

Supplementary Table 1. Daily variation in measured values of soil respiration at the warm grazing site from May 2010 to December 2011 with different grazing intensities.

Year	Month	GI (sheep ha ⁻¹)	Rs ($\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$)		Daily Total C efflux ($\text{g CO}_2 \text{ m}^{-2} \text{ d}^{-1}$)			
			Maximum	time	Minimum	time	Average \pm SE	
2010	May	0	0.90	10:00	0.48	6:00	0.75 \pm 0.06	0.77
		2.7	0.86	10:00	0.49	6:00	0.67 \pm 0.04	0.69
		5.3	1.02	10:00	0.41	6:00	0.69 \pm 0.06	0.72
		8.7	0.82	10:00	0.39	6:00	0.63 \pm 0.03	0.65
	Sep	0	1.69	14:00	0.60	22:00	1.16 \pm 0.05	1.20
		2.7	1.38	14:00	0.54	22:00	0.99 \pm 0.08	1.03
		5.3	1.41	14:00	0.49	22:00	0.91 \pm 0.09	0.94
		8.7	1.62	12:00	0.45	22:00	1.04 \pm 0.09	1.08
	Dec	0	0.32	14:00	0.16	6:00	0.25 \pm 0.04	0.26
		2.7	0.37	14:00	0.23	6:00	0.28 \pm 0.04	0.29
		5.3	0.25	14:00	0.17	6:00	0.22 \pm 0.03	0.23
		8.7	0.360	14:00	0.099	6:00	0.23 \pm 0.08	0.24
2011	May	0	0.55	10:00	0.31	22:00	0.42 \pm 0.05	0.44
		2.7	0.68	10:00	0.30	6:00	0.44 \pm 0.04	0.46
		5.3	0.58	10:00	0.21	6:00	0.39 \pm 0.04	0.40
		8.7	0.58	10:00	0.15	6:00	0.35 \pm 0.03	0.36
	Sep	0	1.69	16:00	1.02	22:00	1.35 \pm 0.08	1.40
		2.7	1.84	16:00	0.81	6:00	1.34 \pm 0.09	1.39
		5.3	1.58	14:00	0.69	6:00	1.16 \pm 0.09	1.20
		8.7	1.62	16:00	0.78	6:00	1.14 \pm 0.06	1.18
Dec	0	0.30	14:00	0.16	6:00	0.24 \pm 0.04	0.25	
	2.7	0.22	14:00	0.084	6:00	0.16 \pm 0.04	0.16	
	5.3	0.34	14:00	0.185	6:00	0.24 \pm 0.05	0.25	
	8.7	0.27	14:00	0.16	6:00	0.22 \pm 0.03	0.22	

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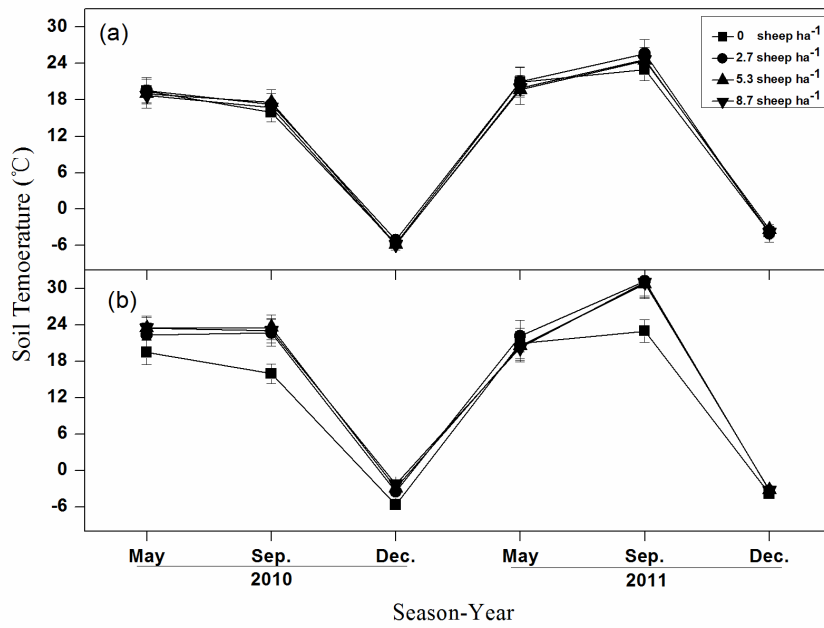
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Supplementary Table 2. Daily variation in measured values of soil respiration at the cold grazing site from May 2010 to December 2011 with different grazing intensities.

Year	Season	GI (sheep ha ⁻¹)	Rs ($\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$)				Average \pm SE	Daily Total C efflux (g CO ₂ m ⁻² d ⁻¹)
			Maximum	time	Minimum	time		
2010	May	0	0.90	10:00	0.48	6:00	0.75 \pm 0.06	0.77
		2.7	2.17	16:00	1.35	22:00	1.74 \pm 0.08	1.81
		5.3	1.90	16:00	1.27	6:00	1.71 \pm 0.05	1.78
		8.7	1.87	16:00	1.13	6:00	1.60 \pm 0.05	1.66
	Sep	0	1.69	14:00	0.60	22:00	1.16 \pm 0.11	1.20
		2.7	1.86	14:00	1.23	6:00	1.53 \pm 0.05	1.59
		5.3	2.11	16:00	1.18	22:00	1.63 \pm 0.06	1.69
		8.7	2.02	14:00	1.07	6:00	1.55 \pm 0.09	1.61
	Dec	0	0.32	14:00	0.16	6:00	0.25 \pm 0.04	0.26
		2.7	0.46	14:00	0.34	6:00	0.39 \pm 0.04	0.41
		5.3	0.38	14:00	0.30	6:00	0.34 \pm 0.02	0.35
		8.7	0.37	14:00	0.26	6:00	0.33 \pm 0.03	0.34
2011	May	0	0.55	10:00	0.31	22:00	0.42 \pm 0.05	0.43
		2.7	0.69	16:00	0.31	6:00	0.45 \pm 0.03	0.47
		5.3	0.61	10:00	0.23	22:00	0.44 \pm 0.03	0.46
		8.7	0.61	10:00	0.25	6:00	0.42 \pm 0.03	0.44
	Sep	0	1.69	16:00	1.02	22:00	1.35 \pm 0.08	1.40
		2.7	1.02	16:00	0.72	6:00	0.89 \pm 0.03	0.93
		5.3	1.01	10:00	0.77	6:00	0.89 \pm 0.03	0.92
		8.7	0.95	10:00	0.68	22:00	0.81 \pm 0.03	0.84
	Dec	0	0.30	14:00	0.16	6:00	0.24 \pm 0.04	0.25
		2.7	0.28	14:00	0.19	6:00	0.25 \pm 0.03	0.26
		5.3	0.34	14:00	0.17	6:00	0.25 \pm 0.05	0.26
		8.7	0.23	14:00	0.18	6:00	0.21 \pm 0.02	0.21

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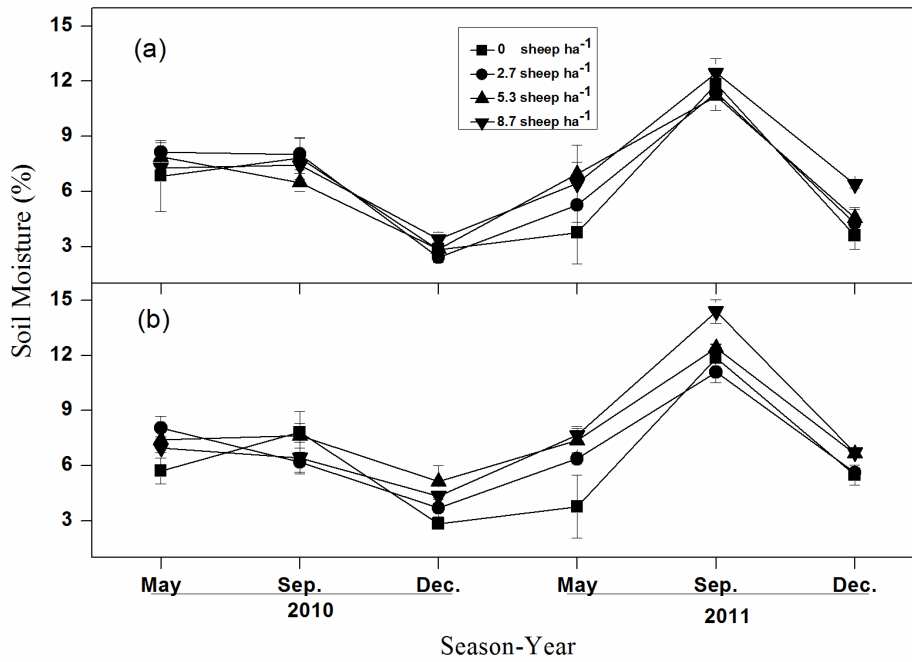


Supplementary Figure 1 Seasonal dynamics of soil temperature(a) in warm season grazing plots; (b) in cold season grazing plots; Vertical bars represent the standard error of the measurement mean (n=9) for each observation date.

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Supplementary Figure 2 Seasonal dynamics of soil moisture (a) in warm season grazing plots; (b) in cold season grazing plots; Vertical bars represent the standard error of the measurement mean (n=3) for each observation date.

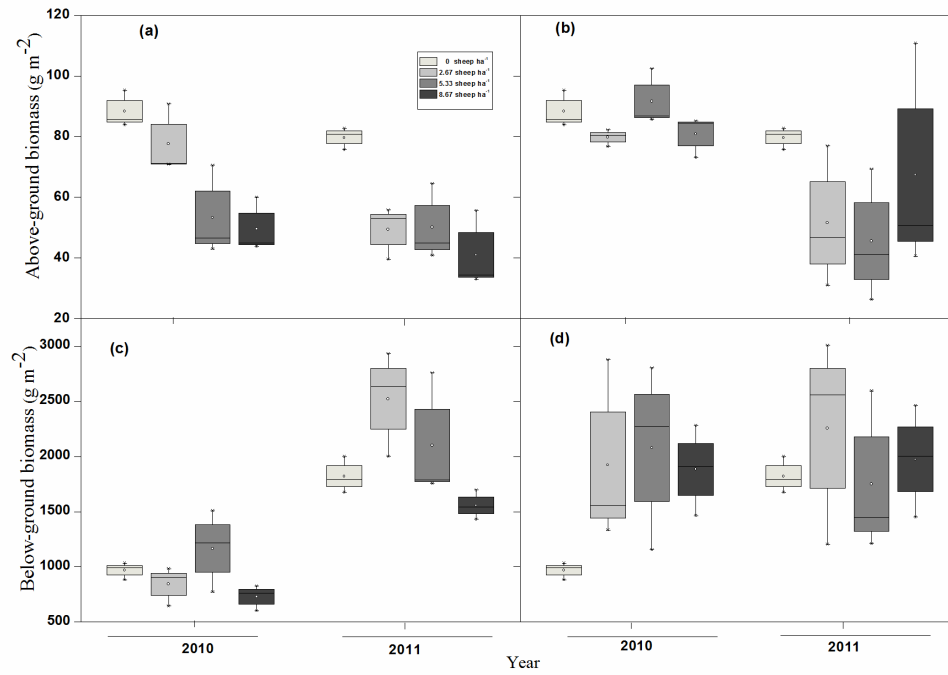
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Supplementary Figure 3. Aboveground biomass within (a) warm season grazing plots; (b) cold season grazing plots; belowground biomass within (c) warm season grazing plots; (d) cold season grazing plots from 2010 to 2011. Horizontal lines in boxes show medians and dashed whiskers show data extremes. Open circles and solid whiskers show means \pm propagated standard errors.

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