

Organic Systems Trial

Transitional Grain Systems

Crop Rotation

- Crop 1 Soybeans/ Spelt
- Crop 2 Spelt/Red Clover
- Crop 3 Corn
- Repeat
- Entry Point 1 starts with soybeans; EP 2 starts with corn

Experimental Design

- Five treatments, 4 replications
- Two entry points:
 - 2005, Entry Point 1—soybeans
 - 2005, Entry Point 2—corn

Approximate total fertility inputs

Conventional corn

- 111-40-40 (N-P-K)

Organic corn

- 168-65-96
- Treatment 1—268-77-156
- Only partially available the first year

Soybeans—none

How were organic systems treated differently in 2005?

- EP 1—soybeans

Systems 1 and 3 received gypsum, 400 #/acre

Systems 1 and 2 cultivated twice; systems 3 and 4 cultivated three times

System 4 ridged with ridge-till cultivator

- EP 2—corn

System 1 received extra compost, 10 tons/acre (fresh weight)

Systems 1 and 3 received gypsum, 400 #/acre

System 4 ridged with ridge-till cultivator

Systems 1, 3 and 4 underseeded with rye and spelt

System 1

- This system simulates a farm where the goals are to maximize income via high fertility inputs. Compost is the primary nutrient and organic matter input. Cover crops used to retain N over winter.
- Standard tillage & cultivation tools

System 2

- This system simulates a typical cash grain farm with limited nutrient inputs. No extra fertilizer or cover crops.
- Standard tillage & cultivation tools

System 3

- This system simulates a cash grain farm with limited nutrient inputs but heavier emphasis on weed management. Winter cover crops used to help suppress weeds.
- Standard tillage & enhanced cultivation tools; use of fallows, stale seedbed techniques.

System 4

- This system relies on a ridge tillage and cultivation program. This will allow for reduced heavy tillage and controlled field traffic. Winter cover crops used to enhance soil health.

System 5

- Conventional system using standard tillage, seed treatments, fertilizers, and herbicides. No winter cover crops.
- Same varieties and certified organic seed as other treatments
- These plots are separated from the other treatments by a 50 foot buffer

2005 Results

(So far)

Soybean stand

■ Treatment 1	112,000	c
■ Treatment 2	117,000	bc
■ Treatment 3	121,000	bc
■ Treatment 4	129,000	b
■ Treatment 5	151,000	a

(different letters- statistically different)

Difference between conventional (5) and others was due to mortality during tine weeding in the organic treatments

Soybean yields

- Treatment 1 38 bu/acre
- Treatment 2 37
- Treatment 3 40
- Treatment 4 35
- Treatment 5 38

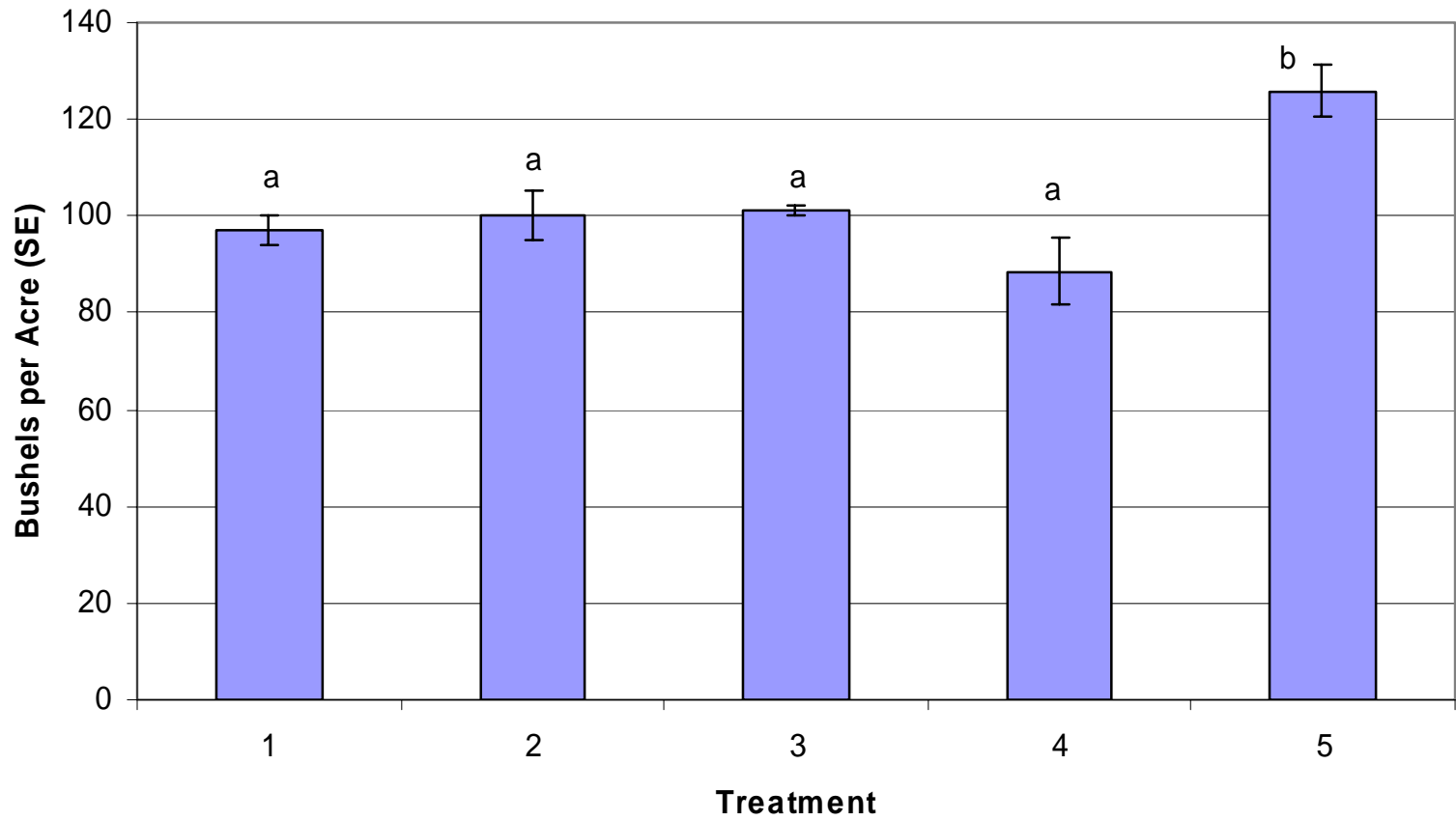
(not statistically different)

Corn stand

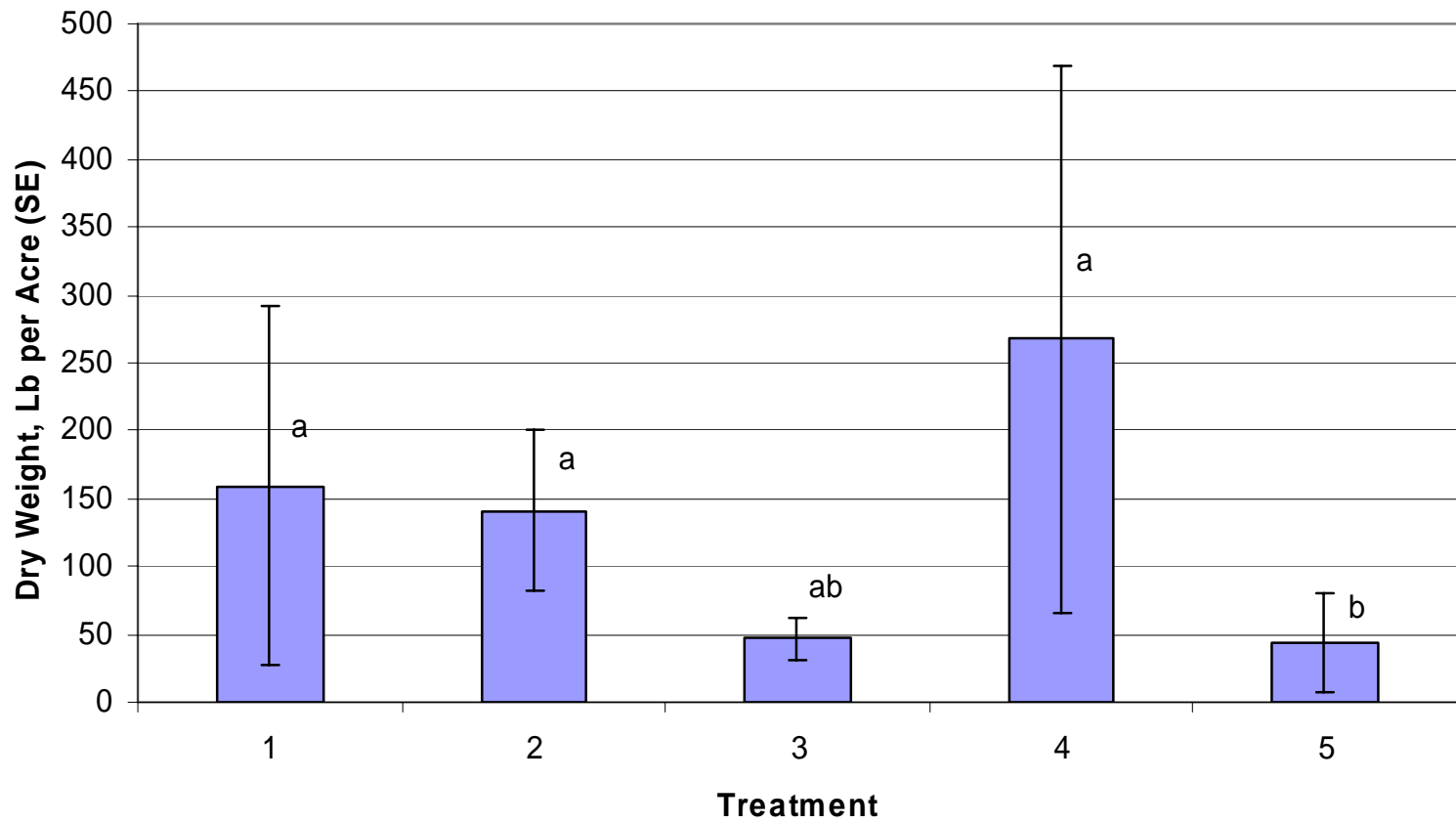
■ Treatment 1	18,200	b
■ Treatment 2	20,900	ab
■ Treatment 3	17,500	b
■ Treatment 4	17,800	b
■ Treatment 5	23,800	a

Difference between conventional (5) and others was due to mortality during tine weeding in the organic treatments

Corn Yield, 2005



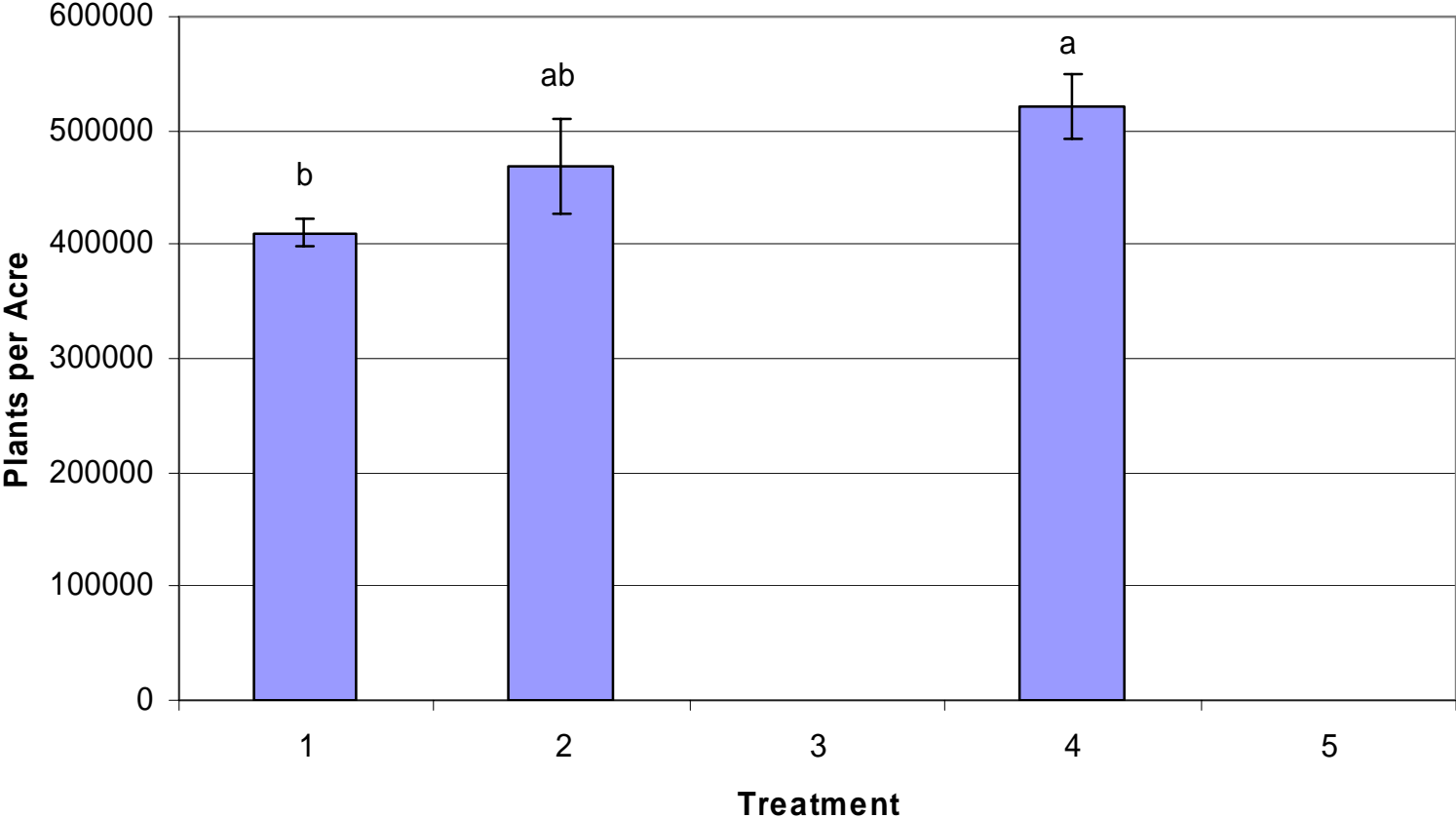
Total Weed Biomass in Corn, 2005



Corn weed biomass (g/m²)

System	Annual seedlings	Broadleaf from root	Yellow Nutsedge	Total
1	13.5	1.3 b	3.2 a	17.9 a
2	7.1	3.4 ab	5.4 a	15.9 a
3	0.6	0.4 b	4.2 a	5.2 ab
4	3.9	23.8 a	2.3 a	30.1 a
5	2.3	2.6 b	0.0 b	4.9 b

Corn Cover crop Counts, 11.08.05



Insect Results

- No differences between treatments for aboveground insects in either crop
- Soybean aphids did not exceed threshold—may have been controlled by beneficials
- Corn rootworms were not a problem in any treatment