Table 1. Initial soil physico-chemical characteristics (mean ± standard error). Data are the means of three samples

pH (soil:H_2O ratio 1:2.5)	7.1 ± 0.3
Electric conductivity (soil:H_2O ratio 1:5) (dS m^{-1})	0.071 ± 0.06
Coarse sand (g kg^{-1})	418 ± 21
Fine sand (g kg^{-1})	154± 18
Silt (g kg^{-1})	246± 20
Clay (g kg^{-1})	182 ± 17
Total C (g kg^{-1})	8.7 ± 1.5
Kjeldahl-N (g kg^{-1})	0.78 ± 0.13
Olsen P (mg kg^{-1})	11.0 ± 1.3
Available K (mg kg^{-1})	86.4 ± 10.7
Available Ca (mg kg^{-1})	2103 ± 21
Available Mg (mg kg^{-1})	428 ± 13
Available Fe (mg kg^{-1})	80.1 ± 7.9
Available Cu (mg kg^{-1})	4.6 ± 1.1
Available Mn (mg kg^{-1})	119 ± 22
Available Zn (mg kg^{-1})	1.8 ± 0.3

Table 2. Chemical composition (mean ± standard error) of the biostimulant used for each experimental season. Data are the means of three samples (oven wet basis)

Organic matter (g kg^{-1})	459 ± 39
Kjeldahl-N (g kg^{-1})	15.7 ± 1.9
Total carbohydrates (g kg^{-1})	69 ± 10
Total P (g kg^{-1})	29.2 ± 2.2
Total K (g kg^{-1})	1.5 ± 0.5
Total S (g kg^{-1})	18 ± 1.9
Total Ca (g kg^{-1})	110 ± 4
Total Mg (g kg^{-1})	23.9 ± 5.2
Total Fe (mg kg^{-1})	13.5 ± 2.1
Total Cu (mg kg^{-1})	2.1 ± 0.6
Total Mn (mg kg^{-1})	33.8 ± 6.2
Total Zn (mg kg^{-1})	0.59 ± 0.17
Total Ni (mg kg^{-1})	0.53 ± 0.11
Molecular weight (Da) (%)	
> 10000	23.4 ± 2.1
10000 – 5000	8.8 ± 1.0
5000 – 1000	23.2 ± 3.1
1000 – 300	6.9 ± 1.1
< 300	37.7 ± 3.9

Table 3. Amino acid composition (mean ± standard error) of the experimental biostimulant. Data are the means of three samples. Results are expressed as grams per 100 g of proteins

Ala	5.0 ± 0.6	Arg	7.1 ± 0.4
Asp	10.9 ± 1.0	His	1.6 ± 0.3
Cys	ND	Ile	6.1 ± 0.7
Glu	11.8 ± 1.2	Leu	9.1 ± 0.7
Gln	15.6 ± 1.9	Val	8.9 ± 0.8
Gly	8.4 ± 0.8	Lys	2.9 ± 0.5
Pro	9.5 ± 0.6	Met	1.1 ± 0.2
Ser	10.9 ± 1.1	Phe	5.5 ± 0.6
Tyr	1.1 ± 0.2	Thr	4.2 ± 0.9

ND: not determined

Table 4. Chemical composition of the water used in the irrigation crop (mean ± standard error) for each experimental season. Data are the means of six samples

pH	6.4 ± 0.2
Ca^{2+} (mg l^{-1})	96.7 ± 3.4
K^{+} (mg l^{-1})	50.2 ± 3.5
Cl^{-} (mg l^{-1})	3.5 ± 1.6
SO_4^{2-} (mg l^{-1})	33.2 ± 4.1
HCO_3^{2-} (mg l^{-1})	314 ± 10
NO_3^{-} (mg l^{-1})	22.4 ± 2.1

Table 5. Leaf mineral nutrient content (mean ± standard error) (on a dry matter basis) after foliar application of the biostimulant during two consecutive seasons

Treatments	N[↑]	P	K	S	Ca	Mg	Fe	Cu	Mn	Zn	Ni
	(g kg^{-1})						(mg kg^{-1})				
Season 2015											
Tasseling (8th August)											
A0	17.6 ± 1.9a[*]	5.7 ± 1.2a	28.9 ± 2.5a	3.5 ± 1.2a	18.4 ± 2.3a	8.7 ± 1.4a	312 ± 19a	8.4 ± 1.1a	78.2 ± 6.4a	18.3 ± 1.5a	5.3 ± 1.0a
A1	22.5 ± 2.1ab	7.4 ± 1.3b	33.4 ± 2.7ab	5.4 ± 1.3b	26.2 ± 2.0ab	10.2 ± 0.9a	405 ± 24b	10.0 ± 1.4a	87.4 ± 3.9a	25.0 ± 1.9ab	6.7 ± 1.4ab
A2	28.4 ± 1.7b	9.3 ± 1.0b	37.0 ± 2.3b	6.9 ± 1.5c	32.4 ± 2.5b	17.4 ± 1.1b	489 ± 20c	16.6 ± 1.5b	117 ± 4.8b	30.2 ± 2.1b	7.8 ± 1.2b
Harvest (14th October)											
A0	9.5 ± 1.1a	4.3 ± 1.4a	16.6 ± 1.5a	3.4 ± 1.4a	16.9 ± 1.8a	7.8 ± 1.3a	126 ± 11a	6.9 ± 1.5a	63.0 ± 5.2a	17.4 ± 1.3a	4.8 ± 0.9a
A1	11.1 ± 1.8ab	6.4 ± 1.1b	21.4 ± 1.3ab	5.0 ± 1.1b	25.8 ± 2.2ab	10.9 ± 1.5a	265 ± 17b	11.0 ± 1.2ab	78.4 ± 3.5a	23.8 ± 1.6ab	6.3 ± 1.5ab
A2	15.6 ± 1.9b	9.0 ± 1.2c	26.0 ± 1.0b	6.6 ± 1.3c	31.9 ± 2.0b	16.1 ± 1.2b	290 ± 13c	15.1 ± 1.1b	89.3 ± 4.2b	28.4 ± 1.1b	7.9 ± 1.0b
Season 2016											
Tasseling (5th August)											
A0	18.2 ± 2.1a	5.4 ± 1.1a	30.6 ± 1.9a	4.0 ± 1.0a	18.9 ± 1.9a	9.1 ± 1.7a	305 ± 17a	9.1 ± 1.3a	80.2 ± 7.5a	19.4 ± 1.6a	6.0 ± 1.2a
A1	24.6 ± 2.0ab	7.5 ± 1.4b	35.2 ± 2.6ab	5.7 ± 1.2b	25.7 ± 1.7a	10.7 ± 1.5a	386 ± 20b	10.4 ± 1.1a	88.9 ± 5.6a	25.9 ± 2.0ab	6.9 ± 1.1ab
A2	29.3 ± 1.9b	10.0 ± 1.2c	37.6 ± 2.5b	7.1 ± 1.1c	31.2 ± 2.3b	17.8 ± 1.3b	477 ± 25c	17.2 ± 1.5b	119 ± 5.1b	30.4 ± 2.3b	8.0 ± 1.3b
Harvest (20th October)											
A0	10.2 ± 1.4a	4.6 ± 1.0a	19.4 ± 1.6a	3.8 ± 1.1a	17.0 ± 2.0a	8.6 ± 1.5a	139 ± 13a	7.4 ± 1.1a	64.4 ± 5.9a	17.8 ± 1.4a	5.4 ± 1.3a
A1	12.0 ± 1.5ab	6.6 ± 1.2b	23.9 ± 1.8a	5.2 ± 1.2b	24.8 ± 1.7a	11.2 ± 1.3a	274 ± 19b	11.3 ± 1.0ab	77.1 ± 3.8a	23.4 ± 1.0ab	6.5 ± 1.0ab
A2	15.3 ± 1.2b	9.4 ± 1.3c	25.4 ± 1.5b	6.8 ± 1.2c	32.1 ± 1.3b	17.7 ± 1.0b	295 ± 14c	15.4 ± 1.3b	88.7 ± 4.9b	29.2 ± 1.7b	7.7 ± 1.1b

[↑]Fresh matter.

*Columns (mean ± SE) followed by the same letter(s) are not significantly different ($p < 0.05$).

Table 6. Chemical analysis of the grain (mean ± standard error) (on a dry matter basis) after foliar application of the biostimulant during two consecutive seasons

Treatments	N	P	K	S	Ca	Mg	Fe	Cu	Mn	Zn	Ni
	(g kg^{-1})						(mg kg^{-1})				
	Season 2015										
A0	13.9 ± 1.5a*	1.7 ± 0.4a	3.1 ± 0.7a	0.9 ± 0.2a	1.4 ± 0.3a	0.86 ± 0.11a	10.9 ± 1.1a	3.0 ± 0.4a	9.1 ± 0.9a	10.4 ± 1.2a	0.62 ± 0.11a
A1	16.0 ± 1.1ab	2.0 ± 0.2a	3.7 ± 0.8a	1.8 ± 0.4b	2.5 ± 0.5ab	0.97 ± 0.13a	16.0 ± 1.2b	3.9 ± 0.4a	11.0 ± 1.1a	14.2 ±1.1ab	1.0 ± 0.1b
A2	18.8 ± 1.2b	2.6 ± 0.3b	4.2 ± 0.7b	2.8 ± 0.4c	3.0 ± 0.5b	1.1 ± 0.1b	19.3 ± 1.3b	5.7 ± 0.5b	14.0 ± 1.2b	17.9 ± 1.3b	1.3 ± 0.1b
	Season 2016										
A0	14.2 ± 1.2a	1.8 ± 0.3a	3.3 ± 1.0a	1.0 ± 0.2a	1.5 ± 0.3a	0.91 ± 0.17a	11.3 ± 1.4a	3.2 ± 0.5a	10.1 ± 1.1a	10.9 ± 1.5a	0.68 ± 0.12a
A1	16.3 ± 1.3ab	2.0 ± 0.3a	3.8 ± 1.1a	1.9 ± 0.3b	2.7 ± 0.5b	1.0 ± 0.1a	16.7 ± 1.3b	4.0 ± 0.6a	12.1 ± 1.3a	14.0 ± 1.2ab	1.1 ± 0.1b
A2	19.0 ± 1.4b	2.5 ± 0.2b	4.4 ± 0.8b	2.9 ± 0.4c	3.1 ± 0.4b	1.2 ± 0.1b	20.2 ± 1.4c	6.0 ± 0.5b	14.2 ± 1.4b	18.2 ± 1.2b	1.3 ± 0.1b

*Columns (mean ± SE) followed by the same letter(s) are not significantly different ($p < 0.05$).

Table 7. Grain protein content and crop yield parameters (mean ± standard error) after foliar application of the biostimulant during two consecutive seasons

Treatments	Protein concentration ($g\ kg^{-1}$)	Number of grains per corncob	Yield ($kg\ ha^{-1}$)
	Season 2015		
A0	86.8 ± 9.1a*	470 ± 31a	14118 ± 124a
A1	100.0 ± 6.6ab	516 ± 23ab	15510 ± 110b
A2	118.1 ± 7.4b	553 ± 28b	16303 ± 135b
	Season 2016		
A0	88.8 ± 7.3a	474 ± 33a	14229 ± 156a
A1	101.9 ± 8.0ab	522 ± 27ab	15532 ± 120b
A2	118.8 ± 8.6b	563 ± 31b	16663 ± 144b

*Columns (mean ± SE) followed by the same letter(s) are not significantly different ($p < 0.05$)