

Tables and graphs related to GNC09-110: Relationship between organic fertility management, plant nutrition, and insect reponse

Table 1 – Selected characteristics of soil from two organic treatments and a conventional comparison before (2006) and after (2010) several years of amendments as discussed in the text. Conventional plots were added to the experimental design in 2008 and are in a field directly adjacent to the field containing the long-term organic fertility systems trial. Values shown are means of four replicates of each treatment. If no letters are present within a column, values in that column do not differ. If letters are present, values not sharing a lower-case letter are significantly different within each column by ANOVA and Tukey’s HSD at the P = 0.05 level.[¶]

	Percent organic matter*		pH		P ppm		K ppm		Ca ppm		Mg ppm	
	2006	2010	2006	2010	2006	2010	2006	2010	2006	2010	2006	2010
Standard organic fertility	3.4	3.6	6.7	6.6	76	65	207	199 a	1629	1991 a	559	600 a
BCSR organic fertility	3.1	3.5	6.7	6.9	72	64	183	173 b	1598	2321 b	552	492 bc
Conventional fertility	N/A	3.6	N/A	6.7	N/A	74	N/A	329 b	N/A	1809 c	N/A	527 c

[¶] While these data meet assumptions for ANOVA, results represent preliminary analysis. Proper analysis may involve building models that incorporate a block effect for each variable within each year.

* Analytical methods used: organic matter, loss on ignition; pH, water (1:1); P, weak Bray (Bray 1); K, Ca, Mg, extracted with 1 M NH₄OAc at pH 7. Analyses performed Midwest Laboratories, Omaha, NE.

Table 2 – Cation-related characteristics of soil from two organic treatments and a conventional comparison before (2006) and after (2010) several years of amendments as discussed in the text. Conventional plots were added to the experimental design in 2008 and are in a field directly adjacent to the field containing the long-term organic fertility systems trial. Values shown are means of four replicates of each treatment. If no letters are present within a column, values in that column do not differ. If letters are present, values not sharing a lower-case letter are significantly different within each column by ANOVA and Tukey’s HSD at the P = 0.05 level.[¶]

	Cation exchange capacity (cmol _c per kg)		Percent saturation with Ca		Percent saturation with Mg		Percent saturation with K		Ratio of percent Ca saturation to percent Mg saturation	
	2006	2010	2006	2010	2006	2010	2006	2010	2006	2010
Standard organic fertility	13.9	16.4 a	58.9	61.0 a	33.6	30.6 a	3.8	3.1 a	1.75	2.00 a
BCSR organic fertility	13.6	16.4 a	58.7	70.7 b	33.9	25.0 b	3.4	2.7 a	1.74	2.84 b
Conventional fertility	N/A	14.5 b	N/A	62.3 a	N/A	30.3 a	N/A	5.8 b	N/A	2.06 a

[¶] While these data meet assumptions for ANOVA, results represent preliminary analysis. Proper analysis will likely involve building models that incorporate a block effect for each variable within each year.

*Analytical methods used: K, Ca, Mg, and Na extracted with 1 M NH₄OAc at pH 7 (Na not shown; levels were very low), protons (H, not shown, present at low levels) estimated from buffer pH. Analyses performed Midwest Laboratories, Omaha, NE.

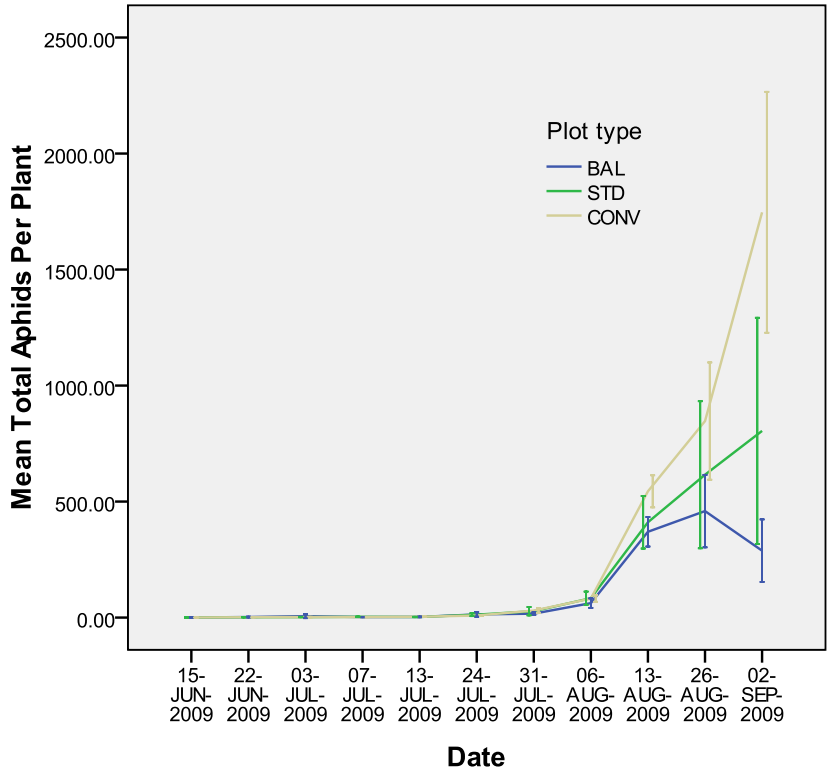


Fig. 1 – Aphid populations in plots of three treatments (BAL = BCSR organic, STD = Standard organic, CONV = Conventional) in summer 2009. Error bars represent +/- 2 SE.

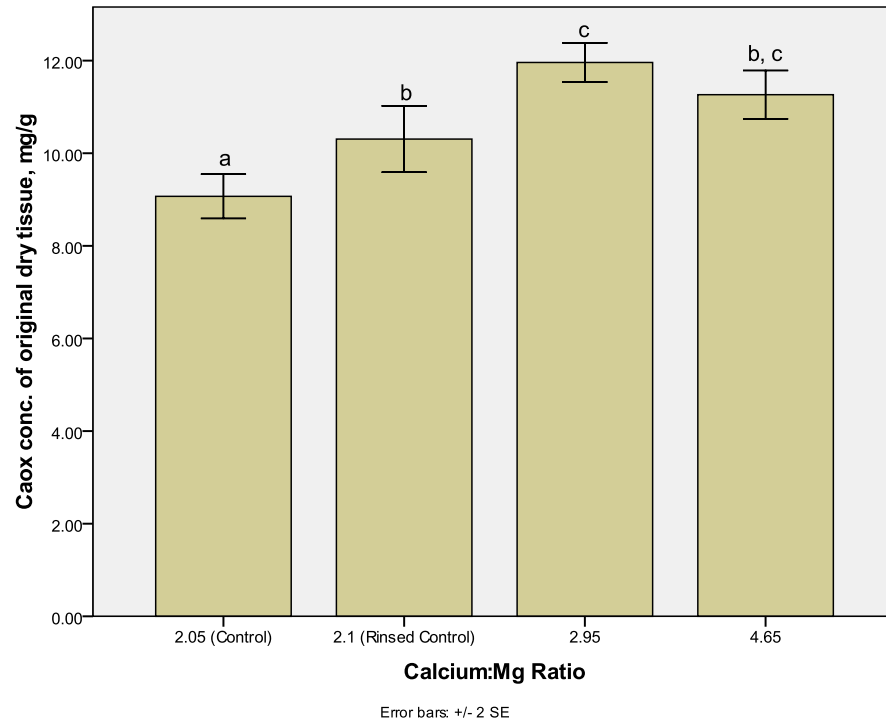


Fig. 2 – Calcium oxalate content of dry leaf tissue from soybean plants grown in soil of varying cation ratios. The “rinsed control” treatment involved soil that had been repeatedly saturated with water in a way that mimicked the modification process but did not involve concentrated calcium and magnesium salts. Columns not sharing a letter are significantly different by ANOVA and Tukey’s HSD at the $P = 0.05$ level. Calcium oxalate levels were determined using a kit and protocol (available from Trinity Biotech, Dublin, Ireland).