

## Article

# Effect of Nitrogen Fertilisation and Inoculation with *Bradyrhizobium japonicum* on the Fatty Acid Profile of Soybean (*Glycine max* (L.) Merrill) Seeds

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**Table S1.** FA composition of *G. max* seeds (g FA · 100 g seeds<sup>-1</sup>), mean values for interaction cultivar × fertilisation.

Cultivar	Fertilisation (kg·ha <sup>-1</sup> N)	C18:0	C18:1n9	C18:2n6	C18:3n6	C18:3n3	C14:0	C16:0	C16:1	C20:0	C20:1
Aldana	0	3.17 ±0.13	20.0 ±3.07	52.3 ±1.13	0.079 ±0.054	8.89 ±0.61	0.173 ±0.138	12.7 ±1.80	0.147 ±0.027	0.275 ±0.033	0.189 ±0.027
	30	3.11 ±0.21	19.7 ±2.35	52.5 ±1.83	0.088 ±0.047	8.89 ±0.70	0.167 ±0.095	12.9 ±1.25	0.152 ±0.023	0.249 ±0.052	0.177 ±0.045
	60	3.14 ±0.27	20.3 ±2.97	51.9 ±1.87	0.073 ±0.044	8.78 ±0.89	0.154 ±0.103	13.1 ±0.94	0.170 ±0.050	0.252 ±0.027	0.169 ±0.033
Annushka	0	3.35 ±0.28	18.3 ±2.54	53.4 ±1.22	0.088 ±0.044	9.07 ±0.76	0.162 ±0.085	12.8 ±1.65	0.134 ±0.027	0.314 ±0.080	0.204 ±0.063
	30	3.26 ±0.28	17.9 ±1.88	53.3 ±1.93	0.088 ±0.047	9.05 ±0.86	0.162 ±0.078	13.6 ±1.25	0.133 ±0.021	0.268 ±0.044	0.164 ±0.029
	60	3.24 ±0.23	17.9 ±1.71	53.1 ±1.30	0.081 ±0.051	8.96 ±0.84	0.153 ±0.075	13.7 ±0.75	0.149 ±0.041	0.265 ±0.039	0.182 ±0.036
Cultivar × Fertilisation		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

\*Values are expressed as mean ± SD. Means in a column followed by different letters show significant differences ( $p < 0.05$ ) according to the Tukey test. NS not significant.

**Table S2.** FA composition of *G. max* seeds (g FA · 100 g seeds<sup>-1</sup>), mean values for interaction fertilisation × inoculation.

Fertilisation (kg·ha <sup>-1</sup> N)	Inoculated	C18:0	C18:1n9	C18:2n6	C18:3n6	C18:3n3	C14:0	C16:0	C16:1	C20:0	C20:1
0	Without inoculation	3.18 ±0.22	18.6 ±3.20	52.9 ±1.21	0.093 ±0.053	8.93 ±0.66	0.186 ±0.099	13.5 ±1.57	0.146 ±0.033	0.271 ±0.043	0.180 ±0.043
	HiStick®Soy	3.33 ±0.19	19.7 ±3.24	52.9 ±1.43	0.075 ±0.033	8.97 ±0.78	0.126 ±0.094	12.2 ±1.91	0.136 ±0.031	0.322 ±0.090	0.213 ±0.060
	Nitra-gina	3.27 ±0.28	19.1 ±2.45	52.7 ±1.77	0.081 ±0.061	9.04 ±0.69	0.190 ±0.142	12.5 ±1.52	0.139 ±0.017	0.293 ±0.042	0.197 ±0.038
30	Without inoculation	3.19 ±0.28	18.5 ±1.49	52.8 ±1.22	0.079 ±0.050	9.00 ±0.77	0.158 ±0.089	13.9 ±1.23	0.151 ±0.021	0.258 ±0.068	0.177 ±0.047
	HiStick®Soy	3.23 ±0.23	19.2 ±3.02	53.2 ±1.56	0.106 ±0.056	9.00 ±0.85	0.170 ±0.066	12.5 ±1.53	0.131 ±0.015	0.272 ±0.036	0.173 ±0.030
	Nitragina	3.13 ±0.27	18.8 ±2.31	52.7 ±1.93	0.076 ±0.025	8.92 ±0.81	0.166 ±0.107	13.3 ±0.52	0.146 ±0.030	0.245 ±0.036	0.162 ±0.038
60	Without inoculation	3.22 ±0.19	19.2 ±2.73	52.8 ±1.30	0.067 ±0.025	9.02 ±0.79	0.122 ±0.054	13.2 ±1.18	0.147 ±0.040	0.261 ±0.027	0.171 ±0.020
	HiStick®Soy	3.19 ±0.21	19.3 ±3.24	51.9 ±2.39	0.086 ±0.061	8.71 ±1.08	0.201 ±0.090	13.5 ±0.60	0.177 ±0.058	0.253 ±0.031	0.179 ±0.039
	Nitragina	3.16 ±0.27	18.8 ±2.28	52.8 ±2.14	0.080 ±0.051	8.88 ±0.75	0.137 ±0.102	13.5 ±0.89	0.154 ±0.037	0.261 ±0.044	0.177 ±0.043
Fertilisation × Inoculation		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

\*Values are expressed as mean ± SD. Means in a column followed by different letters show significant differences (< 0.05) according to the Tukey test. NS not significant.

**Table S3.** FA composition of *G. max* seeds (g FA · 100 g seeds<sup>-1</sup>), mean values for interaction inoculation × years.

Inoculated	Years	C18:0	C18:1n9	C18:2n6	C18:3n6	C18:3n3	C14:0	C16:0	C16:1	C20:0	C20:1
Without inoculation	2016	3.20 ±0.13	17.1 ±1.39	54.4 ±0.53	0.123 ±0.037	9.21 ±0.30	0.175±0.037	13.8 ±0.42	0.124 ±0.016	0.263 ±0.017	0.167 ±0.022
	2017	3.38 ±0.17	18.7 ±0.78	52.5 ±0.27	0.099 ±0.040	8.37 ±0.28	0.207 ±0.061	13.5 ±0.77	0.148 ±0.014	0.295 ±0.038	0.207 ± 0.045
	2018	2.91 ±0.14	21.8 ±2.94	51.8 ±1.10	0.050 ±0.030	8.42 ±0.33	0.171±0.100	12.9 ±1.46	0.144 ±0.032	0.247 ±0.078	0.168 ±0.035
	2019	3.30 ±0.10	17.5 ±0.82	52.7 ±0.79	0.048 ±0.011	9.94 ±0.19	0.069±0.056	14.0 ±0.49	0.176 ±0.037	0.248 ±0.043	0.163 ±0.033
HiStick®Soy	2016	3.14 ±0.11	17.1 ±1.22	54.9 ±0.74	0.072 ±0.032	9.49 ±0.19	0.145±0.016	13.3 ±0.28	0.124 ±0.011	0.253 ±0.010	0.165 ±0.006
	2017	3.43 ±0.13	18.8 ±0.79	52.1 ±0.70	0.127 ±0.062	8.36 ±0.21	0.258 ±0.043	13.5 ±0.48	0.156 ±0.025	0.305 ±0.034	0.212 ±0.025
	2018	3.06 ± 0.18	23.9 ±2.24	50.7 ±1.57	0.090 ±0.062	7.90 ±0.62	0.168 ±0.091	11.1 ±1.15	0.158 ±0.080	0.320 ±0.050	0.225 ±0.059
	2019	3.38 ±0.16	17.8 ±0.92	53.0 ±0.92	0.067 ±0.025	9.82 ±0.36	0.093±0.082	13.0 ±1.14	0.154 ± 0.017	0.250 ±0.048	0.150 ±0.034
Nitragina	2016	3.13 ±0.11	17.1 ±1.16	54.4 ±0.87	0.100 ±0.042	9.36 ±0.19	0.160 ±0.039	13.4 ± 0.35	0.130 ±0.019	0.258 ±0.016	0.175 ±0.010
	2017	3.36 ±0.18	18.5 ±0.79	51.9 ±0.52	0.118 ± 0.053	8.34 ±0.31	0.289 ± 0.121	13.5 ±0.37	0.164 ±0.026	0.300 ±0.032	0.215 ±0.045
	2018	2.88 ±0.18	22.1 ±1.77	51.6 ±1.60	0.050 ±0.025	8.31 ±0.47	0.146 ±0.084	12.5 ±1.56	0.147 ±0.040	0.262 ±0.062	0.183 ±0.043
	2019	3.38 ±0.24	18.1 ±1.03	53.1 ±1.44	0.048 ±0.010	9.77 ±0.29	0.062 ±0.077	13.1 ±1.44	0.145 ±0.020	0.243 ±0.039	0.143 ±0.026
Inoculation × Years		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

\*Values are expressed as mean ± SD. Means in a column followed by different letters show significant differences (p<0.05) according to the Tukey test. NS not significant.

**Table S4.** Content of SFA, UFA, MUFA and PUFA (g FA·100 g seeds<sup>-1</sup>) as well as the ratio of SFA/UFA and C18:2n6/C18: 3n3 in *G. max* seeds, mean values for interaction cultivar × fertilisation.

Cultivar	Fertilisation (kg·ha <sup>-1</sup> N)	SFA	MUFA	UFA	PUFA	SFA/UFA	C18:2n6/C18:3n3
Aldana	0	17.6 ± 1.40	20.5 ± 3.06	82.6 ± 1.81	61.7 ± 2.47	0.21 ± 0.03	5.91 ± 0.39
	30	17.6 ± 1.51	20.2 ± 2.38	81.6 ± .99	61.3 ± 2.03	0.23 ± 0.03	5.92 ± 0.47
	60	17.8 ± 1.18	20.8 ± 3.00	81.9 ± 1.22	61.6 ± 1.78	0.22 ± 0.02	5.96 ± 0.50
Annushka	0	17.8 ± 1.96	18.8 ± 2.58	81.1 ± 1.72	62.4 ± 2.31	0.23 ± 0.03	5.91 ± 0.40
	30	18.4 ± 1.34	18.4 ± 1.88	81.3 ± 1.45	62.8 ± 1.81	0.23 ± 0.02	5.94 ± 0.41
	60	18.8 ± 1.49	18.4 ± 1.76	81.7 ± 1.71	63.2 ± 1.97	0.22 ± 0.03	5.96 ± 0.48
Cultivar × Fertilisation		NS	NS	NS	NS	NS	NS

\*Values are expressed as mean ± SD. Means in a column followed by different letters show significant differences ( $p < 0.05$ ) according to the Tukey test. NS not significant.

**Table S5.** Content of SFA, UFA, MUFA and PUFA (g FA·100 g seeds<sup>-1</sup>) as well as the ratio of SFA/UFA and C18:2n6/C18: 3n3 in *G. max* seeds, mean values for interaction cultivar × inoculation.

Cultivar)	Inoculated	SFA	MUFA	UFA	PUFA	SFA/UFA	C18:2n6/C18:3n3
Aldana	Without inoculation	17.7 ± 1.91	20.2 ± 2.87	82.1 ± 1.89	61.4 ± 2.42	0.22 ± 0.03	5.90 ± 0.42
	HiStick®Soy	17.1 ± 1.84	20.8 ± 3.23	81.8 ± 1.54	61.3 ± 2.25	0.22 ± 0.02	5.9 ± 0.49
	Nitragina	18.2 ± 1.31	20.4 ± 2.30	82.2 ± 1.80	62.0 ± 1.51	0.22 ± 0.03	5.94 ± 0.44
Annushka	Without inoculation	18.9 ± 1.07	18.2 ± 1.60	81.1 ± 1.30	62.7 ± 1.97	0.23 ± 0.02	5.93 ± 0.46
	HiStick®Soy	18.2 ± 1.99	18.9 ± 2.70	81.8 ± 1.70	62.9 ± 2.01	0.22 ± 0.03	5.97 ± 0.45
	Nitragina	17.9 ± 1.68	18.4 ± 1.79	81.2 ± 1.83	62.7 ± 2.21	0.23 ± 0.03	5.91 ± 0.38
Cultivar × Inoculation		NS	NS	NS	NS	NS	NS

\*Values are expressed as mean ± SD. Means in a column followed by different letters show significant differences ( $p < 0.05$ ) according to the Tukey test. NS not significant.

**Table S6.** Content of SFA, UFA, MUFA and PUFA (g FA·100 g seeds<sup>-1</sup>) as well as the ratio of SFA/UFA and C18:2n6/C18: 3n3 in *G. max* seeds, mean values for interaction inoculation × years.

Inoculated	Year	SFA	MUFA	UFA	PUFA	SFA/UFA	C18:2n6/C18:3n3
Without inoculation	2016	18.2 ± 0.63	17.5 ± 1.25	81.7 ± 0.79	64.2 ± 0.74	0.22 ± 0.01	5.91 ± 0.15
	2017	19.2 ± 0.90	19.2 ± 0.94	80.2 ± 0.89	64.4 ± 1.15	0.25 ± 0.01	6.28 ± 0.23
	2018	16.8 ± 1.49	22.3 ± 1.24	83.0 ± 2.45	64.4 ± 0.98	0.21 ± 0.04	6.16 ± 0.27
	2019	18.9 ± 0.90	17.9 ± 0.9	81.4 ± 0.95	61.2 ± 0.31	0.23 ± 0.02	5.30 ± 0.13
HiStick®Soy	2016	17.5 ± 0.32	17.5 ± 1.34	81.8 ± 0.39	61.0 ± 0.21	0.22 ± 0.01	5.79 ± 0.07
	2017	19.2 ± 0.94	19.3 ± 0.84	80.3 ± 0.72	60.9 ± 0.61	0.25 ± 0.01	6.23 ± 0.23
	2018	15.8 ± 1.76	24.5 ± 1.44	83.3 ± 2.11	59.3 ± 2.15	0.20 ± 0.03	6.44 ± 0.36
	2019	18.2 ± 1.36	18.3 ± 0.66	81.6 ± 1.01	59.9 ± 2.54	0.23 ± 0.02	5.40 ± 0.14
Nitragina	2016	17.9 ± 0.48	17.5 ± 1.15	82.0 ± 0.53	61.1 ± 1.55	0.22 ± 0.01	5.82 ± 0.06
	2017	19.5 ± 0.49	19.1 ± 0.48	80.4 ± 0.84	63.4 ± 0.89	0.24 ± 0.01	6.23 ± 0.21
	2018	16.8 ± 1.83	22.5 ± 1.77	83.6 ± 2.32	63.1 ± 1.05	0.20 ± 0.03	6.22 ± 0.41
	2019	18.0 ± 1.35	18.5 ± 1.19	81.0 ± 1.58	62.9 ± 1.76	0.23 ± 0.02	5.44 ± 0.11
Inoculation × Years		NS	NS	NS	NS	NS	NS

\*Values are expressed as mean ± SD. Means in a column followed by different letters show significant differences ( $p < 0.05$ ) according to the Tukey test. NS not significant.