

Supplement

Interactions of nitrogen and phosphorus in plant nutrition - Analysis of a 60-years old field experiment

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Table S1 Rates of nitrogen (N), phosphorus (P), and potassium (K) application in the different treatments for the different crops in south and central Sweden.

	Crop	N, P, and K application (kg ha ⁻¹ yr ⁻¹)				
		Low N	Medium N	High N	Low P	High P
South Sweden	Spring barley	30	60	90	15 P + 40 K	30 P + 80 K
	Oil seed	50	100	150	15 P + 40 K	30 P + 80 K
	Winter wheat	50	100	150	15 P + 40 K	30 P + 80 K
	Sugar beets	70	140	210	15 P + 40 K	30 P + 80 K
Central Sweden	Spring barley	25	50	75	20 P + 50 K	30 P + 80 K
	Oat	40	80	120	20 P + 50 K	30 P + 80 K
	Oil seed	50	100	150	20 P + 50 K	30 P + 80 K
	Winter wheat	40	80	120	20 P + 50 K	30 P + 80 K
	Oat	40	80	120	20 P + 50 K	30 P + 80 K
	Winter wheat	50	100	150	20 P + 50 K	30 P + 80 K

Table S2 Mean ($\pm$ standard deviation) N:P ratio of the yields (grains or beets) of winter wheat, spring barley, oat, and sugar beet in the control, the N, P, and NP treatment of the three fertilization regimes (low, medium, and high). The N:P ratio is calculated as a mass:mass ratio.

	Control	N	P	NP
Winter wheat				
Low	3.6 ($\pm$ 1.5)	4.3 ($\pm$ 1.9)	5.4 ($\pm$ 2.4)	6.4 ($\pm$ 2.8)
Medium	3.6 ($\pm$ 1.5)	3.7 ($\pm$ 1.6)	3.9 ($\pm$ 1.7)	3.6 ($\pm$ 1.5)
High	3.6 ($\pm$ 1.5)	4.1 ($\pm$ 1.7)	3.5 ($\pm$ 1.5)	4.7 ($\pm$ 2.0)
Spring barley				
Low	3.9 ($\pm$ 1.4)	4.3 ($\pm$ 1.6)	5.2 ($\pm$ 2.1)	6.1 ($\pm$ 2.4)
Medium	3.9 ($\pm$ 1.4)	3.8 ($\pm$ 1.3)	3.9 ($\pm$ 1.5)	3.7 ($\pm$ 1.3)
High	3.9 ($\pm$ 1.4)	4.2 ($\pm$ 1.8)	3.6 ($\pm$ 1.2)	4.4 ($\pm$ 1.8)
Oat				
Low	3.7 ($\pm$ 1.7)	4.1 ($\pm$ 1.9)	4.7 ($\pm$ 2.1)	5.2 ($\pm$ 2.3)
Medium	3.7 ($\pm$ 1.7)	3.6 ($\pm$ 1.6)	3.7 ($\pm$ 1.7)	3.6 ($\pm$ 1.6)
High	3.7 ($\pm$ 1.7)	3.7 ($\pm$ 1.6)	3.6 ($\pm$ 1.8)	3.8 ($\pm$ 1.7)
Sugar beet				
Low	1.4 ($\pm$ 1.9)	1.8 ($\pm$ 2.5)	2.1 ($\pm$ 2.9)	2.7 ($\pm$ 3.6)
Medium	1.4 ($\pm$ 1.9)	1.3 ($\pm$ 2.3)	1.4 ($\pm$ 2.3)	1.1 ($\pm$ 1.8)
High	1.4 ($\pm$ 1.9)	1.4 ($\pm$ 2.4)	1.0 ($\pm$ 1.6)	1.2 ($\pm$ 1.6)

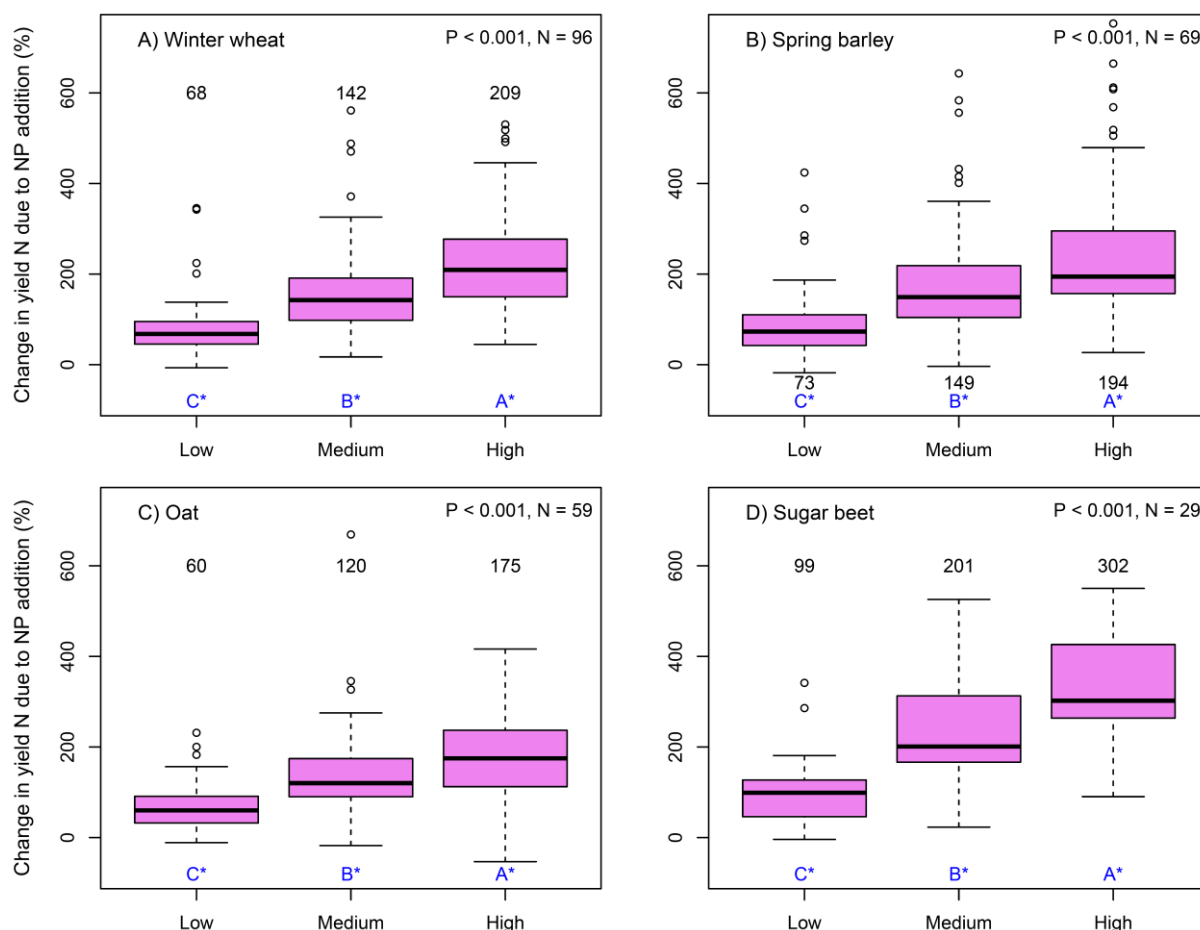


Fig. S1 Change in yield nitrogen (yield N) of the four plant species winter wheat (A), spring barley (B), oat (C), and sugar beet (D) due to combined nitrogen and phosphorus (NP) addition in the three fertilization regimes (low, medium, and high). The change is given in percentage in relation to the yield N in the control treatment. Yield N (in g m^{-2}) was calculated by multiplying the yield with its N content. The number of observations (N) and the P value of the Kruskal-Wallis test is given in the right corner of each panel. Black numbers depict the median. Different blue capital letters indicate significant ($P < 0.05$) differences according to the Dunn post hoc test, tested separately for each crop. Blue asterisks indicate significant ($P < 0.05$) differences compared to the control treatment.

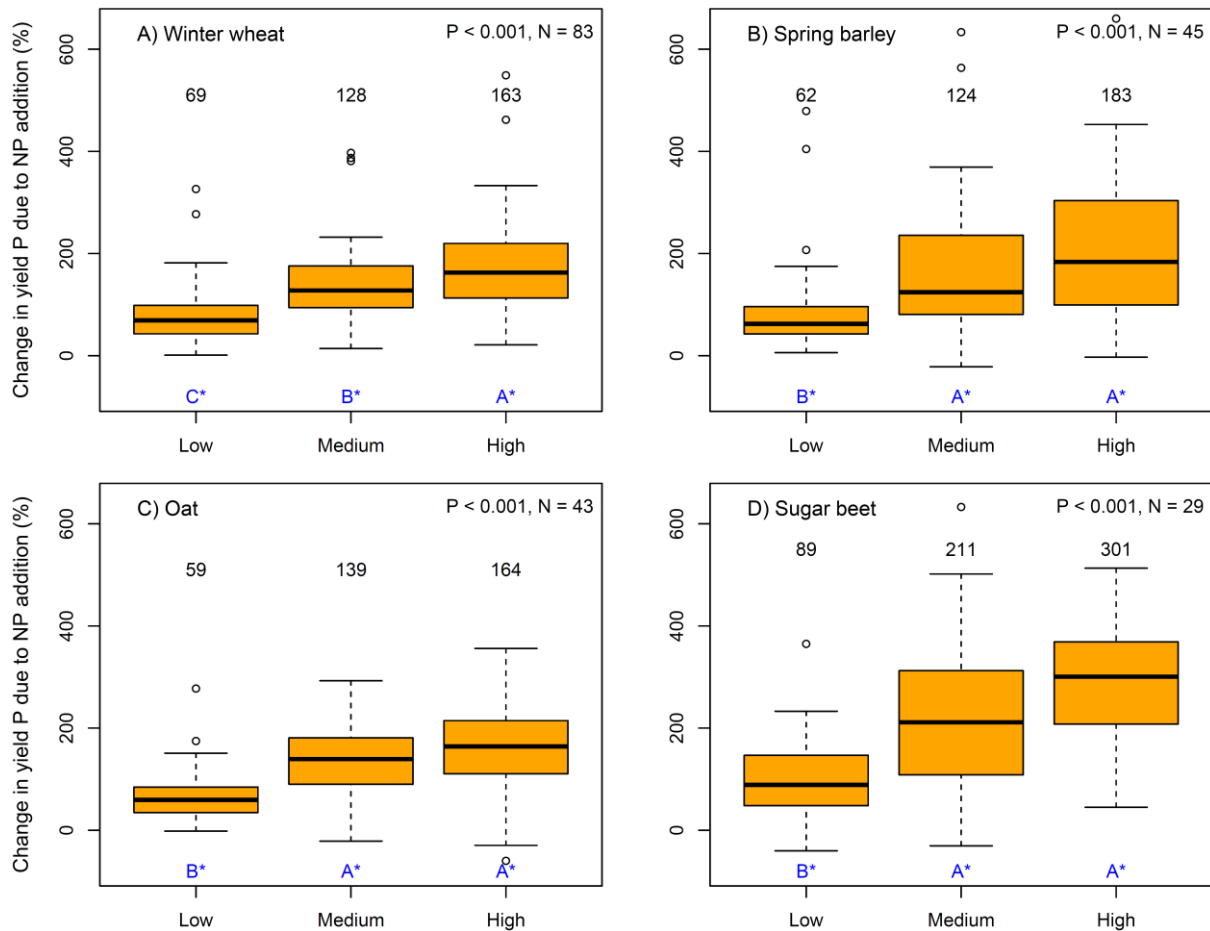


Fig. S2 Change in yield phosphorus (yield P) of the four plant species winter wheat (A), spring barley (B), oat (C), and sugar beet (D) due to combined nitrogen and phosphorus (NP) addition in the three fertilization regimes (low, medium, and high). The change is given in percentage in relation to the yield P in the control treatment. Yield P (in g m^{-2}) was calculated by multiplying the yield with its P content. The number of observations (N) and the P value of the Kruskal-Wallis test is given in the right corner of each panel. Black numbers depict the median. Different blue capital letters indicate significant ($P < 0.05$) differences according to the Dunn post hoc test, tested separately for each crop. Blue asterisks indicate significant ($P < 0.05$) differences compared to the control treatment.