

Organic Transitions Experiment Weed and Yield Data

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For soybeans, sweetpotatoes, and cabbage, 2, 10 ft rows were harvested in proximity to each of the 5 sampling points within the diagnostic soil per plot. Wheat yields were collected by harvesting 4, 10- ft rows in proximity to each of the five sampling points per plot. In this study, averaged over the two starts, conventional soybean yields were 47.2 bushels/acre and organic yields were 42.4 bushels/acre. Overall treatment effect was not significant in either 2000 or 2001, nor when averaged over starts. Nevertheless, when averaging over starts, and contrasting between those plots where herbicides were used and not, the average yield for those treatments with herbicides (1,3,5,6) were significantly higher than those treatments without herbicides (2,4). There were no significant treatment or treatment by start interaction effects for marketable sweetpotato yields. Percent damage (ANOVA on arcsine transformed data) revealed a treatment effect and a marginal year by start interaction. Conventionally managed sweetpotatoes had less damage than those managed organically or those gradually transitioned to organic in the first start. In 2002, conventional wheat yields averaged 44.5 bu/ac and organic wheat yields averaged 39.6 bu/ac, but these were not significantly different. The organic transitional treatment with organic pest management but conventional fertilizers yielded higher (46 bu/ac) than the treatment where a gradual reduction of all inputs was employed (35.1 bu/ac). In 2003, the conventional wheat yielded higher (50.7 bu/ac) than the organic wheat (32.7 bu/ac), most likely attributable to nitrogen deficiency in the organic plots. Cabbage yields in 2003 were very low due to failure of transplant supplier to produce quality transplants resulting in a significant delay in planting. In 2004, cabbage yields averaged 14,111 kg/ha in the conventional plots and 10,019 kg/ha in the organic plots but this was not a significant difference.

Soybean Yield kg/ha (bu/ac)

Treatment	October 27,2000	October 31, 2001
Conventional	3262 (48.4)	3104(46.0)
Organic	2793 (41.4)	2927 (43.4)
Organic Fertilizer	3224 (47.8)	3126 (46.4)
Organic Weed Management	2789 (41.4)	2893 (42.9)
Organic Pest Management	3140 (46.6)	3074 (45.6)
Gradual Transition	3127 (46.4)	2872 (42.6)
	Ns	Ns

Sweetpotato Yield (kg/ha) averaged over both years			Oct 9, 01	Oct 3, 02
Treatment	Weight ones	Marketable	% damage	% damage
Conventional	20,914	19,469	6.7 a	6.9
Organic	22,004	17,458	38.3 b	8.9
Organic Fertilizer	22,400	19,122	23.0 ab	8.1
Organic Weed Mngt	22,432	19,727	22.7 ab	6.5
Organic Pest Mngtt	21,600	19,371	19.6 ab	5.1

Gradual Transition	21,834	17,216	40.6 b	8.3
	Ns	Ns	p=0.05	Ns

Wheat Yield kg/ha (bu/ac)

Treatment	June 10, 2002	June 16, 2003
Conventional	3003 (44.5) ab	3418 (50.7) a
Organic	2667 (39.5) bc	2205 (32.7) bc
Organic Fertilizer	2982 (44.2) ab	2881 (42.7) ab
Organic Weed Management	2786 (41.3) abc	2244 (33.3) bc
Organic Pest Management	3101 (46.0) a	1774 (26.3) c
Gradual Transition	2369 (35.1) c	2743 (40.7) abc
	p=.029	p=.058

Marketable Cabbage Yield (kg/ha)

Treatment	January 14, 2003	Nov-Jan (4 harvests), 2004
Conventional	1382	14,111
Organic	4077	10,019
Organic Fertilizer	3248	14,677
Organic Weed Management	2839	11,092
Organic Pest Management	3977	12,261
Gradual Transition	4059	14,130
	Ns	Ns

Weed counts were taken periodically throughout each cropping season and weed biomass sampled at the end of each season. Key species included pigweed (*amaranthas* spp.) broadleaf signalgrass (*Brachiaria platyphylla*), large crabgrass (*Digitaria sanguinalis*), sicklepod (*Senna obtusifolia*), wild radish (*Raphanus raphanistrum*) and prickly sida (*Sida spinosa*). Averaging over starts and crops, the treatment effect is significant at 10% level (.09). There was a significant difference (p=.005) when contrasting the no herbicide treatments with the treatments where herbicide was used. The mean count (per .5 m sq) in no-herbicide treatments exceeded that in the full herbicide treatments by 3.8.

A related experiment was conducted to determine the critical weed free period for organic sweetpotatoes. At both planting dates, there was a critical weed-free period of 2 to 6 wk after transplanting.

