

Plant Family	Functional Type	Fallow	Grazing	Groundnut	Millet	F Value	P Value
All Plants							
%N		3.3 (0.8) (a)	3.5 (0.9) (a)	4.2 (1.2) (b)	3.5 (0.7) (a)	8.1	**0.004
%C		40.2 (4.2)	40.8 (3.9)	40.1 (4.1)	40.3 (3.4)	0.1	1.0
C:N Ratio		12.9 (3.2) (a)	12.5 (3.3) (a)	10.0 (2.2) (b)	12.0 (2.8) (a)	9.6	**0.002
Poaceae (millet only) Grass							
%N		4.5 (NA)	NP	NP	3.4 (0.7)	3.8	0.1
%C		34.7 (NA)			42.3 (2.1)	13.0	0.002
C:N Ratio		7.7 (NA)			13.2 (3.1)	3.5	0.1
Poaceae (excluding millet) Grass							
%N		3.4 (0.7)	3.5 (0.7)	3.4 (0.8)	3.3 (0.4)	0.3	0.9
%C		42.0 (2.0)	41.2 (3.6)	39.8 (0.8)	42.2 (2.7)	0.6	0.6
C:N Ratio		13.0 (2.7)	12.1 (2.6)	12.4 (4.4)	13.1 (2.0)	0.3	0.8
Fabaceae (groundnut only) Legume							
%N		NP	NP	4.9 (1.4)	4.1 (0.5)	0.2	0.7
%C				42.5 (2.6)	42.3 (0.2)	0.0	0.9
C:N Ratio				9.2 (2.4)	10.3 (1.1)	0.0	0.8
Fabaceae (excluding groundnut) Legume							
%N		3.4 (0.6)	3.4 (1.1)	4.3 (0.7)	2.7	2.1	0.2
%C		42.3 (1.1)	42.1 (0.9)	40.7 (0.7)	41.8	0.4	0.7
C:N Ratio		12.6 (2.1)	13.6 (4.0)	9.8 (2.2)	15.3	1.8	0.2
Combretaceae Shrub							
%N		3.3 (0.0)	4.5 (1.8)	3.6 (0.4)	NP	0.6	0.6
%C		47.0 (0.4)	43.2 (6.9)	46.1 (0.5)	NP	0.4	0.7
C:N Ratio		14.1 (0.3)	11.2 (6.6)	12.8 (1.7)	NP	0.2	0.8
Commelinaceae Forb							
%N		3.2 (0.2)	3.7 (0.6)	3.7 (0.7)	NP	3.8	*0.03
%C		39.4 (2.3)	37.1 (3.1)	37.4 (2.2)	NP	2.2	0.1
C:N Ratio		12.2 (0.5)	10.2 (1.7)	10.4 (2.4)	NP	5.5	**0.01
Convolvulaceae Forb							
%N		3.2 (0.7)	3.1 (1.0)	3.6 (0.2)	3.7 (0.7)	1.7	0.2
%C		35.9 (3.8)	35.5 (3.8)	36.7 (2.8)	37.1 (3.2)	0.4	0.8
C:N Ratio		11.7 (3.0)	12.6 (4.4)	10.3 (0.8)	10.3 (2.1)	1.3	0.3
Cyperaceae Sedge							
%N		2.4 (0.3)	NP	3.2 (0.1)	2.9 (0.3)	11.4	*0.04
%C		43.6 (2.0)		43.1 (0.8)	43.4 (2.0)	0.0	1.0
C:N Ratio		18.6 (2.0)		13.7 (0.8)	14.9 (2.0)	6.5	0.1
Malvaceae Forb							
%N		6.1	NP	NP	NP		
%C		42.4					
C:N Ratio		6.9					
Rubiaceae Forb							
%N		2.6 (1.1)	3.5 (0.2)	3.4 (0.1)	3.1 (0.4)	34.3	**0.01
%C		35.1 (5.2)	37.2 (4.0)	32.2 (2.8)	35.4 (4.3)	0.2	0.9
C:N Ratio		14.7 (5.2)	10.8 (0.7)	9.5 (1.2)	11.4 (0.1)	43.1	0.0
Unknown forb sprout Forb							
%N				3.8 (0.1)	3.4		
%C		NP	NP	40.4 (0.0)	41.9		
C:N Ratio				10.8 (0.4)	12.2		

Supplemental Table 1: Plant nutrient variation by plant family across land use type; values indicate mean (SE). Letters show post hoc significant differences from Tukey HSD comparisons following ANOVAs. Not present in field (NP).

Supplemental Table 2: Correlation between grasshopper species, plant N content and plant C:N ratio. Spearman's rank correlation tests were used for all species besides *O. senegalensis* where we used a Pearson's correlation test.

Species	Feeder	Plant N (p-value)	Plant N r R²	Plant C:N (p-value)	Plant C:N r
<i>Acorypha</i> spp	Mixed	1	0	1	0
<i>Acrida bicolor</i>	Mixed/ Graminivorous	0.4	-0.2	0.2	0.4
<i>Acrotylus</i> spp	Mixed	0.005**	-0.9	0.008**	0.8
<i>Catantops stramineus</i>	Mixed	Insufficient n			
<i>Chrotogonus senegalensis</i>	Mixed	0.9	-0.04	0.7	0.1
<i>Cryptocatantops haemorrhoidalis</i>	Mixed/Non- Graminivorous	Insufficient n	-	-	-
<i>Diabolocatantops axillaris</i>	Mixed	Insufficient n	-	-	-
<i>Oedaleus senegalensis</i>	Graminivorous	0.045*	-0.4	0.003**	0.6
<i>Ornithacris cavroisi</i>	Mixed	Insufficient n	-	-	-
<i>Pyrgomorpha cognata</i>	Mixed	Insufficient n	-	-	-
<i>Unknown nymph</i>	NA	Insufficient n	-	-	-

Appendix A. Results of mixed linear regression model selection

Model Table 1:				
<i>Soil Variable Models</i>	AIC	AICc	dAICc	Weight [AICc]
TotalN ~ SOM + BD + pH + Soil Moisture + EC + Dung Cover + Rock Cover)	115.27	129.02	3.55	0.14
TotalN ~ Live Vegetation Cover + BD + pH + Soil Moisture + EC + Dung Cover + Rock Cover)	117.59	131.34	5.88	0.04
TotalN ~ SOM + BD + pH + Soil Moisture + Dung Cover + Rock Cover)	133.42	144.00	18.19	0
TotalN ~ SOM + BD + EC + pH + Dung Cover + Rock Cover)	114.88	125.47	0	0.82
TotalN ~ SOM + BD + pH + Soil Moisture + Dung Cover)	135.66	143.66	18.19	0

Model Table 2:				
<i>Farmer Management Variable Models</i>	AIC	AICc	dAICc	Weight [AICc]
TotalN~ ResRemoved + Fertilizer Use + Years Groundnut + Years Fallow + Years Millet + Years Beans + Cover Crop)	75.26	111.93	7.64	0.01
TotalN~ ResRemoved + Fertilizer Use + Years Groundnut + Years Fallow +Years Millet + Cover Crop)	82.91	108.62	4.33	0.06
TotalN~ ResRemoved + Fertilizer Use + Years Groundnut + Years Fallow + Years Millet + Years Beans)	78.58	104.29	0.00	0.48
TotalN~ ResRemoved + Fertilizer Use + Years Fallow + Years Millet + Cover Crop)	87.56	105.56	1.28	0.26
TotalN~ ResRemoved + Fertilizer Use + Years Groundnut + Years Fallow + Years Beans + Cover Crop)	80.41	106.12	1.83	0.19

Model Table 3:				
<i>Plant Soil Variable Models</i>	AIC	AICc	dAICc	Weight [AICc]
Non-N fixing Plant N ~ Soil Total N + Crop Type + Dung Cover + Litter Cover)	-10.88	-9.80	14.61	0.00
Non-N fixing Plant N ~ Soil Total N + Dung Cover + Litter Cover)	-24.90	-24.41	0.00	0.53
Non-N fixing Plant N ~ Soil Total N + Dung Cover + Crop Type)	-17.45	-16.59	7.82	0.01
Non-N fixing Plant N ~ Soil Total N + Crop Type + Litter Cover)	-18.19	-17.33	7.08	0.02
Non-N fixing Plant N ~ Soil Total N + Crop Type)	-24.72	-24.06	0.35	0.44

Model Table 4:				
<i>Locust Plant Soil Variable Models</i>	AIC	AICc	dAICc	Weight [AICc]
O. senegalensis Abundance ~ Plant Species N + Soil Total N + Live Vegetation Cover + rock + dung + litter + Crop + Years Fallow)	82.06	115.15	15.81	0.00
O. senegalensis Abundance ~ Plant Species N + Soil Total N + Live Vegetation Cover + rock + dung + litter + Crop)	78.03	104.03	4.68	0.09
O. senegalensis Abundance ~ Plant Species N + Soil Total N + Live Vegetation Cover + rock + dung + litter + Years Fallow)	83.63	99.34	0.00	0.89
O. senegalensis Abundance ~ Plant Species N + Soil Total N + rock + dung + litter + Crop + Years Fallow)	85.74	111.74	12.39	0.00
O. senegalensis Abundance ~ Plant Species N + Soil Total N + Live Vegetation Cover + rock + dung + Crop + Years Fallow)	81.15	107.15	7.81	0.02