Zucchini no-till weed management study. Walters, S. Alan, Scott A. Nolte, Joseph L. Matthews, and Bryan G. Young. No-tillage production systems were evaluated with or without a 'Wheeler' winter ryegrass cover crop utilizing various herbicide treatments for weed control in zucchini squash production and were compared to the standard tillage production system with a preemergence ethalfluralin + clomazone herbicide mixture. The study was conducted at an off-station location in Alto Pass, IL. Fertilizer applied was 75, 40, and 40 lb/A of N, P_2O_5, and K_2O, respectively, to an area that had been cropped to zucchini in 2001. All plots were sprayed (glyphosate at 2% v/v) and mowed on April 8. 'Independence II' zucchini was transplanted, in 48 inch rows, spaced 24 inch within the row, in a no-till seedbed on May 3. Plots consisted of two rows 10 ft long arranged in a split-plot design with 4 replications. Main plots were either winter rye cover crop or no cover crop and sub-plots were herbicide treatment. The herbicides were broadcast applied with a CO_2 pressurized sprayer using 8003 flat fan tips at 40 PSI in 20 GPA water. Rainfall was adequate following the soil herbicide application. Weed population per 0.25 m^2 in the nontreated plots, mid-season, was <1 redroot pigweed and smooth crabgrass.

Application information is listed below.

Date	Apr-29-02
Treatment	PRE
Air temperature (F)	68
Relative humidity (%)	50
Soil moisture	normal

Winter ryegrass provided about 20% mulch coverage to the soil in those treatments in which winter ryegrass was used. Excessive injury and stunting of 'Independence II' zucchini squash plants were provided by halosulfuron, ethalfluralin + clomazone + halosulfuron, and ethalfluralin + clomazone + dimethenamid regardless of the presence of a winter ryegrass cover crop (see Table); however, greater injury with these treatments tended to be observed when no winter ryegrass cover crop was used. The ethalfluralin + clomazone + imazamox also provided some minor but acceptable levels of injury and stunting to squash plants. All other treatments resulted in no significant amounts of injury or stunting to plants.

Most treatments provided excellent control of redroot pigweed and smooth crabgrass at 28 days after planting (DAP), and appeared not to be influenced by the presence or absence of winter ryegrass (see Table). However, redroot pigweed and smooth crabgrass control was poor in most treatments by 56 DAP. Tillage with the standard preemergence application of ethalfluralin + clomazone provided the best overall weed control.

Zucchini yields were influenced by the treatments evaluated (see Table). The use of winter rye appeared to decrease yields, as the handweeded treatments with winter rye tended to have lower yields compared to the handweeded treatments without winter rye. The halosulfuron and ethalfluralin + clomazone + halosulfuron treatments resulted in lower total-season yields compared to other treatments (even the non-treated treatments) regardless of the presence or absence of winter rye, which resulted from the significant amounts of injury and stunting provided to 'Independence II' zucchini plants by these herbicides. The ethalfluralin + clomazone + dimethenamid treatment had low yield when no cover crop was used; however, it was similar to the best yielding treatments when winter rye was used. When tillage was used, the ethalfluralin + clomazone treatments provided high yields regardless of the presence of absence of a wither rye cover crop; however, under no-tillage conditions, the ethalfluralin + clomazone treatments provided high yields without winter rye and low yields with winter rye. The ethalfluralin + clomazone + imazamox was the best yielding no-tillage treatment and provided consistent results regardless of whether a winter rye cover crop was used or not. (Dept. of Plant, Soil and General Agriculture, Southern Illinois University, Carbondale).

Table. Zucchini no-till weed management study. (Walters, Nolte, Matthews and Young)

Treatment[a]	Application Rate	Application Time	Zucchini, days after planting[b] Injury 14	Injury 28	Injury 56	Stunting 14	Stunting 28	Stunting 56	Contol days after planting AMARE 28	AMARE 56	DIGIS 28	DIGIS 56	Zucchini fruit weight
	(lb/A)		%	%	%	%	%	%	%	%	%	%	lb/A
Wheeler winter rye cover crop													
Tillage at planting +ethalfluralin&clomazone	1.0&0.31	PRE	0	0	0	0	0	0	99	88	99	95	15518
Ethalfluralin&clomazone	1.0&0.31	PRE	0	3	0	0	3	0	99	75	99	80	12451
Halosulfuron	0.031	PRE	0	48	26	0	48	26	98	71	85	45	6244
Ethalfluralin&clomazone +halosulfuron	1.0&0.31 +0.031	PRE	0	50	19	0	49	19	99	80	96	79	9474
Ethalfluralin&clomazone +imazamox	1.0&0.31 +0.036	PRE	0	16	0	0	16	0	98	79	98	69	18114
Ethalfluralin&clomazone +dimethenamid	1.0&0.31 +2.0	PRE	0	19	0	0	19	0	98	59	99	78	14502
Nontreated			0	0	0	0	0	0	0	0	0	0	11162
Handweed			0	0	0	0	0	0	0	99	0	99	15863
No cover crop													
Tillage at planting +ethalfluralin&clomazone	1.0&0.31	PRE	0	6	0	0	6	0	99	96	99	95	17442
Ethalfluralin&clomazone	1.0&0.31	PRE	0	0	0	0	0	0	99	91	99	92	23504
Halosulfuron	0.031	PRE	0	56	18	0	53	18	99	90	90	50	5790
Ethalfluralin&clomazone +halosulfuron	1.0&0.31 +0.031	PRE	0	60	20	0	54	20	99	92	99	89	7514
Ethalfluralin&clomazone +imazamox	1.0&0.31 +0.036	PRE	0	10	0	0	10	0	99	96	99	86	18495
Ethalfluralin&clomazone +dimethenamid	1.0&0.31 +2.0	PRE	0	45	15	0	43	15	99	89	99	90	11289
Nontreated			0	0	0	0	0	0	0	0	0	0	19983
Handweed			0	0	0	0	0	0	0	99	0	99	20401
LSD			0	12	4	0	11	4	1	13	7	13	4938
P			1.0	0.01	0.01	1.0	0.01	0.01	0.01	0.01	0.01	0.01	0.01

[a]All plots mowed and sprayed (glyphosate 2.0 %) on April 8.

[b]Ratings at 14, 28, and 56 days after planting were also 18, 32, and 60 days after PRE application, respectively.

Ratings at 14, 28, and 56 days after planting were on May-17-02, May-31-02, and Jun-28-02, respectively.

Regarding weed control ratings, weed populations were sporadic and non-uniform, especially common waterhemp.

Cover crop residue was somewhat dispersed by heavy rainfall, was generally sparse, and did not contribute to weed control.

Handweeded plots were handweeded after the 28 days after planting rating.