

Article

Subsurface drip irrigation with emitters placement at suitable depth can mitigate N₂O emissions and enhance Chinese cabbage yield under greenhouse cultivation

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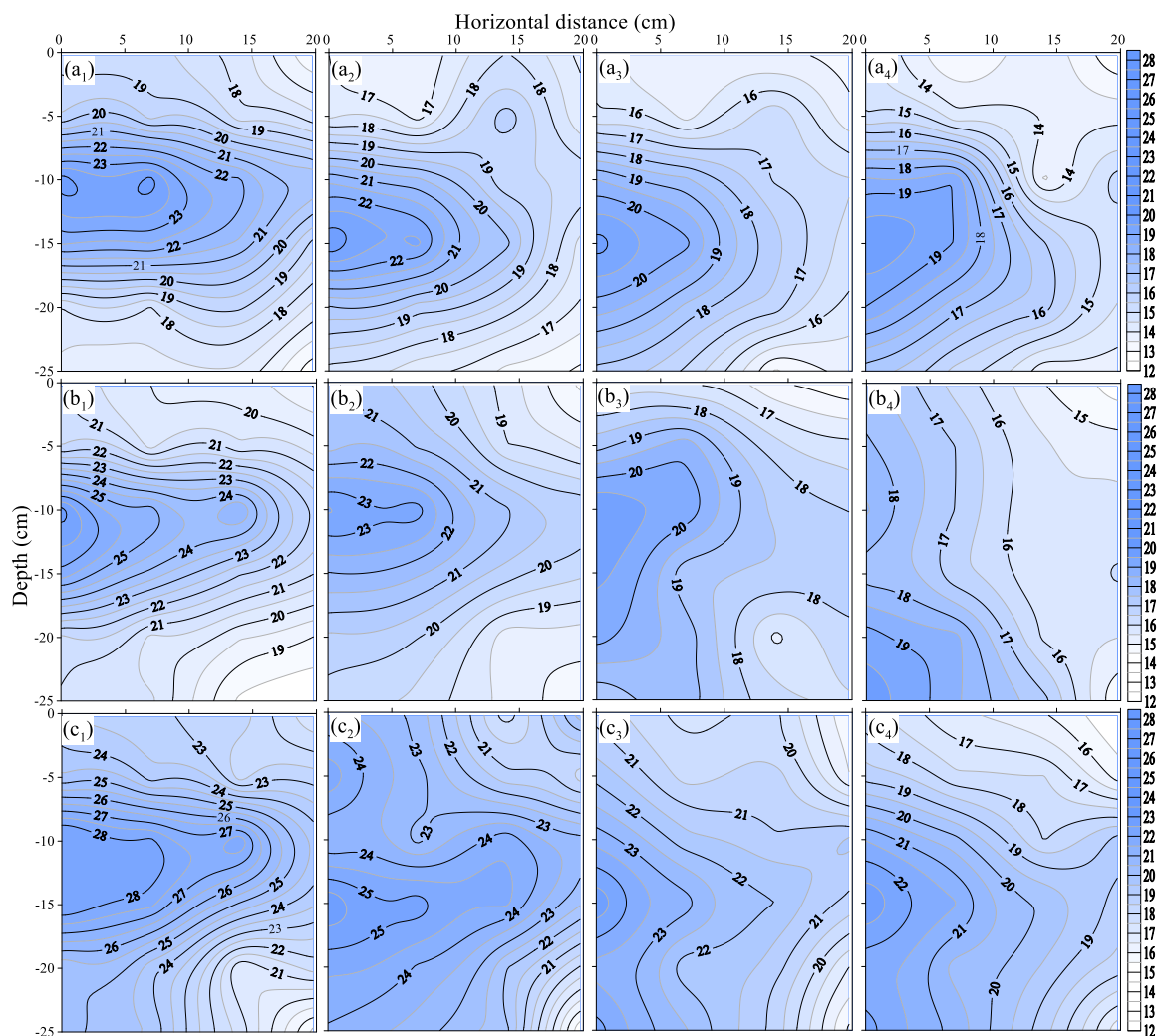


Figure S1. Soil moisture distribution under SDI₁₀+N₃₀₀ treatment. letters a, b, and c represent first, second, and third irrigation events. The subscript numbers 1, 2, 3, and 4 denote sampling times of soil moisture subsequent to each irrigation.

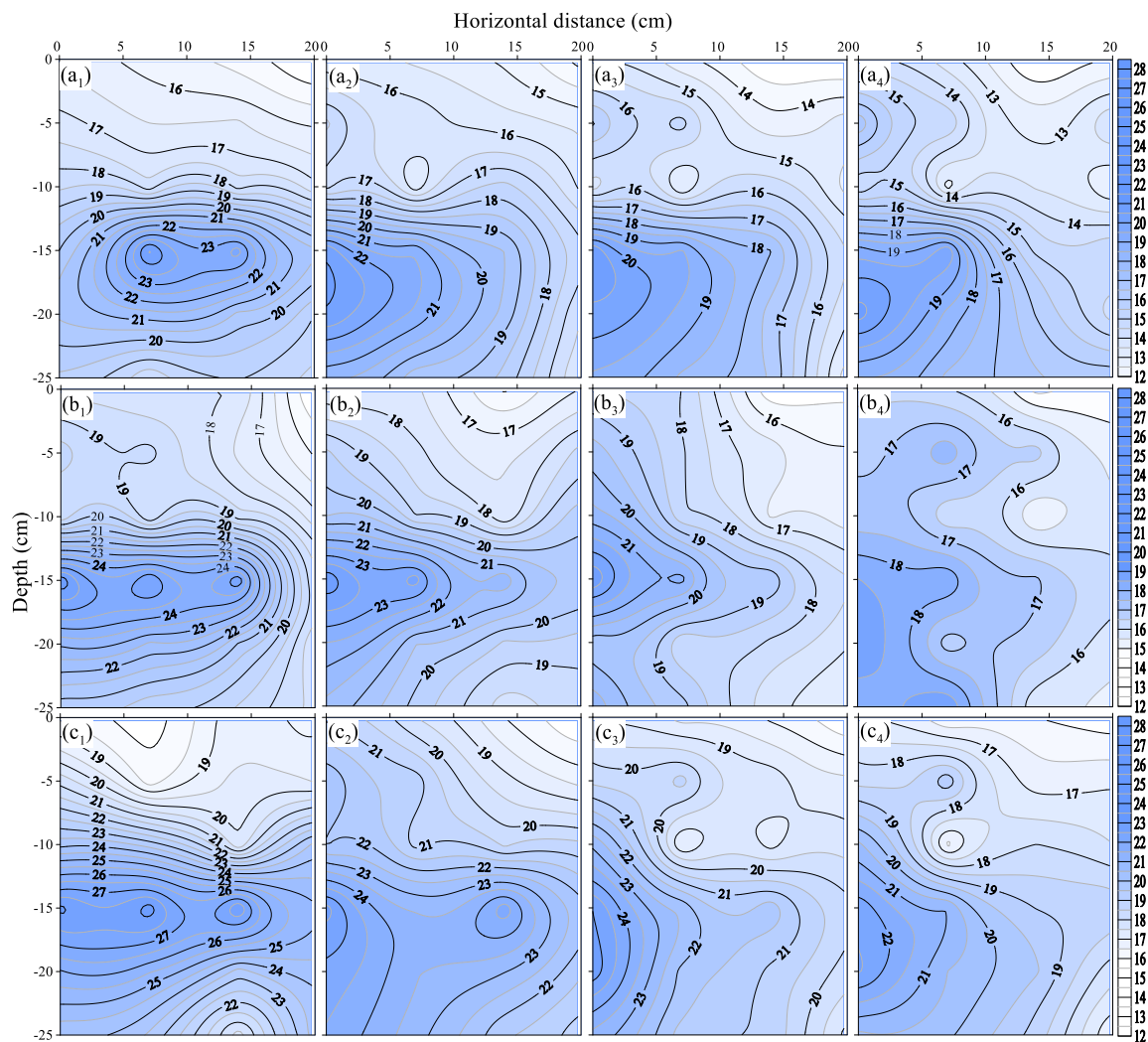


Figure S2. Soil moisture distribution under SDI₁₅+N₃₀₀ treatment. letters a, b, and c represent first, second, and third irrigation events. The subscript numbers 1, 2, 3, and 4 denote sampling times of soil moisture within each irrigation.

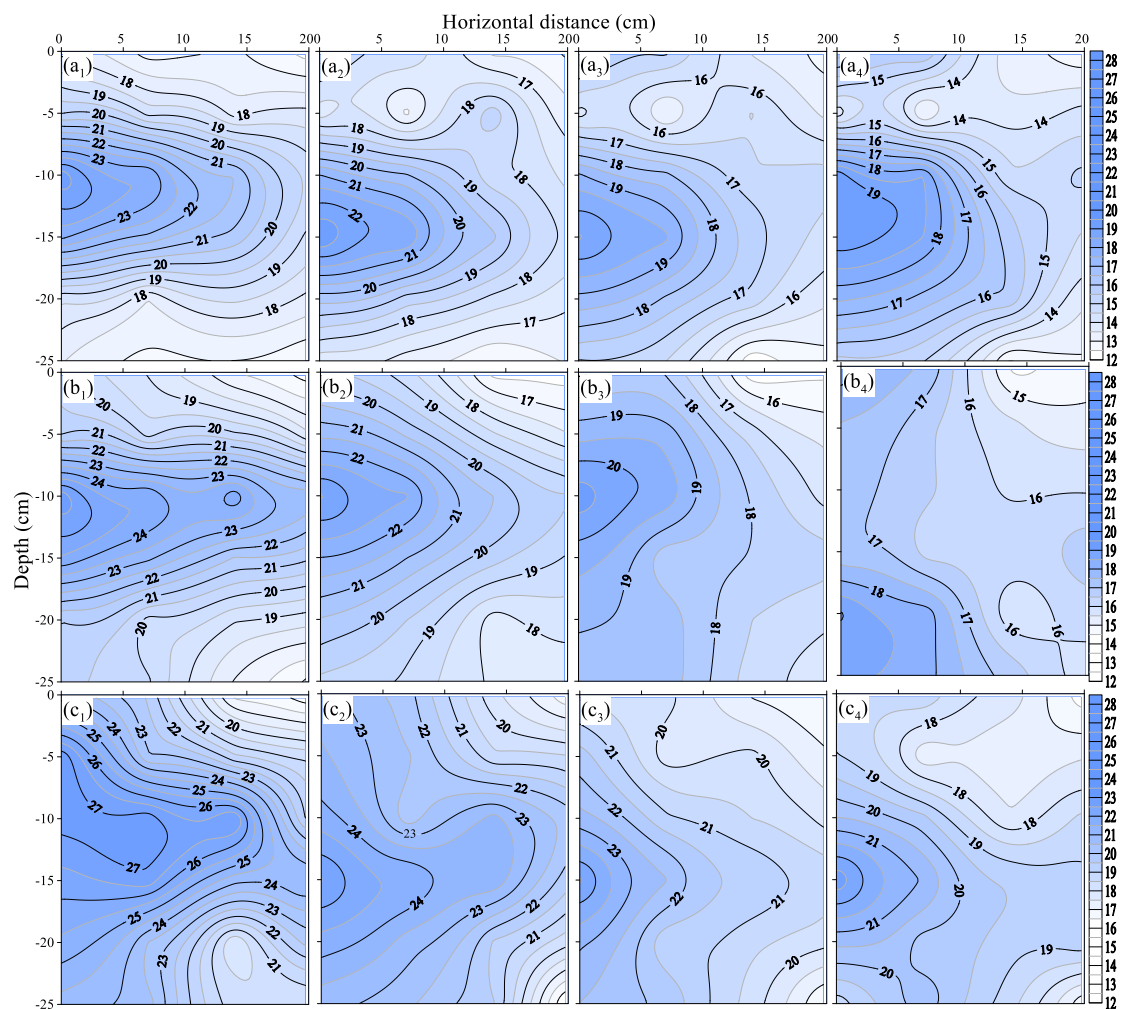


Figure S3. Soil moisture distribution under SDI₁₀+N₂₄₀ treatment. letters a, b, and c represent first, second, and third irrigation events. The subscript numbers 1, 2, 3, and 4 denote sampling times of soil moisture subsequent to each irrigation.

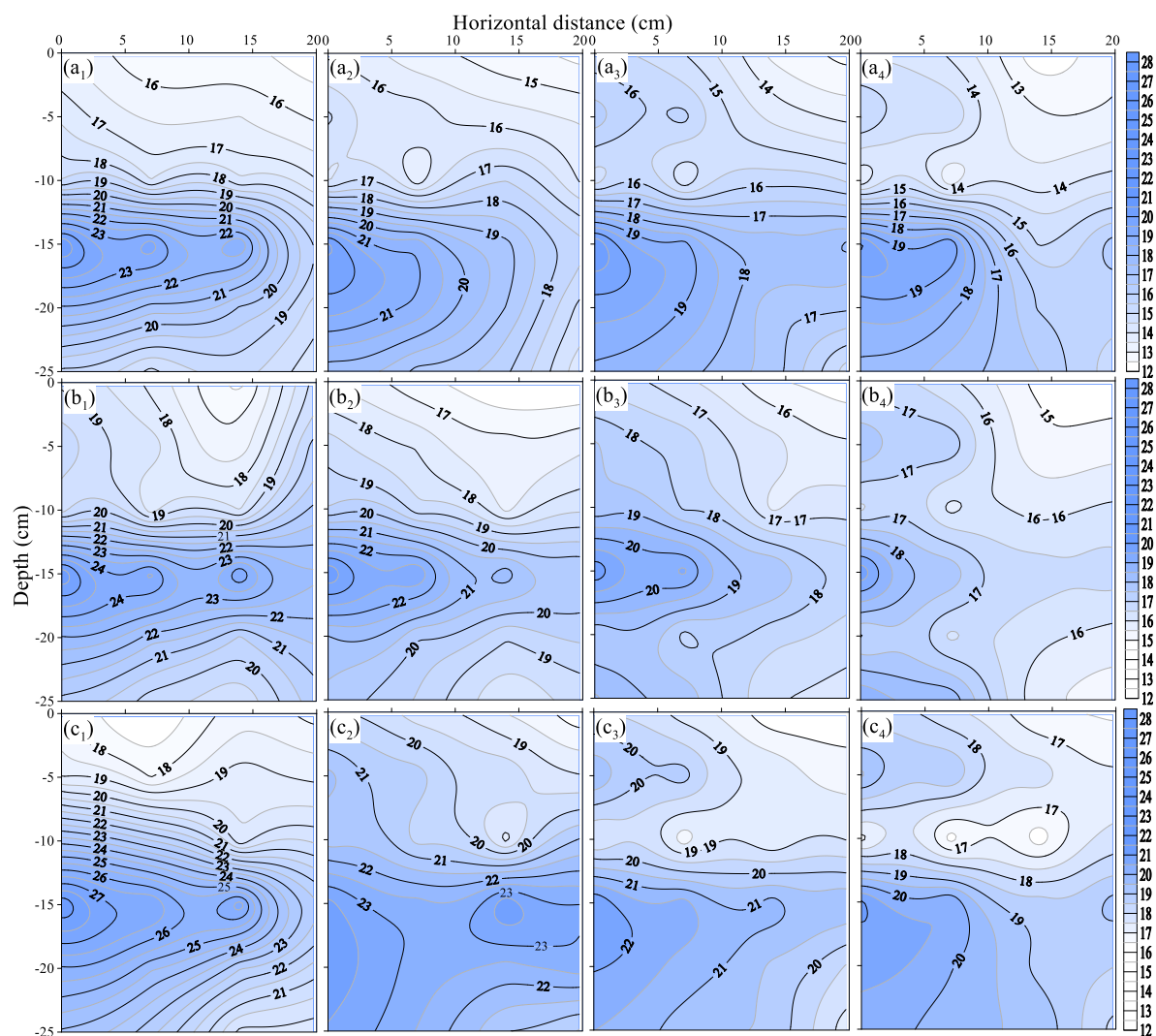


Figure S4. Soil moisture distribution under SDI₁₅+N₂₄₀ treatment. letters a, b, and c represent first, second, and third irrigation events. The subscript numbers 1, 2, 3, and 4 denote sampling times of soil moisture within each irrigation.

Table S1 Soil average \pm standard deviation of WFPS% for SDI₅ treatments.

Treatment	Irrigation event	Horizontal distance (m)			
		0.07	0.14	0.20	
SDI ₅ +N ₃₀₀	1 st	1 st	20.6±0.9 ^{Aa}	19.8±0.9 ^{Aa}	20.0±0.9 ^{Aa}
		2 nd	20.1±0.9 ^{Aab}	18.8±0.8 ^{Ba}	18.5±0.8 ^{Bb}
		3 rd	18.8±0.8 ^{Abc}	17.2±0.7 ^{ABa}	17.2±0.7 ^{Bc}
		4 th	17.1±0.7 ^{Ac}	15.1±0.7 ^{Bb}	15.5±0.7 ^{Bd}
	2 nd	1 st	23.0±1.0 ^{Ba}	22.2±1.0 ^{Ca}	26.2±1.1 ^{Aa}
		2 nd	21.9±0.9 ^{Bb}	20.4±0.9 ^{Bb}	23.0±1.0 ^{Ab}
		3 rd	20.4±0.9 ^{Ab}	18.7±0.8 ^{Bc}	20.5±0.9 ^{Ac}
		4 th	18.4±0.8 ^{Ac}	16.7±0.7 ^{Bd}	18.7±0.8 ^{Ad}
	3 rd	1 st	27.4±1.2 ^{Ba}	25.3±1.1 ^{Ca}	28.2±1.2 ^{Aa}
		2 nd	25.0±1.1 ^{Ab}	24.4±1.1 ^{Aa}	25.8±1.1 ^{Ab}
		3 rd	23.4±1.0 ^{Ac}	22.0±1.0 ^{Bb}	24.1±1.0 ^{Ac}
		4 th	21.8±0.9 ^{Ad}	19.8±0.9 ^{Bc}	22.5±1.0 ^{Ad}
SDI ₅ +N ₂₄₀	1 st	1 st	20.3±0.9 ^{Aa}	19.6±0.8 ^{Aa}	19.8±0.8 ^{Aa}
		2 nd	19.9±0.8 ^{Ab}	18.8±0.8 ^{Ab}	18.6±0.8 ^{Aa}
		3 rd	18.8±0.8 ^{Ab}	17.5±0.7 ^{ABb}	17.5±0.7 ^{Bb}
		4 th	17.4±0.7 ^{Ac}	15.8±0.7 ^{Bc}	16.1±0.7 ^{ABb}
	2 nd	1 st	22.2±0.9 ^{Ba}	21.6±0.9 ^{Ca}	24.8±1.0 ^{Aa}
		2 nd	21.3±0.9 ^{Ab}	21.1±0.8 ^{Aa}	22.2±0.9 ^{Ab}
		3 rd	20.1±0.9 ^{Ac}	18.7±0.8 ^{Bb}	20.2±0.9 ^{Ab}
		4 th	18.5±0.8 ^{Ad}	17.1±0.7 ^{Ab}	18.7±0.8 ^{Ac}
	3 rd	1 st	25.8±1.1 ^{Aa}	24.1±1.0 ^{Aa}	26.4±1.1 ^{Aa}
		2 nd	23.8±1.0 ^{Ab}	23.3±1.0 ^{Aa}	24.5±1.0 ^{Aab}
		3 rd	22.6±1.0 ^{Ab}	21.4±0.9 ^{Ab}	23.1±1.0 ^{Ab}
		4 th	21.2±0.9 ^{Ac}	19.6±0.8 ^{Bb}	21.8±0.9 ^{Ac}

Means of different uppercase letters (rows) indicate a significant difference at ($p < 0.05$) according to LSD test of soil moisture among three horizontal distances (0.07, 0.14, and 0.20 m), while lowercase (columns) indicates a significant difference of soil moisture in four sampling times within each irrigation events (1st, 2nd, 3rd, and 4th) within each irrigation event. SDI₅+N₃₀₀ and SDI₅+N₂₄₀ are not significantly different.

Table S2 Soil average \pm standard deviation of WFPS% for SDI₁₀ treatments.

Treatment	Irrigation	Sampling	Horizontal distance (m)		
			0.07	0.14	0.20
SDI ₁₀ +N ₃₀₀	1 st	1 st	19.6 \pm 0.8 ^{Aa}	18.8 \pm 0.8 ^{Aa}	19.0 \pm 0.8 ^{Aa}
		2 nd	19.2 \pm 0.8 ^{Aa}	17.9 \pm 0.8 ^{Bb}	17.7 \pm 0.8 ^{Ba}
		3 rd	17.9 \pm 0.8 ^{Ab}	16.4 \pm 0.7 ^{ABb}	16.4 \pm 0.7 ^{Bb}
		4 th	16.3 \pm 0.7 ^{Ab}	14.5 \pm 0.6 ^{Bc}	14.8 \pm 0.6 ^{Bb}
	2 nd	1 st	21.9 \pm 0.9 ^{Ba}	21.1 \pm 0.9 ^{Ba}	24.9 \pm 1.1 ^{Aa}
		2 nd	20.8 \pm 0.9 ^{Aab}	19.4 \pm 0.8 ^{Aab}	21.8 \pm 0.9 ^{Ab}
		3 rd	19.5 \pm 0.8 ^{Ab}	17.8 \pm 0.8 ^{Abc}	19.5 \pm 0.8 ^{Ac}
		4 th	17.6 \pm 0.8 ^{Ac}	15.9 \pm 0.7 ^{ABc}	17.8 \pm 0.8 ^{Ad}
	3 rd	1 st	26.0 \pm 1.1 ^{Aa}	24.0 \pm 1.0 ^{Aa}	26.8 \pm 1.2 ^{Aa}
		2 nd	23.8 \pm 1.0 ^{ABb}	23.2 \pm 1.0 ^{Ba}	24.5 \pm 1.1 ^{Aa}
		3 rd	22.3 \pm 1.0 ^{Ab}	21.0 \pm 0.9 ^{Bb}	22.9 \pm 1.0 ^{ABb}
		4 th	20.7 \pm 0.9 ^{Ac}	18.9 \pm 0.8 ^{Bb}	21.4 \pm 0.9 ^{Ab}
SDI ₁₀ +N ₂₄₀	1 st	1 st	19.7 \pm 0.8 ^{Aa}	19.1 \pm 0.8 ^{Aa}	18.6 \pm 0.8 ^{Aa}
		2 nd	18.8 \pm 0.8 ^{Aab}	18.1 \pm 0.8 ^{Aa}	17.3 \pm 0.7 ^{Aa}
		3 rd	17.4 \pm 0.7 ^{Aab}	16.2 \pm 0.7 ^{Ab}	16.0 \pm 0.7 ^{Aa}
		4 th	16.4 \pm 0.7 ^{Ab}	14.2 \pm 0.6 ^{Bc}	14.5 \pm 0.6 ^{Bb}
	2 nd	1 st	21.5 \pm 0.9 ^{Ba}	20.6 \pm 0.9 ^{Ba}	24.1 \pm 1.0 ^{Aa}
		2 nd	20.5 \pm 0.9 ^{Aa}	18.9 \pm 0.8 ^{Bb}	21.6 \pm 0.9 ^{Aa}
		3 rd	19.0 \pm 0.8 ^{Ab}	17.4 \pm 0.7 ^{Ab}	19.0 \pm 0.8 ^{Ab}
		4 th	17.2 \pm 0.7 ^{ABb}	15.6 \pm 0.7 ^{Bc}	17.4 \pm 0.7 ^{Ab}
	3 rd	1 st	24.9 \pm 1.1 ^{ABa}	22.7 \pm 1.0 ^{Ba}	26.0 \pm 1.1 ^{Aa}
		2 nd	23.0 \pm 1.0 ^{Aab}	22.2 \pm 0.9 ^{Aa}	24.0 \pm 1.0 ^{Aa}
		3 rd	21.3 \pm 0.9 ^{Aab}	20.6 \pm 0.9 ^{Aab}	22.1 \pm 0.9 ^{Ab}
		4 th	19.6 \pm 0.8 ^{Ab}	18.4 \pm 0.8 ^{Ab}	22.2 \pm 0.9 ^{Ab}

Means of different uppercase letters (rows) indicate a significant difference at ($p < 0.05$) according to LSD test of soil moisture among three horizontal distances (0.07, 0.14, and 0.20 m), while lowercase (columns) indicates a significant difference of soil moisture in four sampling times within each irrigation events (1st, 2nd, 3rd, and 4th) within each irrigation event. SDI₁₀+N₃₀₀ and SDI₁₀+N₂₄₀ are not significantly different.

Table S3 Soil average \pm standard deviation of WFPS% for SDI₁₅ treatments.

Treatment	Irrigation	Sampling	Horizontal distance (m)												
			0.07	0.14	0.20										
SDI ₁₅ +N ₃₀₀	1 st	1 st	19.6±0.8 ^{Aa}	19.5±0.8 ^{Aa}	18.6±0.8 ^{Aa}										
		2 nd	18.8±0.8 ^{Aa}	18.1±0.8 ^{ABa}	17.5±0.8 ^{Bab}										
		3 rd	17.6±0.8 ^{Aa}	16.5±0.7 ^{Ab}	16.4±0.7 ^{Ab}										
		4 th	16.7±0.7 ^{Aa}	14.7±0.6 ^{Bc}	15.0±0.7 ^{ABb}										
	2 nd	1 st	21.1±0.9 ^{ABa}	20.4±0.9 ^{Ba}	23.5±1.0 ^{Aa}										
		2 nd	20.3±0.9 ^{ABa}	18.9±0.8 ^{Bab}	21.3±0.9 ^{Ab}										
		3 rd	18.9±0.8 ^{Ab}	17.5±0.8 ^{Ab}	19.0±0.8 ^{Abc}										
		4 th	17.3±0.7 ^{Ab}	15.9±0.7 ^{Bc}	17.5±0.8 ^{Ac}										
	3 rd	1 st	23.7±1.0 ^{ABa}	22.3±1.0 ^{Ba}	25.1±1.1 ^{Aa}										
		2 nd	22.5±1.0 ^{Aab}	21.8±0.9 ^{Aa}	23.4±1.0 ^{Aab}										
		3 rd	20.9±0.9 ^{Ab}	20.3±0.9 ^{Aa}	21.7±0.9 ^{Ab}										
		4 th	19.4±0.8 ^{Ab}	18.4±0.8 ^{Ab}	20.0±0.9 ^{Ab}										
SDI ₁₅ +N ₂₄₀	1 st	1 st	19.3±0.8 ^{Aa}	19.1±0.8 ^{Aa}	18.3±0.8 ^{Aa}										
		2 nd	18.5±0.8 ^{Aa}	17.9±0.8 ^{Aab}	17.3±0.7 ^{Aa}										
		3 rd	17.4±0.7 ^{Aab}	16.5±0.7 ^{Abc}	16.3±0.7 ^{Ab}										
		4 th	16.6±0.7 ^{Ab}	14.8±0.6 ^{Cc}	15.1±0.6 ^{Bb}										
	2 nd	1 st	20.6±0.9 ^{ABa}	19.9±0.8 ^{Ba}	22.7±1.0 ^{Aa}										
		2 nd	19.8±0.8 ^{ABab}	18.6±0.8 ^{Bab}	20.7±0.9 ^{Ab}										
		3 rd	18.6±0.8 ^{Ab}	17.4±0.7 ^{Ab}	18.7±0.8 ^{Ac}										
		4 th	17.2±0.7 ^{Ab}	15.9±0.7 ^{Bc}	17.3±0.7 ^{Ac}										
	3 rd	1 st	23.0±1.0 ^{Aa}	21.6±0.9 ^{Ba}	24.2±1.0 ^{Aa}										
		2 nd	21.8±0.9 ^{Aab}	21.2±0.9 ^{Aa}	22.7±1.0 ^{Ab}										
		3 rd	20.4±0.9 ^{ABbc}	19.9±0.8 ^{Bb}	21.1±0.9 ^{Ab}										
		4 th	19.1±0.8 ^{ABc}	18.2±0.8 ^{Bc}	19.6±0.8 ^{Ac}										
ANOVA															
I	N	HD	S	I*N	I*HD	I*S	N*HD	N*S		HD*S	I*N*HD	I*N*S	I*HD*S	N*HD*S	I*N*HD*S
*	ns	*	*	ns	ns	ns	ns	ns		*	ns	ns	ns	ns	ns

Means of different uppercase letters (rows) indicate a significant difference at ($p < 0.05$) according to LSD test of soil soil moisture among three horizontal distances (0.07, 0.14, and 0.20 m), while lowercase (columns) indicates a significant difference of soil soil moisture in four sampling times within each irrigation events (1st, 2nd, 3rd, and 4th) within each irrigation event. SDI₁₅+N₃₀₀ and SDI₁₅+N₂₄₀ are not significantly different. I, N, HD, and S represent irrigation, nitrogen, horizontal distance, and sampling time, respectively. ns means not significant and *denotes significant differences at $P < 0.05$. The ANOVA includes Tables S1-S3 as combined.

Table S4 Soil average \pm standard deviation of $\text{NH}_4^+\text{-N}$ mg kg^{-1} under SD1₅ treatments.

Treatment	Irrigation	Sampling	Horizontal distance (m)		
			0.07	0.14	0.20
SDI ₅ + N ₃₀₀	1 st	1 st	23 \pm 1.0 ^{Ba}	19 \pm 0.8 ^{Ba}	39 \pm 1.7 ^{Aa}
		2 nd	18 \pm 0.8 ^{Aab}	14 \pm 0.6 ^{Aa}	24 \pm 1.0 ^{Ab}
		3 rd	13 \pm 0.6 ^{Aab}	9 \pm 0.4 ^{Bb}	18 \pm 0.1 ^{Ac}
		4 th	7 \pm 0.3 ^{Ab}	5 \pm 0.2 ^{Ab}	8 \pm 0.4 ^{Ad}
	2 nd	1 st	15 \pm 0.7 ^{Aa}	12 \pm 0.5 ^{Aa}	18 \pm 0.8 ^{Aa}
		2 nd	9 \pm 0.4 ^{Aa}	11 \pm 0.5 ^{Aab}	10 \pm 0.4 ^{Aab}
		3 rd	5 \pm 0.2 ^{Aa}	7 \pm 0.3 ^{Ab}	7 \pm 0.3 ^{Ab}
		4 th	2 \pm 0.1 ^{Aa}	5 \pm 0.2 ^{Ab}	3 \pm 0.1 ^{Ab}
	3 rd	1 st	11 \pm 0.5 ^{Ba}	6 \pm 0.2 ^{Aa}	13 \pm 0.6 ^{Aa}
		2 nd	6 \pm 0.3 ^{Aa}	4 \pm 0.2 ^{Aa}	6 \pm 0.3 ^{Aab}
		3 rd	4 \pm 0.2 ^{Aa}	3 \pm 0.1 ^{Aa}	3 \pm 0.2 ^{Aab}
		4 th	2 \pm 0.1 ^{Aa}	2 \pm 0.1 ^{Aa}	3 \pm 0.1 ^{Ab}
SDI ₅ + N ₂₄₀	1 st	1 st	19 \pm 0.8 ^{Ba}	16 \pm 0.7 ^{Ba}	31 \pm 1.4 ^{Aa}
		2 nd	15 \pm 0.6 ^{Aa}	12 \pm 0.5 ^{Aab}	19 \pm 0.8 ^{Ab}
		3 rd	11 \pm 0.5 ^{Aa}	8 \pm 0.3 ^{Bbc}	14 \pm 0.6 ^{Abc}
		4 th	6 \pm 0.3 ^{Ab}	4 \pm 0.2 ^{Ac}	6 \pm 0.3 ^{Ac}
	2 nd	1 st	13 \pm 0.5 ^{Aa}	10 \pm 0.4 ^{Aa}	15 \pm 0.6 ^{Aa}
		2 nd	7 \pm 0.3 ^{Ab}	9 \pm 0.4 ^{Aa}	9 \pm 0.4 ^{Aab}
		3 rd	5 \pm 0.2 ^{Ab}	6 \pm 0.3 ^{Aa}	6 \pm 0.3 ^{Abc}
		4 th	2 \pm 0.1 ^{Ab}	4 \pm 0.2 ^{Aa}	3 \pm 0.1 ^{Ac}
	3 rd	1 st	10 \pm 0.4 ^{Aa}	5 \pm 0.2 ^{Ba}	11 \pm 0.5 ^{Aa}
		2 nd	6 \pm 0.2 ^{Aab}	4 \pm 0.2 ^{Aa}	5 \pm 0.2 ^{Aa}
		3 rd	3 \pm 0.1 ^{Aab}	3 \pm 0.1 ^{Aa}	3 \pm 0.1 ^{Aa}
		4 th	2 \pm 0.1 ^{Ab}	2 \pm 0.1 ^{Aa}	2 \pm 0.1 ^{Aa}

Means of different uppercase letters (rows) indicate a significant difference at ($p < 0.05$) according to the LSD test of soil $\text{NH}_4^+\text{-N}$ among three horizontal distances (0.07, 0.14, and 0.20 m), while lowercase (columns) indicates a significant difference in $\text{NH}_4^+\text{-N}$ in four sampling times within each irrigation event (1st, 2nd, 3rd, and 4th) within each irrigation event. SDI₅+N₃₀₀ and SDI₅+N₂₄₀ are not significantly different.

Table S5 Soil average \pm standard deviation of $\text{NH}_4^+\text{-N}$ mg kg^{-1} under SDI_{10} treatments.

Treatment	Irrigation	Sampling	Horizontal distance (m)		
			0.07	0.14	0.20
$\text{SDI}_{10}+\text{N}_{300}$	1 st	1 st	30 \pm 1.3 ^{Ba}	24 \pm 1.0 ^{Ba}	54 \pm 2.3 ^{Aa}
		2 nd	23 \pm 1.0 ^{ABb}	19 \pm 0.8 ^{Bb}	36 \pm 1.5 ^{Ab}
		3 rd	17 \pm 0.7 ^{ABb}	14 \pm 0.6 ^{Bb}	23 \pm 1.0 ^{Ac}
		4 th	12 \pm 0.5 ^{Ab}	11 \pm 0.5 ^{Ab}	11 \pm 0.5 ^{Ac}
	2 nd	1 st	24 \pm 1.0 ^{Aa}	22 \pm 0.9 ^{Aa}	29 \pm 1.2 ^{Aa}
		2 nd	19 \pm 0.8 ^{Ab}	17 \pm 0.7 ^{Aa}	22 \pm 1.0 ^{Ab}
		3 rd	14 \pm 0.6 ^{ABb}	12 \pm 0.5 ^{Bab}	16 \pm 0.7 ^{Ab}
		4 th	10 \pm 0.4 ^{Ab}	8 \pm 0.4 ^{Ab}	11 \pm 0.5 ^{Ac}
	3 rd	1 st	19 \pm 0.8 ^{Aba}	17 \pm 0.7 ^{Ba}	26 \pm 1.1 ^{Aa}
		2 nd	16 \pm 0.7 ^{Aba}	14 \pm 0.6 ^{Bab}	20 \pm 0.9 ^{Aa}
		3 rd	12 \pm 0.5 ^{Aab}	11 \pm 0.5 ^{Ab}	16 \pm 0.7 ^{Aab}
		4 th	9 \pm 0.4 ^{Ab}	8 \pm 0.3 ^{Ab}	12 \pm 0.5 ^{Ab}
$\text{SDI}_{10}+\text{N}_{240}$	1 st	1 st	25 \pm 1.1 ^{Ba}	20 \pm 0.9 ^{Ba}	45 \pm 1.9 ^{Aa}
		2 nd	19 \pm 0.8 ^{Ba}	16 \pm 0.7 ^{Cab}	30 \pm 1.3 ^{Aa}
		3 rd	14 \pm 0.6 ^{Ab}	12 \pm 0.5 ^{Abc}	19 \pm 0.8 ^{Ab}
		4 th	10 \pm 0.4 ^{Ab}	9 \pm 0.4 ^{Ac}	9 \pm 0.4 ^{Ab}
	2 nd	1 st	20 \pm 0.9 ^{Aa}	18 \pm 0.8 ^{Aa}	24 \pm 1.0 ^{Aa}
		2 nd	16 \pm 0.7 ^{Ba}	14 \pm 0.6 ^{Bab}	19 \pm 0.8 ^{Aab}
		3 rd	11 \pm 0.5 ^{Aab}	10 \pm 0.4 ^{Ab}	13 \pm 0.6 ^{Aab}
		4 th	9 \pm 0.4 ^{Ab}	7 \pm 0.3 ^{Ab}	9 \pm 0.4 ^{Ab}
	3 rd	1 st	16 \pm 0.7 ^{Ba}	14 \pm 0.6 ^{Ba}	22 \pm 0.9 ^{Aa}
		2 nd	14 \pm 0.6 ^{Aa}	12 \pm 0.5 ^{Aa}	17 \pm 0.7 ^{Aa}
		3 rd	10 \pm 0.4 ^{Aa}	9 \pm 0.4 ^{Aa}	13 \pm 0.6 ^{Aa}
		4 th	7 \pm 0.3 ^{Aa}	6 \pm 0.3 ^{Aa}	10 \pm 0.4 ^{Aa}

Means of different uppercase letters (rows) indicate a significant difference at ($p < 0.05$) according to the LSD test of soil $\text{NH}_4^+\text{-N}$ among three horizontal distances (0.07, 0.14, and 0.20 m), while lowercase (columns) indicates a significant difference in soil $\text{NH}_4^+\text{-N}$ in four sampling times within each irrigation event (1st, 2nd, 3rd, and 4th) within each irrigation event. $\text{SDI}_{10}+\text{N}_{300}$ and $\text{SDI}_{10}+\text{N}_{240}$ are not significantly different.

Table S6 Soil average \pm standard deviation of $\text{NH}_4^+\text{-N}$ mg kg^{-1} under SDI_{15} treatments.

Treatment	Irrigation	Sampling	Horizontal distance (m)											
			0.07	0.14	0.20									
SDI ₁₅ +N ₃₀₀	1st	1st	40±1.7Ba	34±1.5Ba	62±2.7Aa									
		2nd	31±1.3Ba	26±1.1Ba	44±1.9Ab									
		3rd	20±0.9Ab	18±0.8Ab	28±1.2Ac									
		4th	12±0.5Bc	12±0.5Bb	17±0.7Ac									
	2nd	1st	32±1.4Aa	29±1.2Aa	41±1.8Aa									
		2nd	27±1.2Bb	23±1.0Bb	32±1.4Aa									
		3rd	18±0.8Abc	16±0.7Ac	22±0.9Ab									
		4th	12±0.5Ac	11±0.5Ac	15±0.6Ac									
	3rd	1st	27±1.2Aa	24±1.0Aa	30±1.3Aa									
		2nd	22±1.0Aa	19±0.8Bb	25±1.1Aab									
		3rd	16±0.7Bb	14±0.6Bbc	19±0.8Ab									
		4th	11±0.5Ab	10±0.4Ab	14±0.6Ab									
SDI ₁₅ +N ₂₄₀	1st	1st	34±1.5Ba	29±1.3Ba	52±2.2Aa									
		2nd	27±1.2Bb	23±1.0Bab	37±1.6Ab									
		3rd	18±0.8Bb	16±0.7Bb	25±1.1Ac									
		4th	12±0.5Ab	12±0.5Ab	16±0.7Ac									
	2nd	1st	28±1.2Ba	25±1.1Ba	35±1.5Aa									
		2nd	24±1.0Aab	21±0.9Aa	27±1.2Ab									
		3rd	17±0.7Ab	15±0.7Ab	19±0.8Ab									
		4th	12±0.5Ac	11±0.5Ab	14±0.6Ac									
	3rd	1st	24±1.0Aa	21±0.9Aa	26±1.1Aa									
		2nd	20±0.9Aab	18±0.8Aa	22±0.9Aab									
		3rd	15±0.7Abc	14±0.6Ab	17±0.7Aab									
		4th	11±0.5Ac	10±0.4Ab	13±0.6Ab									
ANOVA														
I	N	HD	S	I*N	I*HD	I*S	N*HD	N*S	HD*S	I*N*HD	I*N*S	I*HD*S	N*HD*S	I*N*HD*S
*	*	*	*	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

Means of different uppercase letters (rows) indicate a significant difference at ($p < 0.05$) according to LSD test of soil $\text{NH}_4^+\text{-N}$ among three horizontal distances (0.07, 0.14, and 0.20 m), while lowercase (columns) indicates a significant difference of soil $\text{NH}_4^+\text{-N}$ in four sampling times within each irrigation events (1st, 2nd, 3rd, and 4th) within each irrigation event. $\text{SDI}_{15}+\text{N}_{300}$ and $\text{SDI}_{15}+\text{N}_{240}$ are not significantly different. I, N, HD, and S represent irrigation, nitrogen, horizontal distance, and sampling time, respectively. Ns means not significant and *denotes significant differences at $P < 0.05$. The ANOVA includes Tables S4-S6 as combined.

Table S7 Soil average \pm standard deviation of NO_3^- -N mg kg^{-1} under SD15 treatments.

Treatment	Irrigation	Sampling	Horizontal distance (m)		
			0.07	0.14	0.20
SDI ₅ +N ₃₀₀	1 st	1 st	57 \pm 2.5 ^{Bad}	64 \pm 2.8 ^{Ad}	48 \pm 2.1 ^{Cd}
		2 nd	109 \pm 4.7 ^{Bc}	125 \pm 5.4 ^{Ac}	93 \pm 4.0 ^{Cc}
		3 rd	206 \pm 8.9 ^{Ab}	212 \pm 9.2 ^{Ab}	128 \pm 5.5 ^{Bb}
		4 th	245 \pm 10.6 ^{Aa}	258 \pm 11.2 ^{Aa}	154 \pm 6.7 ^{Ba}
	2 nd	1 st	77 \pm 3.3 ^{Bd}	92 \pm 4.0 ^{Ad}	71 \pm 3.1 ^{Bd}
		2 nd	178 \pm 7.7 ^{Ac}	184 \pm 8.0 ^{Ac}	116 \pm 5.0 ^{Bc}
		3 rd	208 \pm 9.0 ^{Bb}	244 \pm 10.5 ^{Ab}	158 \pm 6.8 ^{Cb}
		4 th	264 \pm 11.4 ^{Ba}	297 \pm 12.8 ^{Aa}	210 \pm 9.1 ^{Ca}
	3 rd	1 st	83 \pm 3.6 ^{Bd}	155 \pm 6.7 ^{Ad}	93 \pm 4.0 ^{Bd}
		2 nd	193 \pm 8.3 ^{Bc}	301 \pm 13.0 ^{Ac}	188 \pm 8.1 ^{Bc}
		3 rd	372 \pm 16.1 ^{Bb}	429 \pm 18.5 ^{Ab}	274 \pm 11.9 ^{Cb}
		4 th	485 \pm 21.0 ^{Ba}	522 \pm 22.6 ^{Aa}	373 \pm 16.1 ^{Ca}
SDI ₅ +N ₂₄₀	1 st	1 st	40 \pm 1.7 ^{ABb}	50 \pm 2.2 ^{Ad}	34 \pm 1.5 ^{Bc}
		2 nd	95 \pm 4.1 ^{ABab}	107 \pm 4.6 ^{Ac}	94 \pm 4.1 ^{Bb}
		3 rd	183 \pm 7.9 ^{Aa}	202 \pm 8.7 ^{Ab}	123 \pm 5.3 ^{Ba}
		4 th	152 \pm 9.6 ^{Ba}	241 \pm 10.4 ^{Aa}	142 \pm 6.1 ^{Ba}
	2 nd	1 st	62 \pm 2.7 ^{Bd}	80 \pm 3.4 ^{Ad}	57 \pm 2.5 ^{Cd}
		2 nd	148 \pm 6.4 ^{Bc}	163 \pm 7.0 ^{Ac}	107 \pm 4.6 ^{Cc}
		3 rd	176 \pm 7.6 ^{Bb}	222 \pm 9.6 ^{Ab}	156 \pm 6.8 ^{Cb}
		4 th	240 \pm 10.4 ^{Ba}	278 \pm 12.0 ^{Aa}	202 \pm 8.7 ^{Ca}
	3 rd	1 st	81 \pm 3.5 ^{Bd}	131 \pm 5.7 ^{Ad}	71 \pm 3.1 ^{Bd}
		2 nd	181 \pm 7.8 ^{Bc}	231 \pm 10.0 ^{Ac}	156 \pm 6.8 ^{Cc}
		3 rd	297 \pm 12.8 ^{Bb}	353 \pm 15.3 ^{Ab}	224 \pm 9.7 ^{Cb}
		4 th	403 \pm 17.4 ^{Ba}	468 \pm 20.2 ^{Aa}	291 \pm 12.6 ^{Ca}

Means of different uppercase letters (rows) indicate a significant difference at ($p < 0.05$) according to the LSD test of soil NO_3^- -N among three horizontal distances (0.7, 0.14, and 0.20 m), while lowercase (columns) indicates a significant difference in soil NO_3^- -N in four sampling times within each irrigation event (1st, 2nd, 3rd, and 4th) within each irrigation event. SDI₅+N₃₀₀ and SDI₅+N₂₄₀ are not significantly different.

Table S8 Soil average \pm standard deviation of NO_3^- -N mg kg^{-1} under SDI_{10} treatments.

Treatment	Irrigation	Sampling	Horizontal distance (m)		
			0.07	0.14	0.20
$\text{SDI}_{10}+\text{N}_{300}$	1 st	1 st	48 \pm 2.1 ^{Bd}	60 \pm 2.6 ^{Ad}	45 \pm 1.9 ^{Bb}
		2 nd	97 \pm 4.2 ^{Bc}	107 \pm 4.6 ^{Ac}	86 \pm 3.7 ^{Bab}
		3 rd	169 \pm 7.3 ^{Bb}	204 \pm 8.8 ^{Ab}	103 \pm 4.5 ^{Cb}
		4 th	222 \pm 9.6 ^{Aa}	232 \pm 10.0 ^{Aa}	130 \pm 5.6 ^{Ba}
	2 nd	1 st	56 \pm 2.4 ^{Cd}	81 \pm 3.5 ^{Ac}	68 \pm 2.9 ^{Bd}
		2 nd	125 \pm 5.4 ^{Bc}	169 \pm 7.3 ^{Ab}	102 \pm 4.4 ^{Cc}
		3 rd	178 \pm 7.7 ^{Bb}	238 \pm 10.3 ^{Aa}	140 \pm 6.0 ^{Cb}
		4 th	233 \pm 10.1 ^{Ba}	272 \pm 11.8 ^{Aa}	198 \pm 8.5 ^{Ca}
	3 rd	1 st	76 \pm 3.3 ^{Cd}	124 \pm 5.4 ^{Ad}	90 \pm 3.9 ^{Bd}
		2 nd	165 \pm 7.1 ^{Bc}	293 \pm 12.7 ^{Ac}	174 \pm 7.5 ^{Bc}
		3 rd	315 \pm 13.6 ^{Bb}	387 \pm 16.7 ^{Ab}	251 \pm 10.9 ^{Cb}
		4 th	460 \pm 19.9 ^{Ba}	509 \pm 22.0 ^{Aa}	301 \pm 13.0 ^{Ca}
$\text{SDI}_{10}+\text{N}_{240}$	1 st	1 st	38 \pm 1.6 ^{Ad}	45 \pm 1.9 ^{Ad}	28 \pm 1.9 ^{Bd}
		2 nd	87 \pm 3.8 ^{Ac}	99 \pm 4.3 ^{Ac}	67 \pm 2.9 ^{Bc}
		3 rd	151 \pm 6.5 ^{Bb}	174 \pm 7.5 ^{Ab}	91 \pm 3.9 ^{Cb}
		4 th	196 \pm 8.4 ^{Ba}	220 \pm 9.5 ^{Aa}	122 \pm 5.3 ^{Ca}
	2 nd	1 st	50 \pm 2.2 ^{Bc}	71 \pm 3.1 ^{Ad}	52 \pm 2.2 ^{Bd}
		2 nd	118 \pm 5.1 ^{Bb}	141 \pm 6.1 ^{Ac}	85 \pm 3.7 ^{Cc}
		3 rd	159 \pm 6.9 ^{Bb}	183 \pm 7.9 ^{Ab}	130 \pm 5.6 ^{Cb}
		4 th	206 \pm 8.9 ^{Aa}	250 \pm 10.8 ^{Aa}	149 \pm 6.5 ^{Ba}
	3 rd	1 st	62 \pm 2.7 ^{Bd}	103 \pm 4.4 ^{Ad}	64 \pm 2.8 ^{Bb}
		2 nd	153 \pm 6.6 ^{Bc}	197 \pm 8.5 ^{Ac}	132 \pm 5.7 ^{Cb}
		3 rd	274 \pm 11.9 ^{ABb}	313 \pm 13.5 ^{Ab}	151 \pm 9.3 ^{Bb}
		4 th	379 \pm 16.4 ^{Ba}	431 \pm 18.6 ^{Aa}	276 \pm 11.9 ^{Ca}

Means of different uppercase letters (rows) indicate a significant difference at ($p < 0.05$) according to the LSD test of soil NO_3^- -N among three horizontal distances (0.07, 0.14, and 0.20 m), while lowercase (columns) indicates a significant difference in soil NO_3^- -N in four sampling times within each irrigation event (1st, 2nd, 3rd, and 4th) within each irrigation event. $\text{SDI}_{10}+\text{N}_{300}$ and $\text{SDI}_{10}+\text{N}_{240}$ are not significantly different.

Table S9 Soil average \pm standard deviation of NO_3^- -N mg kg^{-1} under SD1₁₅ treatments.

Treatment	Irrigation	Sampling	Horizontal distance (m)		
			0.07	0.14	0.20
SDI ₁₅ +N ₃₀₀	1 st	1 st	40 \pm 1.7 ^{ABd}	53 \pm 2.3 ^{Ad}	39 \pm 1.7 ^{Bd}
		2 nd	91 \pm 3.9 ^{Ac}	98 \pm 4.2 ^{Ac}	76 \pm 3.3 ^{Ac}
		3 rd	145 \pm 6.3 ^{Bb}	180 \pm 7.8 ^{Ab}	99 \pm 4.3 ^{Cb}
		4 th	198 \pm 8.5 ^{Ba}	208 \pm 9.0 ^{Aa}	115 \pm 5.0 ^{Ca}
	2 nd	1 st	45 \pm 1.9 ^{Bb}	69 \pm 3.0 ^{Ad}	56 \pm 2.4 ^{Bd}
		2 nd	80 \pm 4.9 ^{Bb}	134 \pm 5.8 ^{Ac}	96 \pm 4.1 ^{Bc}
		3 rd	172 \pm 7.4 ^{Aa}	201 \pm 8.9 ^{Ab}	128 \pm 5.5 ^{Ab}
		4 th	181 \pm 7.8 ^{Ba}	238 \pm 10.3 ^{Aa}	183 \pm 7.9 ^{Ba}
	3 rd	1 st	64 \pm 2.8 ^{Bd}	108 \pm 4.7 ^{Ad}	78 \pm 3.4 ^{Bd}
		2 nd	157 \pm 6.8 ^{Bc}	259 \pm 11.2 ^{Ac}	147 \pm 6.4 ^{Cc}
		3 rd	235 \pm 10.2 ^{Bb}	333 \pm 14.4 ^{Ab}	215 \pm 9.3 ^{Cb}
		4 th	401 \pm 17.3 ^{Ba}	464 \pm 20.0 ^{Aa}	258 \pm 11.2 ^{Ca}
SDI ₁₅ +N ₂₄₀	1 st	1 st	36 \pm 1.5 ^{Ad}	42 \pm 1.8 ^{Ad}	24 \pm 1.1 ^{Bd}
		2 nd	85 \pm 3.7 ^{Bc}	97 \pm 4.2 ^{Ac}	62 \pm 2.7 ^{Cc}
		3 rd	139 \pm 6.0 ^{Ab}	154 \pm 6.7 ^{Ab}	74 \pm 3.2 ^{Bb}
		4 th	182 \pm 7.8 ^{Ba}	194 \pm 8.4 ^{Aa}	91 \pm 3.9 ^{Ca}
	2 nd	1 st	41 \pm 1.8 ^{Bd}	65 \pm 2.8 ^{Ac}	44 \pm 1.9 ^{Bd}
		2 nd	103 \pm 4.4 ^{Bc}	140 \pm 6.0 ^{Ab}	69 \pm 3.0 ^{Cc}
		3 rd	146 \pm 6.3 ^{Bb}	199 \pm 8.6 ^{Aa}	113 \pm 4.9 ^{Cb}
		4 th	173 \pm 7.5 ^{Ba}	211 \pm 9.1 ^{Aa}	131 \pm 5.7 ^{Ca}
	3 rd	1 st	51 \pm 2.2 ^{Bd}	84 \pm 3.6 ^{Ad}	54 \pm 2.3 ^{Bd}
		2 nd	142 \pm 6.1 ^{Bc}	186 \pm 8.0 ^{Ac}	115 \pm 5.0 ^{Cc}
		3 rd	229 \pm 9.9 ^{Bb}	297 \pm 12.8 ^{Ab}	198 \pm 8.6 ^{Cb}
		4 th	339 \pm 14.7 ^{Ba}	415 \pm 17.9 ^{Aa}	247 \pm 10.7 ^{Ca}

ANOVA

I	N	HD	S	I*N	I*HD	I*S	N*HD	N*S	HD*S	I*N*HD	I*N*S	I*HD*S	N*HD*S	I*N*HD*S
*	ns	*	*	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

Notes: means of different uppercase letters (rows) indicate a significant difference at ($p < 0.05$) according to LSD test of soil NO_3^- -N among three horizontal distances (0.07, 0.14, and 0.20 m), while lowercase (columns) indicates a significant difference in soil NO_3^- -N in four sampling times within each irrigation event (1st, 2nd, 3rd, and 4th) within each irrigation event. SDI₁₅+N₃₀₀ and SDI₁₅+N₂₄₀ are not significantly different. I, N, HD, and S represent irrigation, nitrogen, horizontal distance, and Sampling time, respectively. Ns means not significant and *denotes significant differences at $P \leq 0.05$. The ANOVA includes Tables S7-S9 combined.

Table S10 Correlations (R^2) between N_2O emissions and soil moisture at different depths under SDI_{10} .

Treatment	Horizontal distance m)	Depths (cm)	Point1	Point2	Point3	Point4	Point5
$SDI_{10}+N_{300}$	0.07 m	5	0.0062	0.0042	0.0132	0.0116	0.0130
		10	0.1300	0.1112	0.1522	0.1430	0.1488
		15	0.1775	0.1313	0.1996	0.1748	0.1778
		20	0.0106	0.0027	0.0220	0.0215	0.0195
		25	0.0003	0.0029	0.0002	0.0007	0.0002
	0.14 m	5	0.1891	0.1576	0.2061	0.1974	0.1914
		10	0.1294	0.0941	0.1463	0.1296	0.1358
		15	0.0937	0.0604	0.1044	0.0845	0.0913
		20	0.0176	0.0046	0.0164	0.0092	0.0092
		25	0.0006	0.0032	0.0000	0.0001	0.0001
	0.20 m	5	0.0530	0.0398	0.0719	0.0730	0.0719
		10	0.0962	0.0725	0.1142	0.1103	0.1013
		15	0.0144	0.0079	0.0237	0.0256	0.0217
		20	0.0055	0.0015	0.0102	0.0121	0.0097
		25	0.0140	0.0117	0.0198	0.0285	0.0216
$SDI_{10}+N_{240}$	0.07 m	5	0.0036	0.0001	0.0079	0.0121	0.0174
		10	0.0966	0.0767	0.1187	0.1444	0.1704
		15	0.1186	0.1181	0.1318	0.1673	0.1978
		20	0.0025	0.0016	0.0052	0.0141	0.0186
		25	0.0079	0.0112	0.0023	0.0002	0.0003
	0.14 m	5	0.1502	0.1304	0.1697	0.1879	0.2128
		10	0.0903	0.0698	0.1073	0.1275	0.1515
		15	0.0542	0.0455	0.0670	0.0831	0.1101
		20	0.0008	0.0003	0.0041	0.0060	0.0174
		25	0.0079	0.0134	0.0020	0.0007	0.0002
	0.20 m	5	0.0380	0.0193	0.0555	0.0665	0.0752
		10	0.0642	0.0430	0.0851	0.0993	0.1128
		15	0.0044	0.0001	0.0135	0.0188	0.0251
		20	0.0000	0.0010	0.0022	0.0053	0.0112
		25	0.0046	0.0000	0.0172	0.0176	0.0232

Note: values in bold are the maximum correlation among five depths in each point.

Table S11 Correlations (R^2) between N_2O emissions and soil moisture at different depths under SDI₁₅.

Treatment	Horizontal distance (m)	Depths (cm)	Point1	Point2	Point3	Point4	Point5
SDI ₁₅ +N ₃₀₀	0.07 m	5	0.0260	0.0217	0.0217	0.0257	0.0139
		10	0.0074	0.0119	0.0204	0.0093	0.0142
		15	0.1191	0.1352	0.1498	0.0990	0.1297
		20	0.1279	0.1561	0.1691	0.1501	0.1481
		25	0.0022	0.0081	0.0127	0.0117	0.0087
	0.14 m	5	0.0059	0.0031	0.0006	0.0023	0.0006
		10	0.1422	0.1528	0.1731	0.1373	0.1624
		15	0.0991	0.1159	0.1234	0.0881	0.1071
		20	0.0613	0.0751	0.0866	0.0728	0.0786
		25	0.0019	0.0051	0.0067	0.0052	0.0070
	0.20 m	5	0.0109	0.0160	0.0175	0.0040	0.0187
		10	0.0475	0.0601	0.0661	0.0422	0.0612
		15	0.0761	0.0951	0.0968	0.0666	0.0913
		20	0.0084	0.0151	0.0173	0.0062	0.0163
		25	0.0006	0.0035	0.0057	0.0012	0.0041
SDI ₁₅ +N ₂₄₀	0.07 m	5	0.0082	0.0138	0.0044	0.1730	0.0153
		10	0.0262	0.0139	0.0676	0.0190	0.0377
		15	0.1607	0.1336	0.2358	0.1556	0.1939
		20	0.2174	0.1789	0.3244	0.1844	0.2257
		25	0.0302	0.0148	0.0707	0.0137	0.0299
	0.14 m	5	0.0003	0.0005	0.0073	0.0005	0.0002
		10	0.2028	0.1726	0.2930	0.1812	0.2137
		15	0.1496	0.1186	0.2314	0.1341	0.1688
		20	0.1182	0.0909	0.1955	0.0962	0.1223
		25	0.0236	0.0132	0.0556	0.0116	0.0178
	0.20 m	5	0.0265	0.0165	0.0355	0.0184	0.0286
		10	0.0819	0.0611	0.1224	0.0692	0.0922
		15	0.1294	0.1038	0.1936	0.1107	0.1352
		20	0.0305	0.0182	0.0578	0.0212	0.0337
		25	0.0162	0.0063	0.0361	0.0062	0.0167

Note: values in bold are the maximum correlation among five depths in each point.

Table S12 Correlations (R^2) between N_2O emissions and soil NH_4^+-N at different depths under SDI_5 .

Treatment	Horizontal distance (m)	Depths (cm)	Point1	Point2	Point3	Point4	Point5
SDI_5+N_{300}	0.07 m	5	0.4249*	0.4112*	0.3753*	0.4122*	0.4120*
		10	0.3113	0.3249	0.2863	0.2833	0.3137
		15	0.3254	0.3520*	0.2931	0.3148	0.3220
		20	0.3709*	0.4054*	0.3392*	0.3673*	0.3605*
		25	0.3588*	0.3840*	0.3333*	0.3610*	0.3557*
	0.14 m	5	0.3534*	0.3727*	0.3564*	0.3292	0.3357*
		10	0.2914	0.3162	0.2944	0.2737	0.2796
		15	0.1534	0.1675	0.1594	0.1288	0.1334
		20	0.1365	0.1412	0.1568	0.1125	0.1221
		25	0.3531*	0.4188*	0.4023*	0.3567*	0.3714*
	0.20 m	5	0.2783	0.3055	0.2507	0.2630	0.2682
		10	0.2626	0.2951	0.2402	0.2532	0.2550
		15	0.1776	0.1956	0.1551	0.1649	0.1623
		20	0.2040	0.2221	0.1829	0.1915	0.1854
		25	0.2562	0.2942	0.2387	0.2575	0.2469
SDI_5+N_{240}	0.07 m	5	0.4219*	0.3748*	0.4660*	0.3967*	0.4277*
		10	0.3223	0.3120	0.3485*	0.3104	0.3367*
		15	0.3110	0.2907	0.3628*	0.3290	0.3333*
		20	0.3369*	0.3162	0.4066*	0.3643*	0.3611*
		25	0.3415*	0.3041	0.3922*	0.3784*	0.3599*
	0.14 m	5	0.3389*	0.3364*	0.3912*	0.3375*	0.3616*
		10	0.2781	0.2729	0.3302	0.2882	0.3037
		15	0.1262	0.1329	0.1726	0.1149	0.1423
		20	0.1242	0.1292	0.1586	0.1057	0.1401
		25	0.3282	0.3681*	0.4065*	0.3513*	0.3887*
	0.20 m	5	0.2656	0.2557	0.3181	0.2691	0.2819
		10	0.2511	0.2386	0.3068	0.2715	0.2750
		15	0.1616	0.1447	0.2073	0.1705	0.1745
		20	0.1826	0.1629	0.2344	0.1907	0.1946
		25	0.2263	0.2118	0.2928	0.2618	0.2538

Note: * denotes the significant correlation between N_2O emissions and soil NH_4^+-N at different depths. Point1, point2, point3, point4, and point5 represent chamber NO 1, 2, 3, 4, and 5, respectively.

Table S13 Correlations (R^2) between N_2O emissions and soil NH_4^+-N at different depths under SDI_{10} .

Treatment	Horizontal distance (m)	Depths (cm)	Point1	Point2	Point3	Point4	Point5
$SDI_{10}+N_{300}$	0.07 m	5	0.3292	0.2813	0.3168	0.2529	0.2859
		10	0.3757*	0.3456*	0.3602*	0.2994	0.3323*
		15	0.3826*	0.3479*	0.3637*	0.2978	0.3371*
		20	0.4145*	0.3802*	0.3877*	0.3191	0.3573*
		25	0.3439*	0.2994	0.3241	0.2552	0.2922
	0.14 m	5	0.3433*	0.2819	0.3204	0.2506	0.2892
		10	0.3102	0.2941	0.2898	0.2345	0.2702
		15	0.4614*	0.4378*	0.4317*	0.3660*	0.4047*
		20	0.3888*	0.3451*	0.3917*	0.3589*	0.3572*
		25	0.4229*	0.3897*	0.4503*	0.4199*	0.4147*
	0.20 m	5	0.6040*	0.5817*	0.5987*	0.5260*	0.5773*
		10	0.1011	0.0803	0.0788	0.0426	0.0652
		15	0.1090	0.0794	0.0905	0.0518	0.0780
		20	0.4525*	0.4119*	0.4433*	0.3764*	0.4156*
		25	0.4152*	0.3753*	0.3933*	0.3196	0.3633*
$SDI_{10}+N_{240}$	0.07 m	5	0.3067	0.2815	0.2960	0.3010	0.3248
		10	0.3778*	0.3379*	0.3702*	0.3613*	0.3829*
		15	0.3827*	0.3431*	0.3751*	0.3624*	0.3878*
		20	0.3975*	0.3797*	0.3869*	0.3809*	0.4139*
		25	0.3391*	0.3213	0.3144	0.3141	0.3362*
	0.14 m	5	0.3076	0.2889	0.2942	0.2984	0.3292
		10	0.3192	0.2933	0.3079	0.2954	0.3209
		15	0.4588*	0.4299*	0.4520*	0.4333*	0.4640*
		20	0.3922*	0.3101	0.3979*	0.3872*	0.3734*
		25	0.4571*	0.3636*	0.4608*	0.4587*	0.4255*
	0.20 m	5	0.6070*	0.6258*	0.5827*	0.5966*	0.6280*
		10	0.0829	0.0911	0.0714	0.0700	0.0959
		15	0.0758	0.0749	0.0748	0.0769	0.1130
		20	0.4400*	0.4281*	0.4230*	0.4327*	0.4681*
		25	0.4024*	0.3966*	0.3826*	0.3807*	0.4186*

Note: * denotes the significant correlation between N_2O emissions and soil NH_4^+-N at different depths. Point1, point2, point3, point4, and point5 represent chamber NO 1, 2, 3, 4, and 5, respectively.

Table S14 Correlations (R^2) between N_2O emissions and soil NH_4^+-N at different depths under SDI_{15} .

Treatment	Horizontal distance (m)	Depths (cm)	Point1	Point2	Point3	Point4	Point5
$SDI_{15}+N_{300}$	0.07 m	5	0.5138*	0.5035*	0.4992*	0.4475*	0.4886*
		10	0.2342	0.2294	0.2263	0.1879	0.2138
		15	0.3585*	0.3283	0.3454*	0.3121	0.3584*
		20	0.4898*	0.4499*	0.4688*	0.4412*	0.4944*
		25	0.3158	0.3185	0.2781	0.2352	0.2414
	0.14 m	5	0.6388*	0.6274*	0.6290*	0.5840*	0.6258*
		10	0.2276	0.2206	0.2273	0.1868	0.2224
		15	0.3362*	0.3091	0.3168	0.2815	0.3279
		20	0.4280*	0.3972*	0.3887*	0.3498*	0.3958*
		25	0.2051	0.1880	0.1872	0.1680	0.1830
	0.20 m	5	0.2977	0.2683	0.2674	0.2522	0.2639
		10	0.2714	0.2627	0.2595	0.2284	0.2471
		15	0.3342*	0.3029	0.3117	0.2861	0.3137
		20	0.3724*	0.3418*	0.3453*	0.3054	0.3516*
		25	0.4022*	0.3924*	0.3934*	0.3417*	0.3767*
$SDI_{15}+N_{240}$	0.07 m	5	0.5138*	0.5035*	0.4992*	0.4475*	0.4886*
		10	0.2342	0.2294	0.2263	0.1879	0.2138
		15	0.3585*	0.3283	0.3454*	0.3121	0.3584*
		20	0.4898*	0.4499*	0.4688*	0.4412*	0.4944*
		25	0.3158	0.3185	0.2781	0.2352	0.2414
	0.14 m	5	0.6388*	0.6274*	0.6290*	0.5840*	0.6258*
		10	0.2276	0.2206	0.2273	0.1868	0.2224
		15	0.3362*	0.3091	0.3168	0.2815	0.3279
		20	0.4280*	0.3972*	0.3887*	0.3498*	0.3958*
		25	0.2051	0.1880	0.1872	0.1680	0.1830
	0.20 m	5	0.2977	0.2683	0.2674	0.2522	0.2639
		10	0.2714	0.2627	0.2595	0.2284	0.2471
		15	0.3342*	0.3029	0.3117	0.2861	0.3137
		20	0.3724*	0.3418*	0.3453*	0.3054	0.3516*
		25	0.5138*	0.5035*	0.4992*	0.4475*	0.4886*

Note: * denotes the significant correlation between N_2O emissions and soil NH_4^+-N at different depths. Point1, point2, point3, point4, and point5 represent chamber NO 1, 2, 3, 4, and 5, respectively.

Table S15 Correlations (R^2) between N_2O emissions and soil NO_3^- at different depths under SDI₅.

Treatment	Horizontal distance(m)	Depths (cm)	Point1	Point2	Point3	Point4	Point5
SDI ₅ +N ₃₀₀	0.07 m	5	0.3088	0.2908	0.2735	0.2692	0.2995
		10	0.3475*	0.3202	0.3045	0.2979	0.3382*
		15	0.4733*	0.4418*	0.4213*	0.4382*	0.4662*
		20	0.4146*	0.3806*	0.3272	0.3464*	0.3835*
		25	0.3941*	0.3638*	0.2946	0.3339*	0.3867*
	0.14 m	5	0.3752*	0.3530*	0.3353*	0.3302	0.3686*
		10	0.2871	0.2750	0.2829	0.2716	0.2860
		15	0.3957*	0.3671*	0.3501*	0.3163	0.3349*
		20	0.4015*	0.3801*	0.3828*	0.3392*	0.3515*
		25	0.3969*	0.3688*	0.3445*	0.2874	0.3305
	0.20 m	5	0.3276	0.3112	0.2881	0.2961	0.3303
		10	0.2765	0.2551	0.2474	0.2277	0.2676
		15	0.2426	0.2188	0.2259	0.1781	0.2059
		20	0.3188	0.3055	0.3226	0.3240	0.3210
		25	0.4151*	0.3945*	0.4061*	0.3956*	0.3967*
SDI ₅ +N ₂₄₀	0.07 m	5	0.3164	0.2966	0.3039	0.2815	0.3241
		10	0.4391*	0.4309*	0.4666*	0.3932*	0.4559*
		15	0.3618*	0.3369*	0.3789*	0.3266	0.3766*
		20	0.4009*	0.3819*	0.4194*	0.3731*	0.4313*
		25	0.4748*	0.4675*	0.5292*	0.4420*	0.5144*
	0.14 m	5	0.3079	0.2919	0.3248	0.2911	0.3339*
		10	0.4069*	0.3930*	0.3978*	0.3765*	0.4069*
		15	0.3447*	0.3193	0.3638*	0.2752	0.3379*
		20	0.3569*	0.3626*	0.3763*	0.3182	0.3546*
		25	0.3748*	0.3663*	0.3933*	0.3555*	0.4169*
	0.20 m	5	0.3070	0.2940	0.3301	0.2578	0.3076
		10	0.2690	0.2343	0.2817	0.2213	0.2621
		15	0.3811*	0.3556*	0.3854*	0.3517*	0.3928*
		20	0.2852	0.2582	0.2663	0.2745	0.2908
		25	0.2989	0.2687	0.2828	0.2791	0.3096

Note: * denotes the significant correlation between N_2O emissions and soil NO_3^- at different depths. Point1, point2, point3, point4, and point5 represent chamber NO 1, 2, 3, 4, and 5, respectively.

Table S16 Correlations (R^2) between N_2O emissions and soil NO_3^- at different depths under SDI_{10} .

Treatment	Horizontal distance (m)	Depths (cm)	Point1	Point2	Point3	Point4	Point5
$SDI_{10}+N_{300}$	0.07 m	5	0.3104	0.2775	0.3313	0.2950	0.3287
		10	0.4249*	0.3912*	0.4448*	0.3925*	0.4391*
		15	0.4069*	0.3758*	0.4062*	0.3665*	0.3794*
		20	0.2321	0.1972	0.2426	0.2095	0.2347
		25	0.1787	0.1607	0.1983	0.1687	0.1889
	0.14 m	5	0.3291	0.3195	0.3476*	0.3180	0.3473*
		10	0.4165*	0.4041*	0.4238*	0.3834*	0.4230*
		15	0.2706	0.2569	0.2899	0.2605	0.2896
		20	0.4367*	0.4179*	0.4232*	0.3909*	0.4158*
		25	0.3303	0.3283	0.3067	0.2876	0.2735
	0.20 m	5	0.2988	0.2833	0.3178	0.2849	0.3140
		10	0.2718	0.2531	0.2960	0.2636	0.3032
		15	0.2524	0.2481	0.2565	0.2319	0.2393
		20	0.2798	0.2484	0.2822	0.2355	0.2703
		25	0.2188	0.1953	0.2167	0.1828	0.1945
$SDI_{10}+N_{240}$	0.07 m	5	0.4368*	0.4096*	0.4191*	0.4465*	0.4466*
		10	0.3514*	0.3342*	0.3254	0.3454*	0.3446*
		15	0.2356	0.2047	0.2144	0.2237	0.2184
		20	0.3985*	0.3521*	0.3797*	0.3887*	0.3949*
		25	0.3286	0.2976	0.3057	0.3376*	0.3196
	0.14 m	5	0.3887*	0.3642*	0.3618*	0.3745*	0.3819*
		10	0.4342*	0.4066*	0.4084*	0.4219*	0.4210*
		15	0.3615*	0.3210	0.3383*	0.3517*	0.3448*
		20	0.3943*	0.3658*	0.3647*	0.3791*	0.3686*
		25	0.3272	0.2849	0.3001	0.3180	0.2999
	0.20 m	5	0.2564	0.2345	0.2223	0.2401	0.2289
		10	0.4109*	0.3914*	0.3635*	0.3851*	0.3633*
		15	0.2903	0.2560	0.2558	0.2663	0.2393
		20	0.4546*	0.4281*	0.4364*	0.4577*	0.4632*
		25	0.3999*	0.3918*	0.3602*	0.3923*	0.3725*

Note: * denotes the significant correlation between N_2O emissions and soil NO_3^- at different depths. Point1, point2, point3, point4, and point5 represent chamber NO 1, 2, 3, 4, and 5, respectively.

Table S17 Correlations (R^2) between N_2O emissions and soil NO_3^- at different depths under SDI_{15} .

Treatment	Horizontal distance (m)	Depths (cm)	Point1	Point2	Point3	Point4	Point5
$SDI_{15}+N_{300}$	0.07 m	5	0.3401*	0.3355*	0.3266	0.2952	0.2974
		10	0.2629	0.2570	0.2601	0.2327	0.2558
		15	0.3789*	0.3839*	0.3505*	0.3047	0.3309
		20	0.2651	0.2616	0.2664	0.2278	0.2566
		25	0.4273*	0.4527*	0.4424*	0.4158*	0.4037*
	0.14 m	5	0.4068*	0.3964*	0.3977*	0.3530*	0.3777*
		10	0.3608*	0.3510*	0.3412*	0.3043	0.3309
		15	0.4415*	0.4151*	0.4260*	0.3636*	0.4121*
		20	0.3828*	0.3731*	0.3563*	0.3381*	0.3437*
		25	0.3023	0.3051	0.3008	0.2579	0.2641
	0.20 m	5	0.2781	0.2705	0.2681	0.2486	0.2544
		10	0.3854*	0.4045*	0.3709*	0.3560*	0.3450*
		15	0.3414*	0.3458*	0.3037	0.3026	0.2884
		20	0.3157	0.3102	0.2942	0.2877	0.2732
		25	0.0645	0.0457	0.0673	0.0248	0.0530
$SDI_{15}+N_{240}$	0.07 m	5	0.3575*	0.3441*	0.3521*	0.3038	0.3318*
		10	0.2306	0.2313	0.2308	0.1846	0.2104
		15	0.3397*	0.3545*	0.3265	0.3303	0.2895
		20	0.3581*	0.3575*	0.3791*	0.3346*	0.3835*
		25	0.3893*	0.3957*	0.3849*	0.3463*	0.3760*
	0.14 m	5	0.3439*	0.3485*	0.3308	0.3270	0.3077
		10	0.2646	0.2679	0.2487	0.2239	0.2254
		15	0.4340*	0.4384*	0.4333*	0.3834*	0.4079*
		20	0.4310*	0.4321*	0.4394*	0.3947*	0.4127*
		25	0.2974	0.2859	0.2975	0.2751	0.2933
	0.20 m	5	0.3461*	0.3504*	0.3340*	0.3307	0.3137
		10	0.2838	0.2873	0.2734	0.2580	0.2452
		15	0.2815	0.2774	0.2756	0.2002	0.2567
		20	0.2108	0.2059	0.1955	0.1687	0.1868
		25	0.1730	0.1711	0.1502	0.1670	0.1384

Note: * denotes the significant correlation between N_2O emissions and soil NO_3^- at different depths. Point1, point2, point3, point4, and point5 represent chamber NO 1, 2, 3, 4, and 5, respectively.