

Supplementary Table 1. List of genes, primers, source, and efficiency values (E%) used in this study.

Gene	Gene ID	Full Name	Forward Primer (5'-3')	Reverse Primer (3'-5')	Source	E%
Target Genes						
<i>FvLHY</i>	gene18601	Late Elongated Hypocotyl	CACTCAGAAGCTGTGCAAGC	GTAAGTGGACTCAGAAGCTG	Chen et al. 2018	91.36
<i>FvPRR9</i>	gene18611	Two-component response regulator-like PRR9	GTAGCAGGTGAGATGGCCAC	CAATGTGAGCTCTATGCACG	Chen et al. 2018	109.29
<i>FvPRR7</i>	gene18151	Two-component response regulator-like PRR 7	CTGCAGCAGCTCCACATTGC	CGAGGTGCGTGTCTGCTAG	Chen et al. 2018	106.36
<i>FvRVE8</i>	gene18104	Reveille 8	GTCACAAGCTCATGTGCGCCA	CTGCTGAGCTATAGTCCGAAG	Chen et al. 2018	94.06
<i>FvPRR5</i>	gene12454	Two-component response regulator-like PRR 5	CTGCAATGGCAATGCAAGTC	GAAGGATCAGTAACTTGACG	Chen et al. 2018	112.02
<i>FvTOC1/PRR1</i>	gene26055	Timing of CAB 1/ Two-component response regulator-like PRR1	CCGTCCGATCAGTCTCTTC	CTCGACTCGTCGTTATCGCA	NCBI Primer-Blast	109.56
<i>FvLUX/PCL1</i>	gene30204	Transcription factor Lux arrhythmo/ Phyto clock 1	ACTTGCAGAAGTACCGCCTC	CGCAACATGTGGTTGGTACG	NCBI Primer-Blast	114.43
Reference Genes						
<i>FvGAPDH</i>	gene07104	Glyceraldehyde-3-Phosphate Dehydrogenase	CAGAAGACTGTTGATGGACC	GCAGCCTTAATCTGGTCATAG	Chen et al. 2018	89.35
<i>FvMSII</i>	gene03001	WD-40 repeat protein Multicopy Suppressor of IRA1	TCCCCACACCTTTGATTGCCA	ACACCATCAGTCTCCTGCCAAG	Mouhu et al. 2013	117.20

Supplementary Table 2. Significant differences between treatments within each accession.

LHY							
Treatment_1	Treatment_2	Accession	ZT	meandiff	lower	upper	p-adj
Mid-latitude	Arctic	IT1	0	7.23	1.46	13.01	0.002
		IT4	0	0.48	0.25	0.71	0.001
		NOR13	0	1.31	0.59	2.04	0.001
		IT1	4	6.95	1.50	12.39	0.002
		IT1	24	8.84	1.82	15.87	0.002
		IT4	24	0.46	0.14	0.77	0.001
		NOR13	24	0.85	0.01	1.69	0.043
Arctic	D-Arctic	IT1	4	7.82	1.53	14.10	0.002
		IT4	4	0.38	0.10	0.66	0.001
		NOR2	4	8.04	1.35	14.73	0.004
		IT1	8	7.99	1.91	14.08	0.001
		IT4	8	0.30	0.02	0.58	0.026
Mid-latitude	D-Mid-latitude	IT4	4	-0.31	-0.59	-0.03	0.017
		NOR2	8	-11.13	-17.82	-4.44	0.001
		IT1	24	10.06	2.21	17.92	0.001
		IT4	24	0.63	0.28	0.98	0.001
		NOR13	24	1.02	0.09	1.96	0.018
D-Arctic	D-Mid-latitude	IT1	8	-8.58	-15.60	-1.55	0.003
		IT4	8	-0.36	-0.68	-0.05	0.007
RVE8							
Treatment_1	Treatment_2	Accession	ZT	meandiff	lower	upper	p-adj
Mid-latitude	Arctic	IT4	0	0.53	0.22	0.84	0.001
		NOR13	0	1.30	0.47	2.13	0.001
Mid-latitude	D-Mid-latitude	NOR2	8	-0.76	-1.33	-0.20	0.001
PRR9							
Treatment_1	Treatment_2	Accession	ZT	meandiff	lower	upper	p-adj
Mid-latitude	Arctic	IT1	4	0.73	0.01	1.45	0.040
		IT4	4	0.35	0.07	0.64	0.002
		NOR2	4	0.75	0.28	1.22	0.001
		NOR13	4	0.52	0.07	0.96	0.007
		IT1	8	1.23	0.58	1.89	0.001
		IT4	8	0.78	0.50	1.07	0.001

		NOR2	8	0.69	0.22	1.16	0.001
		NOR13	8	1.03	0.59	1.47	0.001
Arctic	D-Arctic	IT1	8	-1.00	-1.80	-0.20	0.002
		IT4	8	-0.43	-0.75	-0.10	0.001
		NOR2	8	-0.61	-1.18	-0.04	0.024
		NOR13	8	-0.67	-1.16	-0.19	0.001
		IT4	12	-0.39	-0.76	-0.02	0.031
		NOR13	12	-0.65	-1.13	-0.16	0.001
Mid-latitude	D-Mid-latitude	IT4	4	0.44	0.11	0.76	0.001
		NOR2	4	0.82	0.24	1.39	0.001
		NOR13	4	0.62	0.10	1.15	0.005
		IT1	8	2.08	1.27	2.88	0.001
		IT4	8	1.14	0.81	1.46	0.001
		NOR2	8	0.94	0.37	1.51	0.001
		NOR13	8	1.63	1.11	2.16	0.001
PRR7							
Treatment_1	Treatment_2	Accession	ZT	meandiff	lower	upper	p-adj
Mid-latitude	Arctic	IT4	12	0.36	0.01	0.70	0.032
		NOR13	20	-0.60	-1.14	-0.07	0.010
PRR5							
Treatment_1	Treatment_2	Accession	ZT	meandiff	lower	upper	p-adj
Mid-latitude	Arctic	IT1	8	0.80	0.43	1.17	0.001
		IT4	8	1.92	0.82	3.02	0.001
		NOR13	8	2.42	0.38	4.46	0.005
		IT4	16	-1.11	-2.10	-0.12	0.013
Arctic	D-Arctic	IT4	12	-1.53	-2.90	-0.15	0.014
Mid-latitude	D-Mid-latitude	IT1	8	0.80	0.35	1.25	0.001
		IT4	8	1.92	0.55	3.29	0.001
		NOR13	8	3.00	0.59	5.41	0.002
		IT4	12	1.47	0.27	2.67	0.003
LUX							
Treatment_1	Treatment_2	Accession	ZT	meandiff	lower	upper	p-adj
Arctic	Mid-latitude	IT4	12	0.09	0.02	0.15	0.001
		NOR13	12	0.13	0.02	0.24	0.010
		NOR13	20	-0.14	-0.26	-0.02	0.004
Arctic	D-Arctic	IT1	12	-0.11	-0.19	-0.03	0.001
		IT4	12	-0.10	-0.19	-0.02	0.003

		NOR13	12	-0.14	-0.28	0.00	0.047
		IT1	16	-0.09	-0.17	-0.01	0.011
Mid-latitude	D-Mid-latitude	IT1	8	0.08	0.00	0.16	0.047
		IT1	12	0.08	0.00	0.16	0.048
		NOR13	12	0.22	0.09	0.36	0.001
		NOR2	20	-0.13	-0.23	-0.02	0.006
		IT4	24	-0.11	-0.20	-0.02	0.005
D-Arctic	D-Mid-latitude	IT4	12	0.15	0.05	0.24	0.001

Supplementary Table 3. Significant differences within accessions within each treatment.

LHY							
Treatment	Accession_1	Accession_2	ZT	meandiff	lower	upper	p-adj
Arctic	IT1	IT4	0	-4.99	-6.97	-3.02	0.001
	IT1	NOR13	0	-4.75	-6.94	-2.56	0.001
	IT1	NOR2	0	-3.15	-5.22	-1.09	0.001
	IT1	IT4	4	-7.30	-9.37	-5.24	0.001
	IT1	NOR13	4	-6.85	-8.83	-4.88	0.001
	IT1	NOR2	4	-4.02	-6.00	-2.05	0.001
	NOR2	IT4	4	3.28	1.30	5.26	0.001
	NOR2	NOR13	4	2.83	0.94	4.71	0.001
	IT1	IT4	8	-3.02	-5.00	-1.05	0.001
	IT1	NOR13	8	-2.84	-4.73	-0.96	0.001
	NOR2	IT4	8	2.16	0.19	4.14	0.016
	NOR2	NOR13	8	1.98	0.10	3.86	0.027
	IT1	IT4	24	-3.09	-5.75	-0.42	0.007
	IT1	NOR13	24	-3.03	-5.69	-0.37	0.009
Mid-latitude	IT1	IT4	0	-11.75	-15.50	-7.99	0.001
	IT1	NOR13	0	-10.67	-14.63	-6.71	0.001
	IT1	NOR2	0	-7.73	-11.34	-4.11	0.001
	NOR2	IT4	0	4.02	0.63	7.41	0.005
	IT1	IT4	24	-11.47	-16.05	-6.90	0.001
	IT1	NOR13	24	-11.03	-15.60	-6.45	0.001
	NOR2	IT4	24	7.19	2.62	11.77	0.001
	NOR2	NOR13	24	6.75	2.18	11.32	0.001
	IT1	IT4	4	-14.36	-17.90	-10.81	0.001
	IT1	NOR13	4	-14.21	-17.96	-10.45	0.001
	IT1	NOR2	4	-10.75	-14.14	-7.36	0.001
	NOR2	IT4	4	3.60	0.21	7.00	0.023

RVE8							
Treatment	Accession_1	Accession_2	ZT	meandiff	lower	upper	p-adj
Arctic	IT1	NOR2	4	-0.58	-1.12	-0.03	0.028
	NOR13	NOR2	4	-0.67	-1.20	-0.15	0.001
	NOR13	NOR2	8	-0.52	-1.05	0.00	0.048
Mid-latitude	NOR13	IT4	0	0.74	0.00	1.48	0.047
	NOR13	NOR2	0	-1.20	-1.91	-0.49	0.001
	NOR13	NOR2	4	-0.73	-1.44	-0.02	0.039
PRR9							
Treatment	Accession_1	Accession_2	ZT	meandiff	lower	upper	p-adj
Arctic	IT1	IT4	8	-0.59	-1.00	-0.19	0.001
Mid-latitude	IT1	IT4	8	-1.04	-1.70	-0.39	0.001
	IT1	NOR2	8	-0.89	-1.51	-0.26	0.001
PRR7							
Treatment	Accession_1	Accession_2	ZT	meandiff	lower	upper	p-adj
Arctic	NOR13	NOR2	20	-0.49	-0.95	-0.03	0.021
PRR5							
Treatment	Accession_1	Accession_2	ZT	meandiff	lower	upper	p-adj
Arctic	IT4	IT1	12	1.75	0.28	3.23	0.004
	IT4	NOR2	12	-2.15	-3.78	-0.52	0.001
	NOR13	IT1	12	2.66	1.26	4.07	0.001
	NOR13	NOR2	12	-3.06	-4.63	-1.49	0.001
	NOR13	IT1	16	2.03	0.56	3.50	0.001
	NOR13	NOR2	16	-2.18	-3.81	-0.55	0.001
Mid-latitude	IT4	IT1	8	1.99	1.07	2.91	0.001
	IT4	NOR2	8	-2.71	-3.63	-1.79	0.001
	NOR13	IT1	8	2.55	1.57	3.53	0.001
	NOR13	NOR2	8	-3.27	-4.25	-2.29	0.001
	IT4	IT1	12	2.86	1.90	3.82	0.001
	IT4	NOR2	12	-3.04	-4.00	-2.07	0.001
	NOR13	IT1	12	2.66	1.74	3.58	0.001
	NOR13	NOR2	12	-2.83	-3.75	-1.91	0.001
TOC1							
Treatment	Accession_1	Accession_2	ZT	meandiff	lower	upper	p-adj
Arctic	NOR13	IT1	0	0.32	0.06	0.57	0.002
	NOR13	NOR2	0	-0.34	-0.60	-0.08	0.001
	NOR13	IT1	20	0.50	0.27	0.73	0.001
	NOR13	IT4	20	0.36	0.14	0.58	0.001
	NOR13	NOR2	20	-0.48	-0.70	-0.26	0.001
LUX							
Treatment	Accession_1	Accession_2	ZT	meandiff	lower	upper	p-adj

Arctic	NOR13	IT1	20	0.14	0.03	0.25	0.001
	NOR13	IT4	20	0.11	0.01	0.22	0.026
	NOR13	NOR2	20	-0.13	-0.23	-0.02	0.004
Mid-latitude	IT4	IT1	12	0.08	0.00	0.16	0.025
	NOR13	IT1	12	0.13	0.06	0.21	0.001
	NOR13	NOR2	12	-0.12	-0.20	-0.04	0.001

Supplementary Table 4. Significant differences in phytohormone data between accessions within treatments.

ABA						
Treatment	Accession_1	Accession_2	meandiff	lower	upper	p-adj
Arctic	IT1	IT4	-602.97	-655.14	-550.81	<0.001
	IT1	NOR13	-600.63	-652.80	-548.46	<0.001
	IT1	NOR2	-521.86	-575.11	-468.61	<0.001
	IT4	NOR2	81.12	27.87	134.36	<0.001
	NOR13	NOR2	78.77	25.52	132.02	<0.001
Mid-latitude	IT1	IT4	-740.37	-792.54	-688.20	<0.001
	IT1	NOR13	-744.24	-796.40	-692.07	<0.001
	IT1	NOR2	-650.68	-706.11	-595.25	<0.001
	IT4	NOR2	89.69	34.26	145.12	<0.001
	NOR13	NOR2	93.55	38.12	148.99	<0.001
D-Arctic	IT1	IT4	-733.11	-809.90	-656.32	<0.001
	IT1	NOR13	-747.22	-824.02	-670.43	<0.001
	IT1	NOR2	-669.93	-753.78	-586.08	<0.001
D-Mid-latitude	IT1	IT4	-905.31	-982.10	-828.52	<0.001
	IT1	NOR13	-960.13	-1036.92	-883.34	<0.001
	IT1	NOR2	-869.47	-946.26	-792.68	<0.001
	NOR13	NOR2	90.66	13.86	167.45	0.006
IAA						
Treatment	Accession_1	Accession_2	meandiff	lower	upper	p-adj
Arctic	IT1	IT4	-18.33	-32.98	-3.68	0.002
	IT1	NOR13	-19.25	-33.91	-4.60	0.001
	IT1	NOR2	-77.63	-92.59	-62.68	<0.001
	IT4	NOR2	-59.30	-74.26	-44.35	<0.001
	NOR13	NOR2	-58.38	-73.33	-43.42	<0.001
Mid-latitude	IT1	IT4	-15.66	-30.32	-1.01	0.023
	IT1	NOR13	-18.80	-33.46	-4.15	0.001

	IT1	NOR2	-69.69	-85.26	-54.13	<0.001
	IT4	NOR2	-54.03	-69.60	-38.46	<0.001
	NOR13	NOR2	-50.89	-66.46	-35.32	<0.001
D-Arctic	IT1	NOR2	-98.54	-125.05	-72.04	<0.001
	IT4	NOR2	-83.95	-108.47	-59.44	<0.001
	NOR13	NOR2	-99.46	-123.30	-75.62	<0.001
D-Mid-latitude	IT1	NOR2	-102.92	-126.60	-79.24	<0.001
	IT4	NOR2	-90.74	-113.62	-67.87	<0.001
	NOR13	NOR2	-93.46	-115.69	-71.23	<0.001
JA-Ile						
Treatment	Accession_1	Accession_2	meandiff	lower	upper	p-adj
D-Arctic	IT1	IT4	38.59	16.69	60.49	<0.001
	IT4	NOR13	-23.06	-45.86	-0.27	0.044
OH-JA						
Treatment	Accession_1	Accession_2	meandiff	lower	upper	p-adj
Arctic	IT1	IT4	-908.11	-1580.91	-235.32	0.001
	IT1	NOR2	2232.83	1491.73	2973.92	<0.001
	IT4	NOR2	3140.94	2412.16	3869.71	<0.001
	NOR13	NOR2	2792.38	2063.60	3521.15	<0.001
Mid-latitude	IT1	IT4	-1011.58	-1670.79	-352.38	<0.001
	IT1	NOR13	-1039.16	-1698.36	-379.96	<0.001
	IT1	NOR2	1588.12	867.08	2309.17	<0.001
	IT4	NOR2	2599.71	1878.66	3320.75	<0.001
	NOR13	NOR2	2627.28	1906.24	3348.33	<0.001
D-Arctic	IT4	NOR2	1705.02	332.78	3077.26	0.002
D-Mid-latitude	IT1	NOR2	1761.33	679.59	2843.08	<0.001
	IT4	NOR2	2288.82	1251.51	3326.14	<0.001
	NOR13	NOR2	2394.27	1356.95	3431.58	<0.001
SA						
Treatment	Accession_1	Accession_2	meandiff	lower	upper	p-adj
Arctic	IT1	IT4	12280.77	9266.34	15295.21	<0.001
	IT1	NOR13	6038.85	3024.41	9053.29	<0.001
	IT4	NOR13	-6241.92	-9236.72	-3247.12	<0.001
	IT4	NOR2	-9358.20	-12437.40	-6279.03	<0.001
	NOR13	NOR2	-3116.28	-6195.46	-37.11	0.044
Mid-latitude	IT1	IT4	13589.55	10594.75	16584.34	<0.001
	IT1	NOR13	5621.63	2626.83	8616.43	<0.001
	IT1	NOR2	5289.39	2107.23	8471.54	<0.001

	IT4	NOR13	-7967.91	-10962.70	-4973.11	<0.001
	IT4	NOR2	-8300.16	-11482.30	-5118.01	<0.001
D-Arctic	IT1	IT4	16355.03	11731.64	20978.41	<0.001
	IT1	NOR13	9186.58	4563.20	13809.97	<0.001
	IT4	NOR13	-7168.44	-11576.70	-2760.22	<0.001
	IT4	NOR2	-11794.70	-16608.20	-6981.22	<0.001
D-Mid-latitude	IT1	IT4	14144.82	9600.93	18688.72	<0.001
	IT1	NOR13	5869.84	1325.95	10413.74	0.001
	IT4	NOR13	-8274.98	-12683.20	-3866.75	<0.001
	IT4	NOR2	-10431.60	-14839.80	-6023.37	<0.001

Supplementary Table 5. Details of analysis of phytohormones by LC-MS/MS [HPLC 1260 (Agilent Technologies)-QTRAP6500 (SCIEX)] in negative ionisation mode.

Q1	Q3	RT (min)	Compound	Internal std	RF	DP	EP	CE	CXP
136.93	93	3.3	SA	D4-SA	1.0	-20	-8	-24	-7
263	153.2	3.4	ABA	D6-ABA	1.0	-20	-12	-22	-2
209.07	59	3.6	JA	D6-JA+D5-JA	1.0	-20	-9	-24	-2
322.19	130.1	3.9	JA-Ile	D6-JA-Ile+D5-JA-Ile	1.0	-50	-4.5	-30	-4
290.9	165.1	4.6	OPDA	D6-JA+D5-JA	1.0	-20	-12	-24	-2
140.93	97	3.3	D4-SA			-20	-8	-24	-7
269	159.2	3.4	D6-ABA			-20	-12	-22	-2
215	59	3.6	D6-JA			-20	-9	-24	-2
214	59	3.6	D5-JA			-20	-9	-24	-2
328.19	130.1	3.9	D6-JA-Ile			-50	-4.5	-30	-4
327.19	130.1	3.9	D5-JA-Ile			-50	-4.5	-30	-4

Supplementary Figure 1. Average phytohormone levels within each treatment over a 24 h period.

