

**Table S1.** Analysis of statistical significance (p-value) of sowing date and N-P fertilization for fresh weight, oil content and oil yield.

Parameter	Fertilization (F)	Date of sowing (D)	Fertilization x Date of sowing (D x F)
Fresh weight (g per plant) in the first cut	p < 0.001	p < 0.001	p < 0.001
Fresh weight (g per plant) in the second cut	p < 0.001	p < 0.001	p = 0.001
Oil content (mL/100g FW) in the first cut	p < 0.001	p < 0.001	p < 0.001
Oil content (mL/100g FW) in the second cut	p < 0.001	p < 0.001	p = 0.050
Oil yield (mL per plant FW) in the first cut	p < 0.001	p < 0.001	p < 0.001
Oil yield (mL per plant FW) in the second cut	p < 0.001	p < 0.001	p = 0.001

**Table S2.** Effect of fertilization with N and P as well as their combination on the trace constituents of *S. montana* essential oil at 2<sup>nd</sup> cut in the second season during planting dates at 2<sup>nd</sup> cut in the second season.

Component	N0_P0	N0_P37	N0_P74	N55_P0	N55_P37	N55_P74	N110_P0	N110_P37	N110_P74
<b>October</b>									
$\alpha$ -thujene	0.21	0.24	0.22	0.24	0.26	0.21	0.41	0.20	0.19
$\alpha$ -pinene	0.59	0.70	0.97	0.34	0.71	0.59	0.53	0.68	0.58
$\beta$ -pinene	0.58	0.68	0.57	0.80	0.49	0.86	0.77	0.44	0.90
1-octen-3-ol	0.65	0.51	0.32	0.50	0.40	0.57	0.38	0.58	0.42
$\alpha$ -Phellandrene	0.54	0.53	0.60	0.46	0.44	0.61	0.32	0.11	0.27
$\beta$ -myrcene	0.45	0.33	0.77	0.65	0.76	0.54	0.42	0.56	0.32
$\alpha$ -terpinene	0.76	0.52	0.76	0.78	0.13	0.21	0.11	0.14	0.61
limonene	0.75	0.21	0.23	0.43	0.31	0.42	0.50	0.22	0.33
eucalyptol	0.17	0.25	0.21	0.22	0.42	0.20	0.12	0.58	0.46
1-terpinen-4-ol	0.60	0.45	0.38	0.71	0.62	0.97	0.88	0.87	0.85
Germacrene D	0.61	0.55	0.40	0.32	0.52	0.31	0.19	0.21	0.21
caryophyllene oxide	0.34	0.24	0.60	0.52	0.66	0.33	0.48	0.44	0.23
<b>March</b>									
$\alpha$ -thujene	0.21	0.24	0.22	0.24	0.26	0.21	0.41	0.20	0.19
$\alpha$ -pinene	0.59	0.70	0.97	0.34	0.71	0.59	0.53	0.68	0.58
$\beta$ -pinene	0.58	0.68	0.57	0.80	0.49	0.86	0.77	0.44	0.90
1-octen-3-ol	0.65	0.51	0.32	0.50	0.40	0.57	0.38	0.58	0.42
$\alpha$ -Phellandrene	0.54	0.53	0.60	0.46	0.44	0.61	0.32	0.11	0.27
$\beta$ -myrcene	0.45	0.33	0.77	0.65	0.76	0.54	0.42	0.56	0.32
$\alpha$ -terpinene	0.76	0.52	0.76	0.78	0.13	0.21	0.11	0.14	0.61
limonene	0.75	0.21	0.23	0.43	0.31	0.42	0.50	0.22	0.33
eucalyptol	0.17	0.25	0.21	0.22	0.42	0.20	0.12	0.58	0.46
1-terpinen-4-ol	0.60	0.45	0.38	0.71	0.62	0.97	0.88	0.87	0.85
Germacrene D	0.61	0.55	0.40	0.32	0.52	0.31	0.19	0.21	0.21
caryophyllene oxide	0.34	0.24	0.60	0.52	0.66	0.33	0.48	0.44	0.23

**Table S3.** Effect of sowing date and fertilization with N and P as well as their combination on the major chemical compound groups of *S. montana* essential oil at 2<sup>nd</sup> cut in the second season.

Fertilization (F)	Monoterpene hydrocarbones		Monoterpenes oxygenated		Sesquiterpene hydrocarbones		Sesquiterpenes oxygenated	
	Date of sowing (D)							
	Oct	Mar	Oct	Mar	Oct	Mar	Oct	Mar
N0_P0	19.98	19.98	70.57	69.84	2.02	2.24	0.34	0.65
N0_P37	16.62	16.21	71.88	73.06	1.75	2.42	0.52	0.62
N0_P74	13.14	12.51	73.53	74.54	1.83	1.68	0.66	0.54
N55_P0	18.13	17.41	70.62	70.80	1.88	2.46	0.24	0.62
N55_P37	12.31	11.76	76.47	76.53	3.24	2.86	0.33	0.48
N55_P74	11.63	11.87	77.84	79.00	2.93	2.75	0.48	0.29
N110_P0	18.14	18.13	70.30	72.02	2.79	2.73	0.60	0.55
N110_P37	9.24	9.88	81.68	82.29	3.02	2.12	0.44	0.47
N110_P74	9.72	8.97	84.41	84.71	1.61	2.21	0.23	0.19