

Table S1 Standard error of the mean (SEM) and *F*-test results of the crude protein, mucilage and crude oil content of chia (Genotype G8) cultivated at three different row spacing (35, 50, 75 cm), sowing densities (1, 1.5, 2 kg ha⁻¹) and fertilizer rates (0,20 40 kg N ha⁻¹) at Ihinger Hof in 2016 and 2017 (n = 3, $\alpha = 0.05$).

Trait	j_a	b_{aj}	F-test	
			τ_k	$(j\tau)_{ak}$
Row spacing				
Crude protein	0.0018	0.8438	0.2011	0.2527
Mucilage	<0.0001	0.8174	0.1933	0.0549
Crude oil	0.188	0.2723	0.0216	0.9737
Sowing density				
Crude protein	<0.0001	0.7807	0.8068	0.0969
Mucilage	<0.0001	0.8471	0.0334	0.0003
Crude oil	0.0020	0.1251	0.0309	0.0281
Fertilizer rate				
Crude protein	<0.0001	0.2119	0.3625	0.6330
Mucilage	<0.0001	0.9137	0.0018	0.0584
Crude oil	<0.0001	0.0813	0.0009	0.6955

p-values from F-tests are based on model (2); j_a Annual effect; b_{aj} Block effect; τ_k Treatment effect (row spacing, sowing density, fertilizer rate); $(j\tau)_{ak}$ Interaction between treatment and annual effect. ter display: Estimates at a constant level of the treatment factor that share a capital letter do not differ significantly between years at $\alpha = 0.05$. Estimates within a year that share a small letter do not differ significantly between treatment factor levels at $\alpha = 0.05$.

Table S2 Mean estimates of fatty acid composition (% of total fatty acid) of chia (Genotypes G8) cultivated at three different levels of sowing density (1, 1.5, 2 kg ha⁻¹) at Ihinger Hof in 2016 and 2017, along with standard error of the mean (SEM) and *F*-tests.

Trait	Year 2016			Year 2017			<i>F</i> -test				
	1	1.5	2	1	1.5	2	SEM	j_a	b_{aj}	τ_k	$(j\tau)_{ak}$
Palmitic acid	6.90 A/a	7.08 A/a	7.08 A/a	6.67 B/a	6.71 B/a	6.82 B/a	0.077	0.0009	0.6144	0.1285	0.6539
Stearic acid	3.45 A/a	3.49 A/a	3.40 A/a	2.99 B/a	3.10 B/a	3.21 B/a	0.069	<0.0001	0.1646	0.4589	0.1855
Oleic acid	7.46 A/a	7.59 A/a	7.43 A/a	5.82 B/a	5.94 B/a	6.05 B/a	0.177	<0.0001	0.0986	0.1855	0.7268
Vaccenic acid	0.82 A/a	0.77 A/a	0.75 A/a	0.80 A/a	0.79 A/a	0.79 A/a	0.026	0.5205	0.3167	0.0971	0.3661
Linoleic acid	20.75 A/a	21.15 A/a	20.95 A/a	20.07 B/a	19.97 B/a	19.75 B/a	0.181	<0.0001	0.0014	0.5471	0.3145
α -Linolenic acid	60.59 A/a	59.91 A/a	60.33 A/a	63.66 B/a	63.49 B/a	63.39 Ba	0.488	<0.0001	0.0048	0.6451	0.8329
SFA	10.35 A/a	10.58 A/a	10.48 A/a	9.66 B/a	9.81 B/a	10.03 B/a	0.129	<0.0001	0.2659	0.1712	0.4705
MUFA	8.28 A/a	8.36 A/a	8.19 A/a	6.62 B/a	6.73 B/a	6.83 B/a	0.206	<0.0001	0.0206	0.8634	0.7105
PUFA	81.34 A/a	81.06 A/a	81.30 A/a	83.72 B/a	83.46 B/a	83.14 B/a	0.464	<0.0001	0.1839	0.1206	0.6752
PUFA:SFA	7.87 A/a	7.67 A/a	7.78 A/a	8.67 B/a	8.51 B/a	8.29 B/a	0.129	<0.0001	0.2119	0.1985	0.4443
ω 6: ω 3	0.34 A/a	0.35 A/a	0.35 A/a	0.32 B/a	0.32 B/a	0.31 B/a	0.006	<0.0001	0.0011	0.6414	0.6074

Estimates, average standard errors of the mean (SEM) and *p*-values from *F*-tests are based on model (2); j_a Annual effect; b_{aj} Block effect; τ_k Treatment effect (sowing density); $(j\tau)_{ak}$ Interaction between treatment and annual effect; Letter display: Estimates at a constant level of the treatment factor that share a capital letter do not differ significantly between years at $\alpha = 0.05$. Estimates within a year that share a lowercase letter do not differ significantly between treatment factor levels at $\alpha = 0.05$.

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Table S3 Mean estimates of fatty acid composition (% of total fatty acid) of chia (Genotypes G8) cultivated at three different fertilizer rates (0, 20, 40 kg N ha⁻¹) at Ihinger Hof in 2016 and 2017, along with standard error of the mean (SEM) and *F*-tests.

Trait	Year 2016			Year 2017			SEM	<i>F</i> -test				
	Fertilizer	0	20	40	0	20		40	j_a	b_{aj}	τ_k	$(j\tau)_{ak}$
Palmitic acid		7.10 A/a	7.48 A/a	7.35 A/a	6.72 B/a	6.72 B/a	6.98 B/a	0.089	0.0003	0.4926	0.0943	0.0944
Stearic acid		3.61 A/a	3.75 A/a	3.72A/a	3.13 B/a	3.07 B/a	3.18 B/a	0.098	<0.0001	0.3426	0.7174	0.6166
Oleic acid		7.60 A/a	8.19 A/a	7.96 A/a	5.91 B/a	5.94 B/a	6.11 B/a	0.209	<0.0001	0.0271	0.3133	0.4296
Vaccenic acid		0.76 A/a	0.78 A/a	0.76 A/a	0.79 B/a	0.79 B/a	0.81 B/a	0.010	0.0182	0.9659	0.6623	0.1807
Linoleic acid		21.20 A/a	21.64 A/a	21.51 A/a	19.84 B/a	19.81 B/a	19.83 B/a	0.324	<0.0001	0.1812	0.9810	0.6368
α -Linolenic acid		59.72 A/a	58.15 A/a	58.70 A/a	63.61 B/a	63.67 B/a	63.09 B/a	0.192	<0.0001	0.2232	0.1876	0.4191
SFA		10.71 A/a	11.24 A/a	11.07 A/a	9.85 B/a	9.79 B/a	10.16 B/a	0.167	<0.0001	0.3733	0.2211	0.2129
MUFA		8.37 A/a	8.97 A/a	8.72 A/a	6.70 B/a	6.73 B/a	6.92 B/a	0.211	<0.0001	0.0300	0.3041	0.4010
PUFA		80.91 A/a	79.79 A/a	80.21 A/a	83.45 B/a	83.48 B/a	82.92 B/a	0.364	<0.0001	0.1013	0.2554	0.2858
PUFA:SFA		7.58 A/a	7.10 A/a	7.25 A/a	8.47 B/a	8.53 B/a	8.17 B/a	0.154	<0.0001	0.3185	0.2100	0.2083
ω 6: ω 3		0.36 A/a	0.37 A/a	0.37 A/a	0.31 B/a	0.31 B/a	0.31 B/a	0.006	<0.0001	0.1804	0.5279	0.5498

Estimates, average standard errors of the mean (SEM) and *p*-values from *F*-tests are based on model (2); j_a Annual effect; b_{aj} Block effect; τ_k Treatment effect (fertilizer rate); $(j\tau)_{ak}$ Interaction between treatment and annual effect; Letter display: Estimates at a constant level of the treatment factor that share a capital letter do not differ significantly between years at $\alpha = 0.05$. Estimates within a year that share a lowercase letter do not differ significantly between treatment factor levels at $\alpha = 0.05$.