

Supplementary material

Table S1: The mean mineralizable nitrogen ($N_{\min}$), NH_4^+ -N, NO_3^- -N and WFPS for the different N fertilization treatments (N0, N20, N40, N60 and N80) for soil depth 0-10 cm, during the trial period (June 2018 – June 2019). The standard error of the mean is shown in brackets. The N0, N20, N40, N60 and N80 refer to the different treatments used and were 0, 220, 440, 660 and 880 kg N ha⁻¹ year⁻¹ respectively.

		2018-05-29	2018-07-10	2018-08-14	2018-09-11	2018-10-09	2018-11-07	2018-12-04	2018-12-31	2019-01-29	2019-02-26	2019-03-26	2019-05-28
$N_{\min}$ kg ha ⁻¹	N0	30.4 (1.8)	34.2 (2.7)	25.7 (1.1)	19.8 (1.1)	38.5 (2.5)	27.7 (1.0)	27.3 (2.0)	18.5 (1.8) ^a	27.5 (8.2) ^{ab}	21.7 (0.4) ^a	33.5 (2.5) ^a	18.7 (2.1)
	N20	29.0 (2.3)	32.1 (2.9)	28.0 (1.4)	22.1 (1.4)	40.2 (3.2)	28.4 (2.9)	27.5 (2.4)	20.3 (1.8) ^a	30.2 (16.8) ^{ab}	21.7 (1.3) ^{ab}	33.7 (2.9) ^a	16.6 (1.6)
	N40	26.7 (1.2)	31.3 (4.7)	30.1 (2.1)	22.3 (2.1)	56.5 (10.0)	33.6 (1.9)	25.1 (2.8)	20.5 (2.1) ^a	14.6 (2.2) ^a	23.2 (2.0) ^{ab}	45.4 (8.9) ^a	17.0 (2.7)
	N60	26.9 (1.9)	45.6 (7.4)	37.9 (4.9)	22.6 (1.9)	50.5 (5.2)	47.2 (7.5)	37.9 (6.3)	31.8 (3.4) ^{ab}	65.5 (11.2) ^c	48.7 (4.2) ^b	97.8 (11.5) ^b	17.0 (1.2)
	N80	32.8 (4.3)	41.1 (4.2)	48.3 (18.6)	30.7 (3.6)	60.3 (3.8)	53.2 (17.6)	72.2 (11.2)	78.9 (20.0) ^b	73.7 (24.6) ^{bc}	76.0 (3.2) ^b	131.7 (30.9) ^b	21.3 (2.3)
NO_3^- -N kg ha ⁻¹	N0	4.8 (1.3)	7.1 (2.0)	4.2 (0.7)	3.8 (0.9)	3.0 (0.2) ^a	4.1 (0.3)	5.7 (0.5)	3.6 (0.8) ^a	17.9 (8.2) ^{ab}	6.0 (1.0) ^a	11.8 (3.3) ^a	6.7 (0.8)
	N20	5.5 (0.5)	5.7 (0.7)	5.3 (0.9)	4.7 (0.8)	5.8 (0.7) ^{ab}	4.3 (0.9)	7.1 (0.9)	4.3 (0.7) ^a	21.4 (16.7) ^{ab}	7.4 (1.5) ^{ab}	9.9 (1.9) ^a	6.6 (0.6)
	N40	5.4 (0.3)	4.4 (1.1)	7.0 (1.1)	5.3 (0.9)	22.3 (6.8) ^b	7.7 (1.6)	5.7 (0.4)	4.8 (0.9) ^a	6.6 (2.1) ^a	7.3 (1.3) ^a	23.9 (8.2) ^a	7.0 (1.2)
	N60	4.4 (1.1)	19.1 (7.8)	13.8 (4.3)	6.5 (1.5)	16.2 (4.6) ^{ab}	19.0 (6.4)	11.3 (5.6)	16.4 (2.4) ^{ab}	54.1 (9.4) ^c	31.1 (4.8) ^{bc}	70.3 (11.3) ^b	7.3 (0.5)
	N80	6.5 (1.1)	11.6 (4.4)	23.0 (15.9)	14.5 (3.5)	18.7 (6.2) ^{ab}	21.9 (11.4)	43.5 (8.7)	56.0 (14.1) ^b	61.9 (22.7) ^{bc}	59.0 (4.2) ^c	104.5 (29.0) ^b	11.3 (2.5)
NH_4^+ -N kg ha ⁻¹	N0	25.6 (0.9)	27.0 (0.8)	21.5 (1.7)	16.0 (0.2)	35.6 (2.6)	23.6 (0.9)	21.5 (1.6)	15.0 (1.2)	9.6 (0.2)	15.7 (0.9)	21.8 (0.8)	12.0 (1.7)
	N20	23.5 (1.9)	26.4 (2.3)	22.7 (1.1)	17.4 (1.3)	34.4 (3.6)	24.2 (3.5)	20.3 (1.8)	16.0 (1.5)	8.8 (0.9)	14.3 (1.4)	23.8 (2.1)	10.0 (1.1)
	N40	21.3 (1.2)	26.9 (3.8)	23.1 (1.8)	17.0 (1.3)	34.2 (3.8)	26.0 (2.0)	19.3 (2.6)	15.7 (1.7)	8.0 (0.6)	15.8 (1.1)	21.5 (0.8)	10.0 (1.6)
	N60	22.5 (1.2)	26.5 (1.0)	24.1 (2.1)	16.1 (0.9)	34.4 (2.1)	28.2 (3.8)	26.5 (0.9)	15.4 (1.1)	11.4 (1.9)	17.6 (0.9)	27.4 (0.8)	9.7 (1.4)
	N80	26.3 (3.4)	29.6 (1.7)	25.3 (3.1)	16.2 (1.0)	41.6 (3.2)	31.3 (6.6)	28.7 (4.6)	23.0 (6.5)	11.8 (2.0)	17.0 (1.3)	27.1 (1.9)	10.0 (1.2)
WFPS (%)	N0	59.9 (1.6)	52.4 (1.8)	57.9 (2.2)	60.3 (1.7)	53.0 (1.4)	59.1 (1.9)	51.9 (2.2)	45.4 (3.3)	39.9 (2.9)	41.0 (1.7)	56.7 (1.7)	64.3 (2.1)
	N20	56.3 (1.3)	46.3 (3.3)	53.5 (1.0)	57.3 (2.6)	53.3 (1.1)	55.1 (1.7)	51.1 (1.3)	41.1 (1.2)	37.8 (1.2)	41.8 (2.7)	57.6 (1.3)	63.2 (1.2)
	N40	56.6 (1.9)	46.6 (0.8)	54.4 (2.3)	61.9 (3.1)	51.8 (1.8)	55.9 (0.5)	49.7 (2.1)	43.4 (1.5)	38.1 (1.5)	47.1 (2.2)	56.4 (2.0)	58.8 (1.1)
	N60	58.8 (1.0)	48.2 (1.0)	54.5 (3.0)	54.8 (0.6)	45.9 (1.4)	54.9 (1.7)	53.1 (2.6)	41.5 (3.4)	37.4 (3.5)	40.3 (2.7)	53.0 (1.0)	57.7 (1.6)
	N80	56.5 (2.6)	43.8 (4.0)	50.3 (2.9)	55.6 (1.2)	47.9 (1.7)	51.4 (2.0)	52.9 (2.4)	41.3 (0.9)	37.9 (2.1)	39.5 (2.6)	52.8 (2.5)	60.0 (0.6)

No common letter indicates significant differences between treatments ($p < 0.05$)