbicide treatments in the tillage production system by 56 DAP. Due to the lack of moisture available for preemergence herbicide activation, no herbicide treatment showed any advantage over another.

'Applachian' pumpkin yields were influenced by the treatments evaluated (see Table). Due to excessive weed pressure, the nontreated areas in the tillage treatments had excessively low yields, while the same treatments in the no-tillage production systems produced somewhat acceptable yields. The use of winter rye under a no-tillage production system proved to be the best production system evaluated with respect to pumpkin yields (number/A, lb/A, and individual pumpkin size) and this production system resulted in superior weed control as well (see Table). The ethalfluralin + clomazone + halosulfuron treatment tended to result in the greatest numbers of fruit/A and lb/A for all production systems, except for the no cover crop and no-tillage system. The no cover crop and no-tillage system tended to be the least productive system for pumpkin yields based on the handweeded plots. Under the two tillage production systems, the ethalfluralin + clomazone + imazamox treatment also resulted in the greatest pumpkin yields per acre. However, individual pumpkin fruit size tended to be greatest in the handweed treatment regardless of the production system utilized. With no weed competition, the pumpkins were able to develop to their maximum size. By providing superior weed control, the no-tillage production system resulted in the most consistent large pumpkin weights throughout the herbicide treatments evaluated.

This test indicated that the use of a high residue winter rye cover crop in no-tillage pumpkin production provided superior redroot pigweed and common waterhemp control regardless of the preemergence herbicide applied which should directly result in increased yields. (Dept. of Plant, Soil and General Agriculture, Southern Illinois University, Carbondale).

Table. Influence of tillage systems, winter rye, and preemergence herbicides on pumpkin yields. (Walters, Krausz and Young)

Treatment[a]	Rate	Pumpkin fruit weight		Pumpkin injury 21 day after planting	Control days after planting[b] AMARE			AMATA		
					21	56	84	21	56	84
	(lb/A)	lb/A	lb/pumpkin	%	%	%	%	%	%	%
Wheeler winter rye cover crop, tillage at planting										
Ethalfluralin&clomazone	1.0&0.31	17297	9.5	0	33	0	0	33	0	0
Ethalfluralin&clomazone	1.2&0.37	17733	8.5	0	33	0	0	33	0	0
Ethalfluralin&clomazone+halosulfuron	1.0&0.31+0.031	26463	9.3	0	30	0	0	30	0	0
Ethalfluralin&clomazone+imazamox	1.0&0.31+0.036	24158	9.0	0	27	0	0	27	0	0
Handweed		42580	10.2	0	99	99	99	99	99	99
Nontreated		980	5.4	0	0	0	0	0	0	0
No cover crop, tillage at planting										
Ethalfluralin&clomazone	1.0&0.31	20382	9.8	0	68	0	0	70	0	0
Ethalfluralin&clomazone	1.2&0.37	12905	9.2	0	66	0	0	66	0	0
Ethalfluralin&clomazone+halosulfuron	1.0&0.31+0.031	36137	11.3	0	73	43	43	73	43	43
Ethalfluralin&clomazone+imazamox	1.0&0.31+0.036	29403	10.2	0	63	27	27	60	27	27
Handweed		35901	13.5	0	99	99	99	99	99	99
Nontreated		5463	7.6	0	0	0	0	0	0	0
Wheeler winter rye cover crop, no-till										
Ethalfluralin&clomazone	1.0&0.31	46936	10.4	0	99	96	96	99	96	96
Ethalfluralin&clomazone	1.2&0.37	52798	12.3	0	99	96	96	98	95	95
Ethalfluralin&clomazone+halosulfuron	1.0&0.31+0.031	66574	12.4	0	99	93	93	99	93	93
Ethalfluralin&clomazone+imazamox	1.0&0.31+0.036	36627	11.7	0	96	93	93	96	93	93
Handweed		62509	13.6	0	99	99	99	99	99	99
Nontreated		55866	10.7	0	99	27	27	99	27	27
No cover crop, no-till										
Ethalfluralin&clomazone	1.0&0.31	10618	11.1	0	99	99	99	99	99	99
Ethalfluralin&clomazone	1.2&0.37	30365	12.5	0	99	91	91	99	91	91
Ethalfluralin&clomazone+halosulfuron	1.0&0.31+0.031	29457	15.6	0	99	93	93	99	93	93
Ethalfluralin&clomazone+imazamox	1.0&0.31+0.036	23250	13.1	0	99	94	94	99	94	94
Handweed		26372	13.3	0	99	99	99	99	99	99
Nontreated		35774	12.3	0	99	27	27	99	27	27
LSD		27091	3.4	0	12	26	26	12	26	26
P		0.01	0.01	1.0	0.01	0.01	0.01	0.01	0.01	0.01

[a]A blanket application of glyphosate at 2.0% v/v was applied to all plots on June 1, followed by rolling on June 12.
[b]Ratings at 21, 56, and 84 days after planting were on Jul-9-02, Aug-13-02, and Sep-10-02, respectively.