

Table 1. Radish N uptake before the first frost for the whole plant which included both leafy aboveground biomass and belowground main taproot biomass. Mean values (in columns and within years) followed by different letters indicate statistically significant differences at $\alpha = 0.10$ level.

Year	Treatment	N Uptake ⁺ kg ha ⁻¹	C:N [†]
2011	RAD	202	11.5
	RAD+67	201	11.9
	P > F	0.977	0.856
2012	RAD	43.4 b	15.7 a
	RAD+67	78.6 a	13.0 b
	P > F	0.003	0.020
2013	RAD	19.7 b	10.1
	RAD+67	38.6 a	11.0
	P > F	0.0002	0.158

⁺ N Uptake- average N uptake across 4 reps

[†] C:N- average C:N ratio across 4 reps

Table 2. Radish N uptake before the first frost for aboveground biomass (included leafy tops) and belowground biomass (included main taproot but no other roots). Mean values (in columns and within years) followed by different letters indicate statistically significant differences at $\alpha = 0.10$ level.

Year	Treatment	Plant Parts‡	N Uptake ⁺ kg ha ⁻¹	C:N†
2012	RAD	AGB	25.1 ab	13.8 b
		BGB	18.4 b	17.6 a
	RAD+67	AGB	42.0 a	12.1 b
		BGB	36.6 ab	13.9 b
	P > F		0.183	0.157
2013	RAD	AGB	13.1 b	9.03 b
		BGB	6.28 b	11.7 a
	RAD+67	AGB	27.8 a	10.1 b
		BGB	10.8 b	12.0 a
	P > F		0.013	0.324

‡ AGB- above ground biomass, BGB- below ground biomass

⁺ N Uptake- average N uptake across 4 reps

[†] C:N- average C:N ratio across 4 reps

Table 3. Soil nitrate concentrations at two depths at the time of radish biomass collection. Mean values (in columns, within years) followed by different letters indicate statistically significant difference at $\alpha = 0.10$ level.

Year	Month	Treatment	Depth‡	
			0-30 cm	30-60 cm
			-----mg kg ⁻¹ -----	
2011	November	NR	4.73	2.98
		RAD	8.15	3.48
		RAD+67	6.23	2.46
		P>F	0.262	0.726
2012	November	NR	0.78 b	0.146
		RAD	4.90 a	3.28
		RAD+67	1.51 ab	1.29
		P>F	0.070	0.336
2013	November	NR	3.29	2.02
		RAD	2.27	1.49
		RAD+67	2.36	1.77
		P>F	0.313	0.529

‡ Depth- average soil N concentrations across 4 reps for two separate depths (0-30 and 30-60 cm)

Table 4. Soil nitrate concentrations at two depths for the pre-plant nitrate test (PPNT) at the time of corn planting. Mean values (in columns, within months and years) followed by different letters indicate statistically significant difference at $\alpha = 0.10$ level.

Year	Month	Treatment	Depth‡		N Credit†
			0-30 cm	30-60 cm	
			-----mg kg ⁻¹ -----		kg ha ⁻¹
2012	April	NR	16.8 b	6.17 b	78
		RAD	19.3 ab	8.84 b	110
		RAD+67	21.5 a	12.9 a	151
		P>F	0.051	0.003	
	May	NR	17.2 b	5.46 c	75
		RAD	29.4 a	15.7 b	208
		RAD+67	38.1 a	21.2 a	290
		P>F	0.003	<0.0001	
2013	May	NR	2.01	1	0
		RAD	2.78	1.19	0
		RAD+67	4.98	2.63	0
		P>F	0.180	0.402	
2014	May	NR	3.66	2.57	0
		RAD	3.83	2.44	0
		RAD+67	4.22	3.14	0
		P>F	0.262	0.489	

‡ Depth- average soil N concentrations across 4 reps for two separate depths (0-30 and 30-60 cm)

† N Credit- calculated N credit according to UW-Extension guidelines

Table 5. Soil nitrate concentrations for the pre-sidedress nitrate test (PSNT) and throughout the rest of the corn growing season. June 2013 and July 2014 were PSNT samples; therefore, N credits were calculated. Mean values (in columns, within months and years) followed by different letters indicate statistically significant difference at $\alpha = 0.10$ level.

Year	Month	Treatment	Depth‡	N Credit†
			0-30 cm	
			mg kg ⁻¹	kg ha ⁻¹
2013	June	NR	8.78	0
		RAD	11.8	10
		RAD+67	11.4	10
		P>F	0.451	
	July	NR	0.52	
		RAD	3.86	
		RAD+67	0.54	
		P>F	0.348	
	August	NR	0.02	
		RAD	1.05	
		RAD+67	0.21	
		P>F	0.347	
	October	NR	1.85	
		RAD	1.47	
		RAD+67	2.98	
		P>F	0.347	
2014	July	NR	0.87	0
		RAD	0.88	0
		RAD+67	0.97	0
		P>F	0.856	
	August	NR	0.53	
		RAD	0.45	
		RAD+67	0.50	
		P>F	0.707	

‡ Depth- average soil N concentrations across 4 reps for one depth (0-30 cm)

† N Credit- calculated N credit according to UW-Extension guidelines

Table 6. Average corn yield and ANOVA results for 2012 and 2013 for cover crop, N rate, and interaction effects. Mean values (in columns, within effects) followed by different letters indicate statistically significant difference at $\alpha = 0.10$ level.

Effect	Treatment	2012	2013
-----Yield (Mg ha ⁻¹)-----			
Cover Crop	NR	9.65	10.1 ab
	RAD	10.0	9.96 b
	RAD+67	10.1	10.8 a
N Rate	0	10.1	6.90 e
	44.8	10.4	8.45 d
	89.6	10.1	9.97 c
	134.4	9.95	11.3 bc
	179.2	9.74	12.3 ab
	224	9.15	12.9 a
		P>F	P>F
	Cover Crop	0.441	0.047
	N Rate	0.208	<0.0001
	Cover Crop x N Rate	0.163	0.445

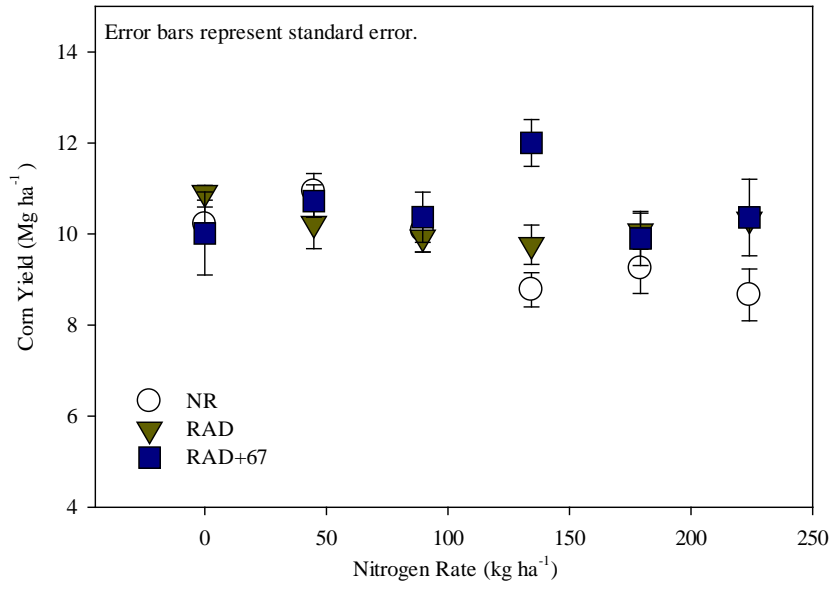


Figure 1. Average corn grain yields across 4 reps for 2012 across all N rates.

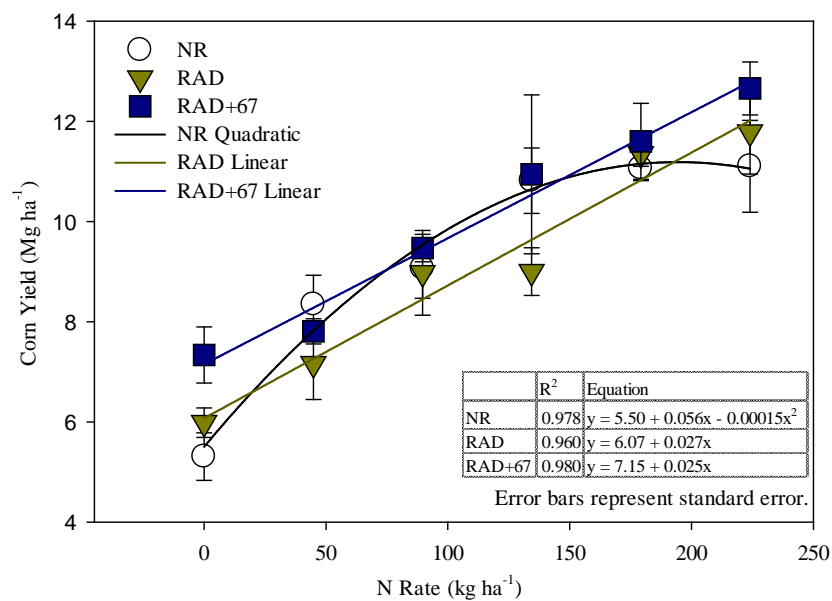


Figure 2. Average corn grain yields across 4 reps for 2013 across all N rates. Lines and curves represent those determined as best fit by linear regression for each treatment.

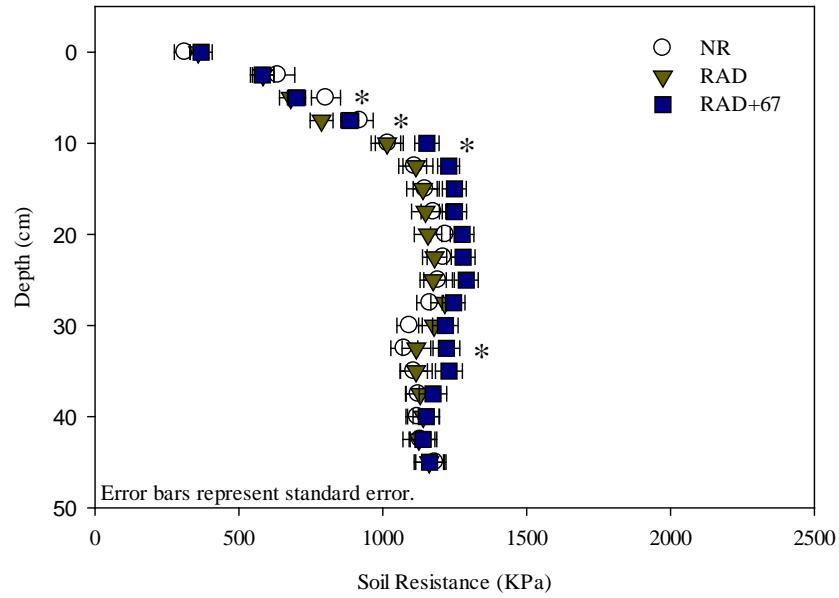


Figure 3. Average soil resistance values across 4 reps for each sampled depth for June 2013.
 *Statistically significant differences among treatments at 5 cm, 7.5 cm, 10 cm, and 32.5 cm at $\alpha = 0.10$ level.

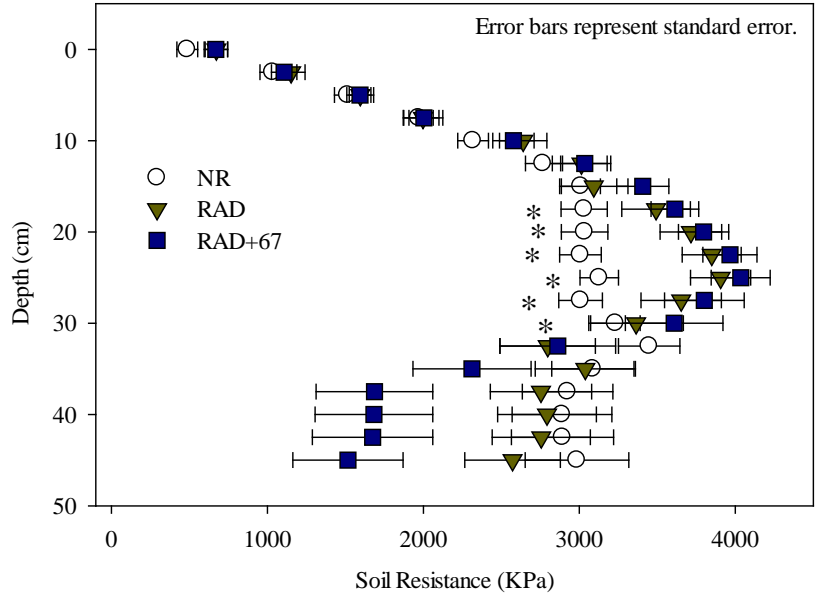


Figure 4. Average soil resistance values across 4 reps for each sampled depth for August 2013.
 *Statistically significant differences among treatments at 17.5 cm, 20 cm, 22.5 cm, 25 cm, 27.5 cm, and 30 cm at $\alpha = 0.10$ level.

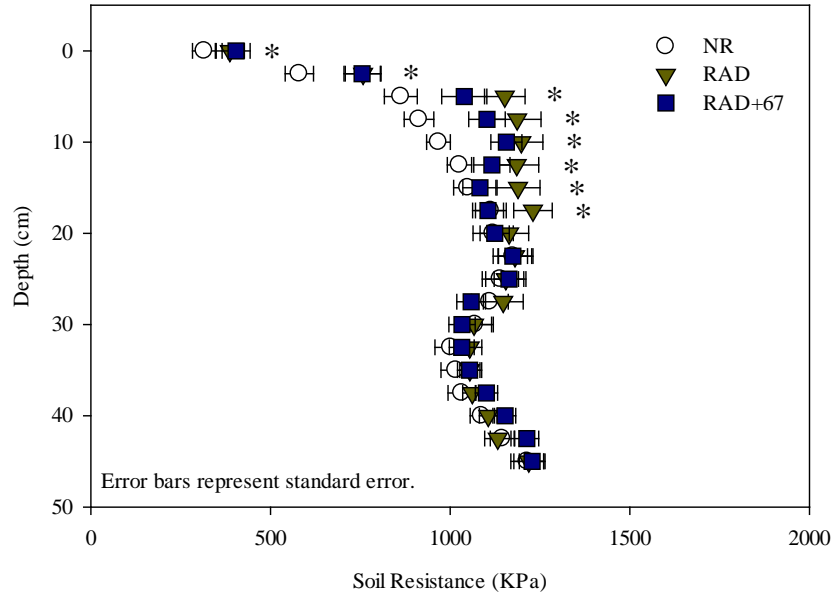


Figure 5. Average soil resistance values across 4 reps for each sampled depth for June 2014.
 *Statistically significant differences among treatments at 0 cm, 2.5 cm, 5 cm, 7.5 cm, 10 cm, 12.5 cm, 15 cm, and 17.5 cm at $\alpha = 0.10$ level.

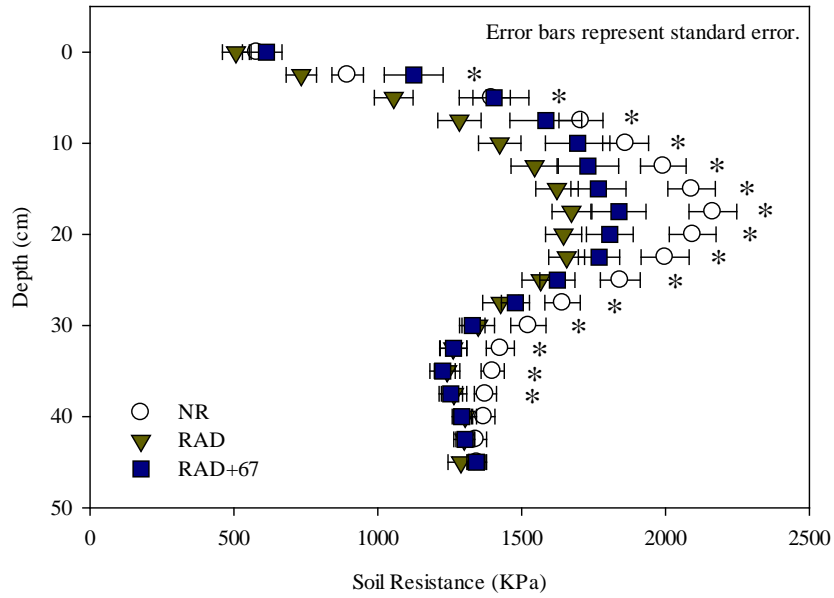


Figure 6. Average soil resistance values across 4 reps for each sampled depth for July 2014.
 *Statistically significant differences among treatments at 2.5 cm, 5 cm, 7.5 cm, 10 cm, 12.5 cm, 15 cm, 17.5 cm, 20 cm, 22.5 cm, 25 cm, 27.5 cm, 30 cm, 32.5 cm, 35 cm and 37.5 cm at $\alpha = 0.10$ level.

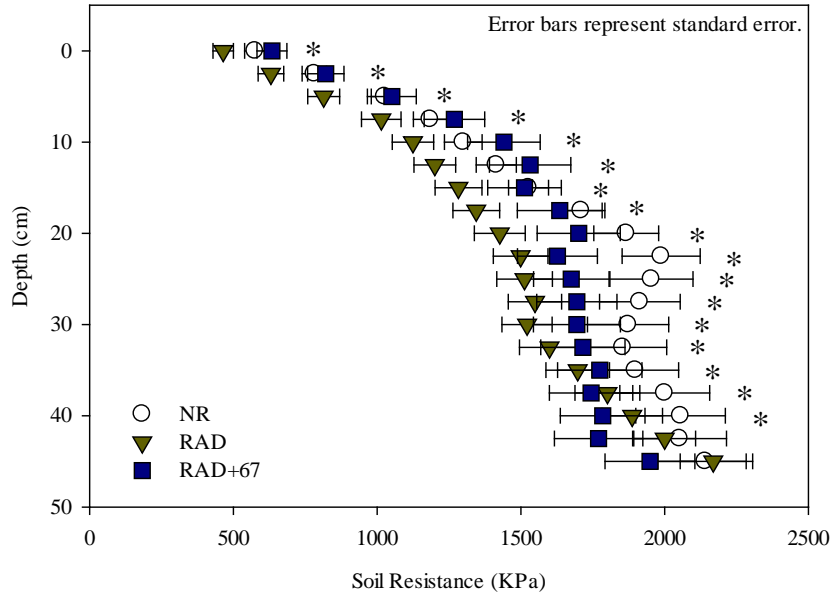


Figure 7. Average soil resistance values across 4 reps for each sampled depth for August 2014.
 *Statistically significant differences among treatments at 0 cm, 2.5 cm, 5 cm, 7.5 cm, 10 cm, 12.5 cm, 15 cm, 17.5 cm, 20 cm, 22.5 cm, 25 cm, 27.5 cm, 30 cm, 32.5 cm, 35 cm, 37.5 cm, and 40 cm at $\alpha = 0.10$ level.

Table 7. Radish biomass before the first frost, collected at each site in both years. Biomass included both aboveground biomass (included leafy tops) and belowground biomass (included main taproot but no other roots).

Year	Site	Treatment	Plant Parts‡	Biomass ⁺	SE
				kg ha ⁻¹	
2012	1	RAD	AGB	906	136
			BGB	813	244
			whole	1718	
		RAD+67	AGB	1313	129
			BGB	1284	103
			whole	2597	
2012	2	RAD	AGB	3222	189
			BGB	3632	283
			whole	6855	
2013	2	RAD	AGB	2885	324
			BGB	2548	180
			whole	5433	
2013	3	RAD	AGB	3289	295
			BGB	2950	148
			whole	6239	

‡ AGB- aboveground biomass which included only leafy tops, BGB- belowground biomass which included only main taproot, whole- whole plant biomass which includes both leafy aboveground biomass and belowground main taproot

* Biomass- averaged biomass across 4 reps, SE- standard error of biomass across 4 reps

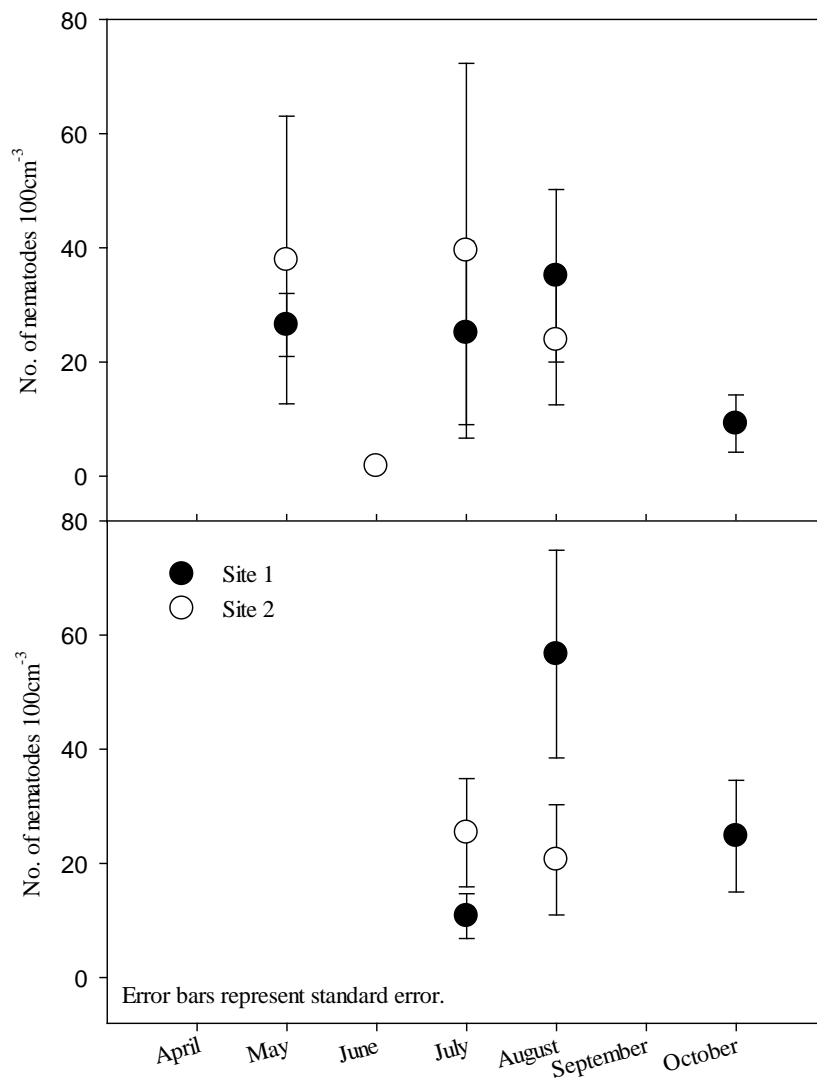


Figure 8. Root lesion nematode counts for Site 1 and Site 2 for all sampling dates in 2013 for ON subplot (top) and for 168 or 179N subplot (bottom). All treatments at each date at each site were averaged to create a grand mean.

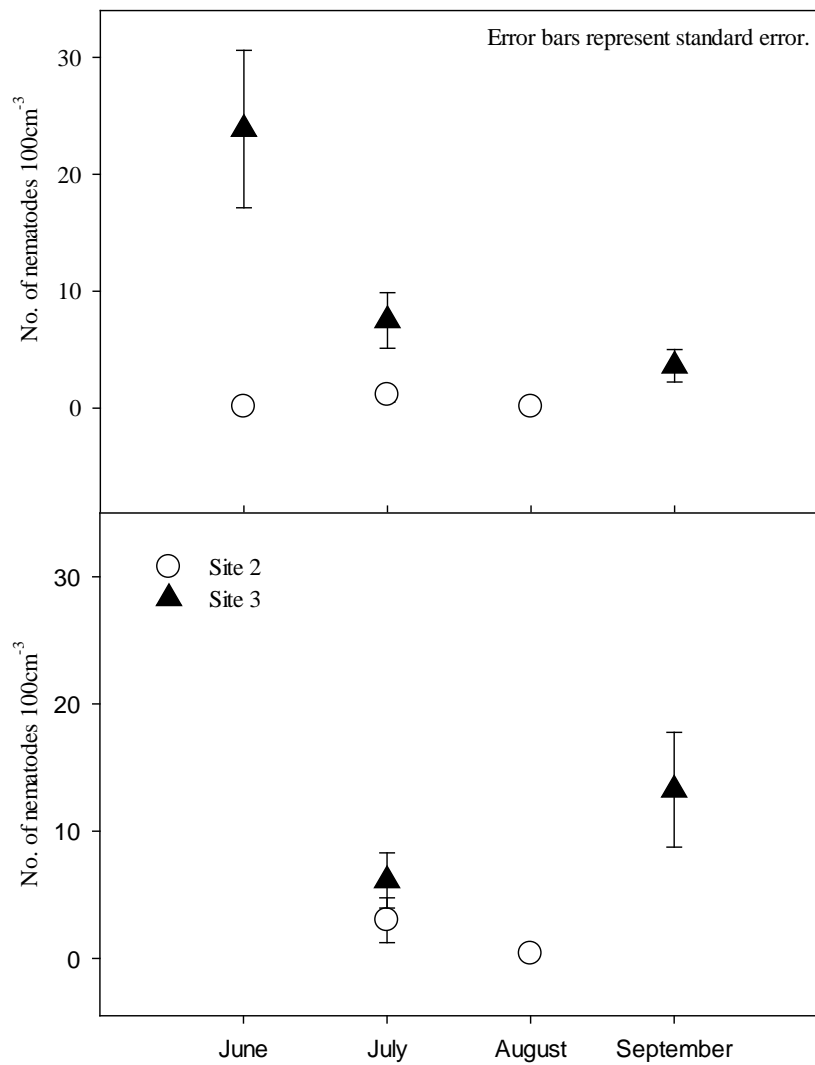


Figure 9. Root lesion nematode counts for Site 2 and Site 3 for all sampling dates in 2014 for 0N subplot (top) and for 168 or 179N subplot (bottom). All treatments at each date at each site were averaged to create a grand mean.

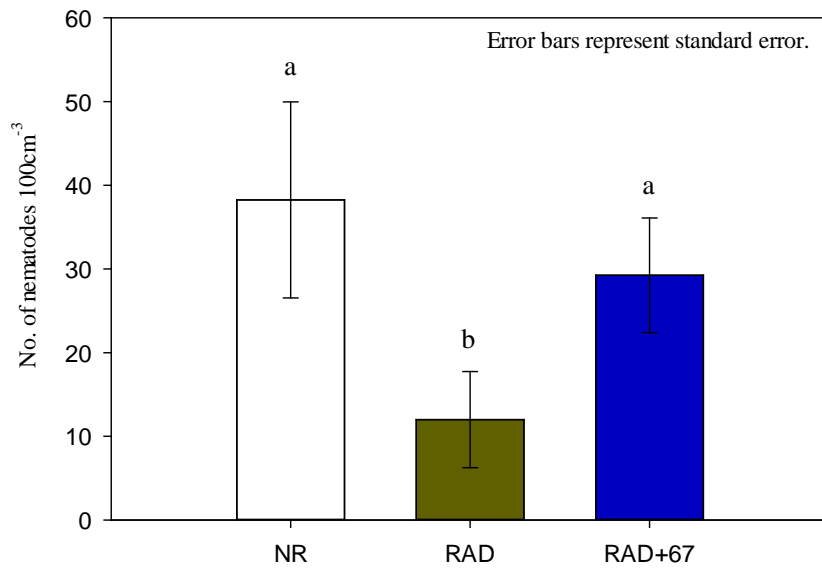


Figure 10. Root lesion nematode counts for Site 1 on 14 May 2013. Counts for each cover crop treatment were averaged across 4 reps. Different letters indicate statistically significant difference at $\alpha = 0.10$ level.

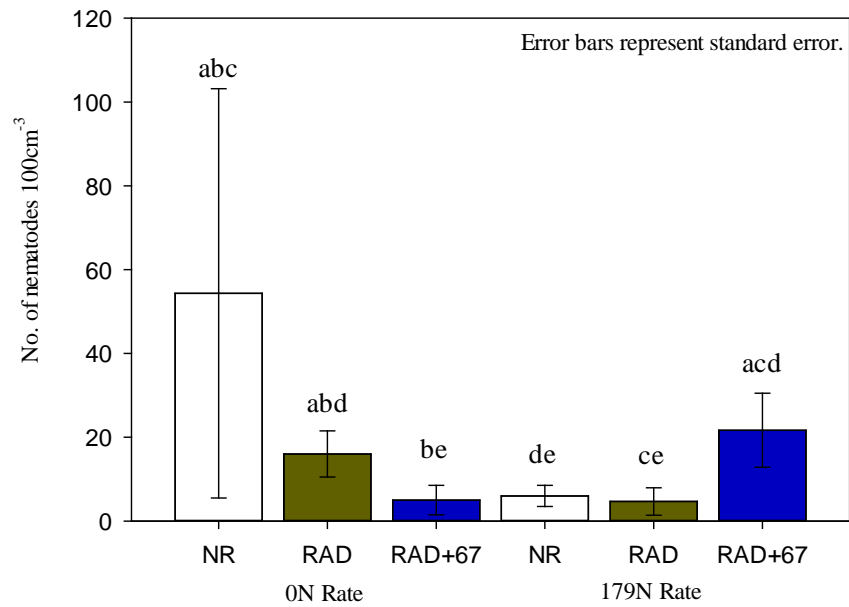


Figure 11. Root lesion nematode counts for Site 1 on 11 July 2013. Counts for each cover crop and N rate treatment were averaged across 4 reps. Different letters indicate statistically significant difference at $\alpha = 0.10$ level.

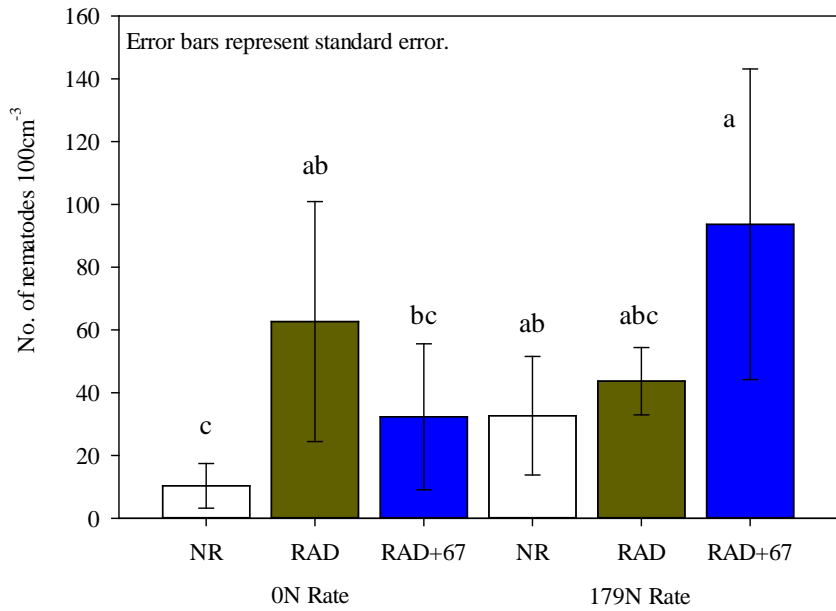


Figure 12. Root lesion nematode counts for Site 1 on 13 August 2013. Counts for each cover crop and N rate treatment were averaged across 4 reps. Different letters indicate statistically significant difference at $\alpha = 0.10$ level.

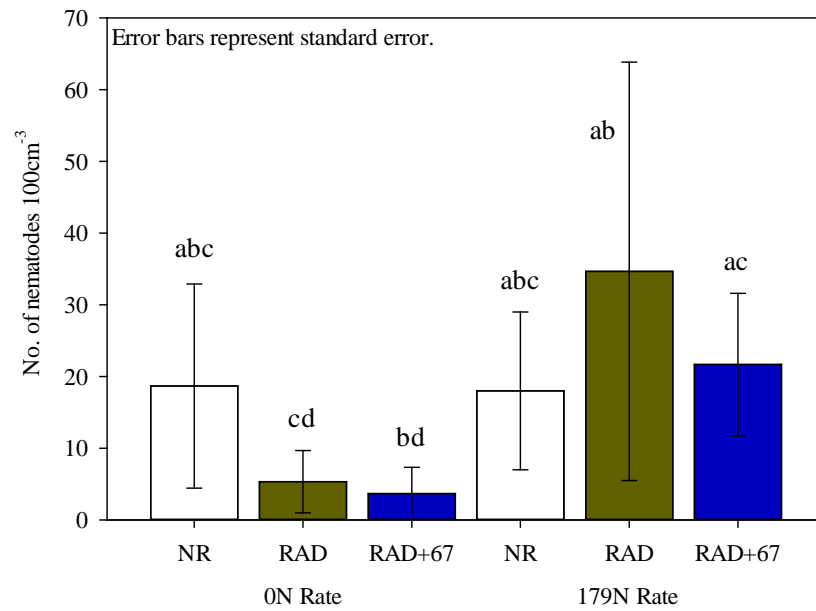


Figure 13. Root lesion nematode counts for Site 1 on 24 October 2013. Counts for each cover crop and N rate treatment were averaged across 4 reps. Different letters indicate statistically significant difference at $\alpha = 0.10$ level.

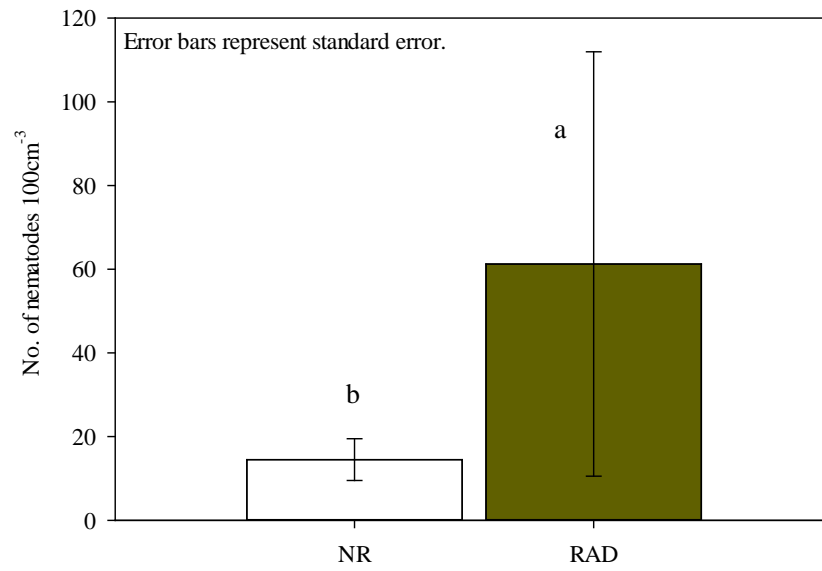


Figure 14. Root lesion nematode counts for Site 2 on 8 May 2013. Counts for each cover crop treatment were averaged across 4 reps. Different letters indicate statistically significant difference at $\alpha = 0.10$ level.

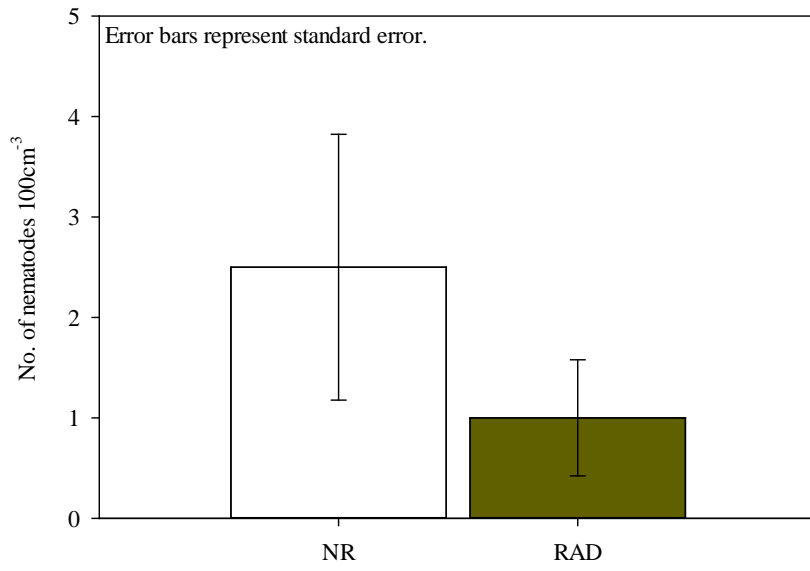


Figure 15. Root lesion nematode counts for Site 2 on 14 June 2013. Counts for each cover crop treatment were averaged across 4 reps.

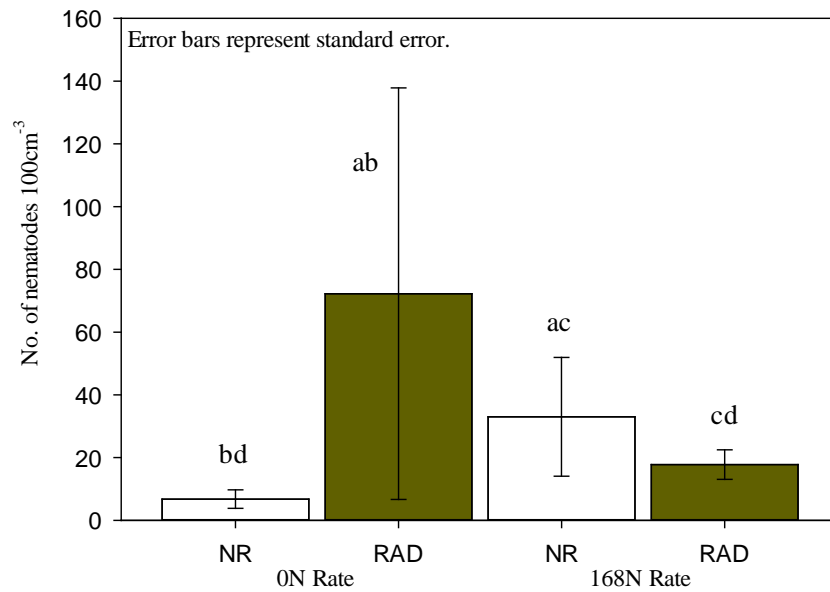


Figure 16. Root lesion nematode counts for Site 2 on 16 July 2013. Counts for each cover crop and N rate treatment were averaged across 4 reps. Different letters indicate statistically significant difference at $\alpha = 0.10$ level.

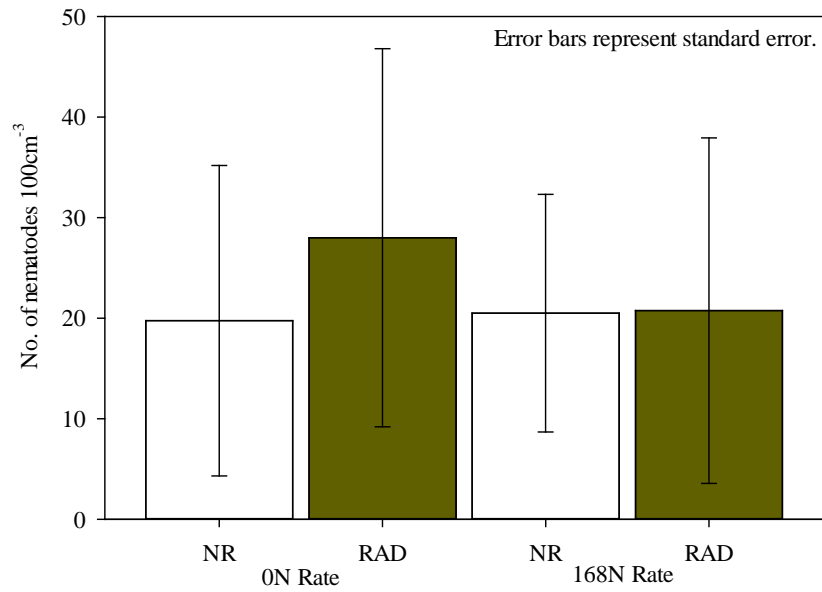


Figure 17. Root lesion nematode counts for Site 2 on 15 August 2013. Counts for each cover crop and N rate treatment were averaged across 4 reps.

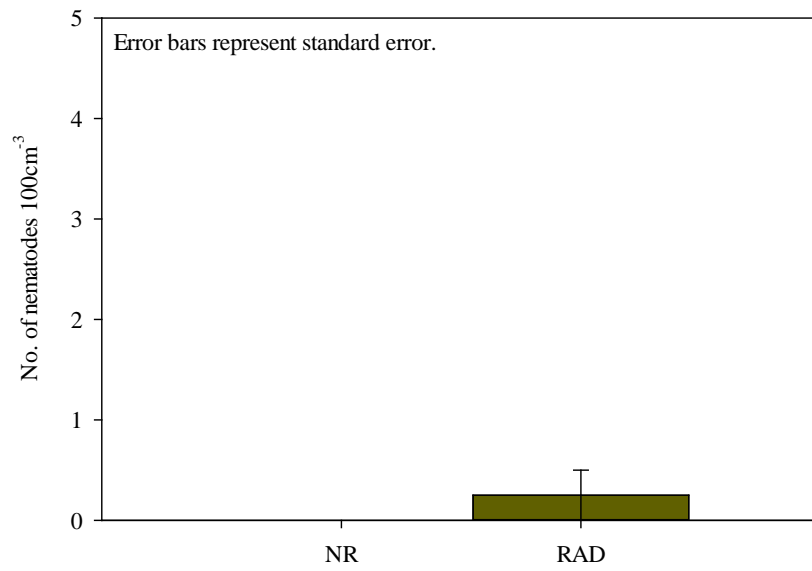


Figure 18. Root lesion nematode counts for Site 2 on 10 June 2014. Counts for each cover crop treatment were averaged across 4 reps.

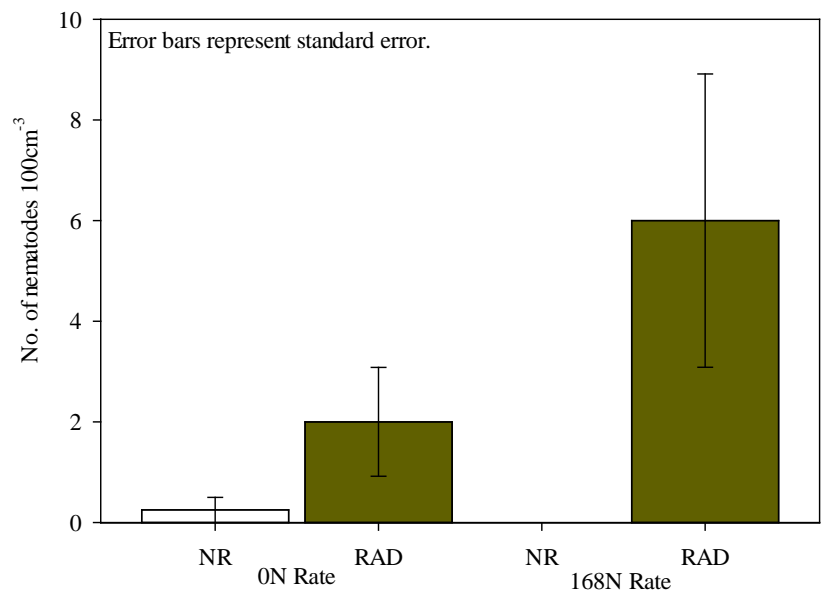


Figure 19. Root lesion nematode counts for Site 2 on 9 July 2014. Counts for each cover crop and N rate treatment were averaged across 4 reps.

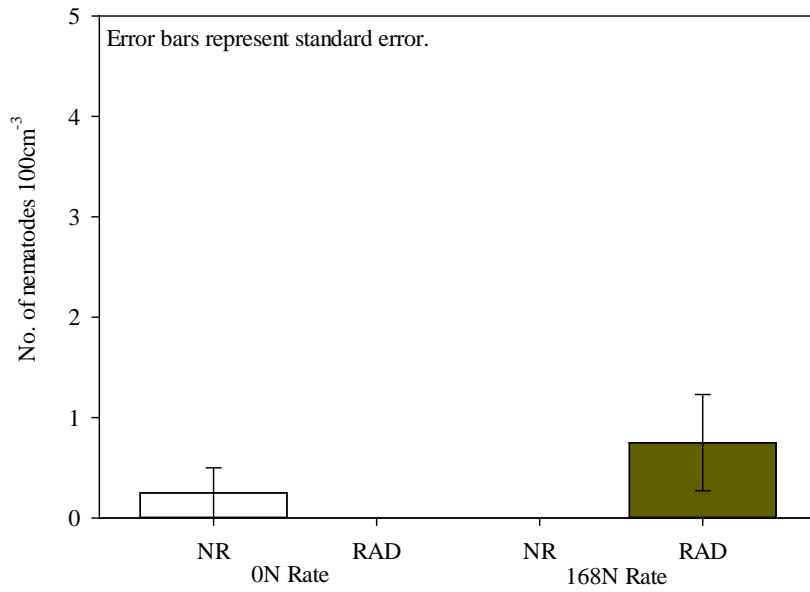


Figure 20. Root lesion nematode counts for Site 2 on 15 August 2014. Counts for each cover crop and N rate treatment were averaged across 4 reps.

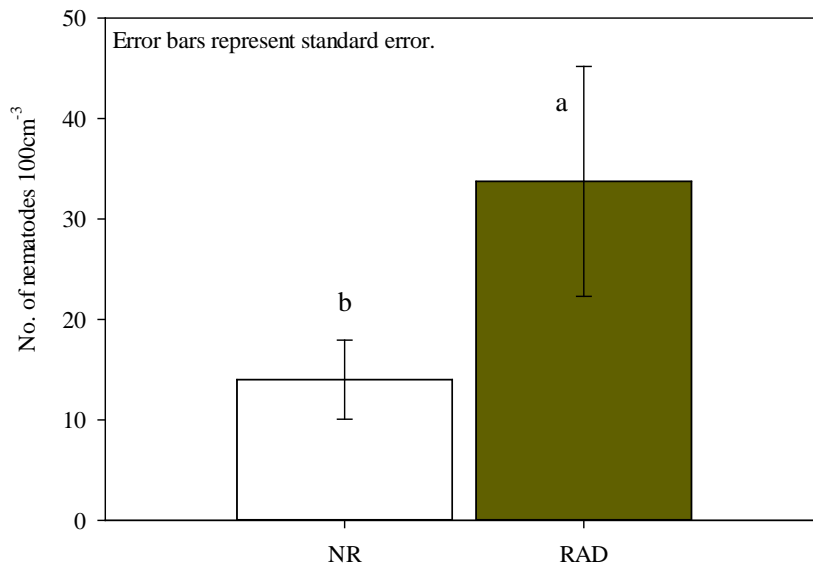


Figure 21. Root lesion nematode counts for Site 3 on 13 June 2014. Counts for each cover crop treatment were averaged across 4 reps. Different letters indicate statistically significant difference at $\alpha = 0.10$ level.

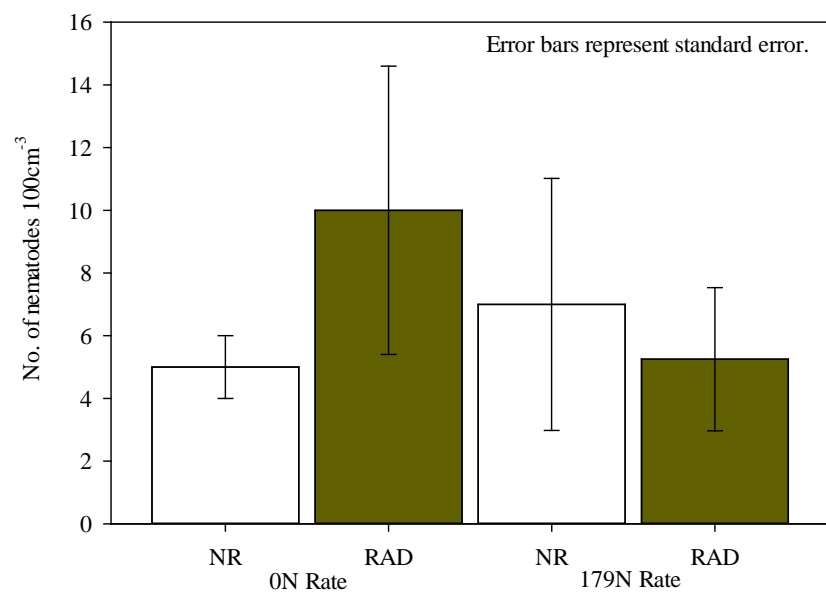


Figure 22. Root lesion nematode counts for Site 3 on 3 July 2014. Counts for each cover crop and N rate treatment were averaged across 4 reps.

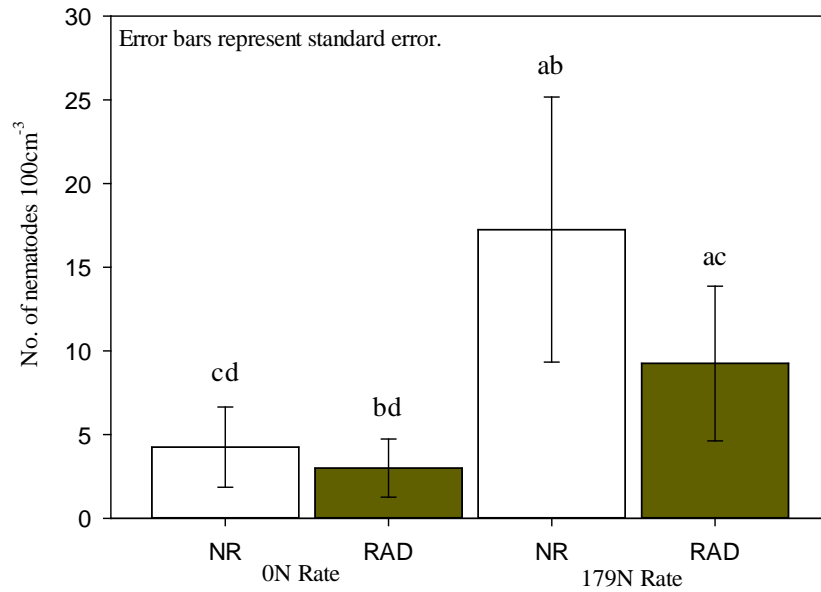


Figure 23. Root lesion nematode counts for Site 3 on 4 September 2014. Counts for each cover crop and N rate treatment were averaged across 4 reps. Different letters indicate statistically significant difference at $\alpha = 0.10$ level.

Table 8. Soybean cyst juvenile nematode counts for 2013. Counts for each cover crop treatment were averaged across 4 reps.

Site	Month	Treatment	N Rate	SCN [†]	SE [‡]	N Rate	SCN [†]	SE [‡]
1	14 May 2013	NR	0	0.75	0.25			
		RAD	0	0.25	0.25			
		RAD+67	0	0	0			
		P>F						
	11 July 2013	NR	0	0.67	0.67	179	0	0
		RAD	0	0.67	0.67	179	0.33	0.33
		RAD+67	0	0	0	179	0	0
		P>F						
	13 August 2013	NR	0	0	0	179	0	0
		RAD	0	0	0	179	0	0
		RAD+67	0	0	0	179	0.33	0.33
		P>F						
24 October 2013	NR	0	0	0	179	0	0	
	RAD	0	0	0	179	0	0	
	RAD+67	0	0	0	179	0.33	0.33	
	P>F							
2	8 May 2013	NR	0	2.25	2.25			
		RAD	0	1.75	1.75			
		P>F						
	14 June 2013	NR	0	1.25	0.63			
		RAD	0	1.25	0.63			
		P>F						
	16 July 2013	NR	0	0	0	168	0	0
		RAD	0	0	0	168	0.5	0.5
		P>F						
	15 August 2013	NR	0	0	0	168	0	0
		RAD	0	0	0	168	0.25	0.25
		P>F						

[†] SCN- averaged nematode counts for soybean cyst nematodes across 4 reps

[‡] SE- standard error of averaged nematode counts for soybean cyst nematodes across 4 reps

Table 9. Soybean cyst juvenile nematode counts for 2014. Counts for each cover crop treatment were averaged across 4 reps.

Site	Month	Treatment	N Rate	SCN†	SE‡	N Rate	SCN†	SE‡
2	10 June 2014	NR	0	0	0			
		RAD	0	0	0			
		P>F						
	9 July 2014	NR	0	0	0	168	0	0
		RAD	0	0	0	168	0	0
		P>F						
	15 August 2014	NR	0	0	0	168	0	0
		RAD	0	0	0	168	0	0
		P>F						
3	13 June 2014	NR	0	0	0			
		RAD	0	0	0			
		P>F						
	3 July 2014	NR	0	0	0	179	0	0
		RAD	0	0	0	179	0	0
		P>F						
	15 August 2014	NR	0	0	0	179	0	0
		RAD	0	0	0	179	0	0
		P>F						

† SCN- averaged nematode counts for soybean cyst nematodes across 4 reps

‡ SE- standard error of averaged nematode counts for soybean cyst nematodes across 4 reps