Table S1. List of the satellite images used during the 2016-17 growing season.

Acquisition Date	ID	Sun Zenith Angle Mean	Sun Azimuth Angle Mean
09 October 2016	S1	36.45	46.67
19 October 2016	S2	33.20	49.96
29 October 2016	S3	30.41	53.91
08 November 2016	S4	28.24	58.45
28 November 2016	S5	26.08	67.88
18 December 2016	S6	26.71	74.19
28 December 2016	S7	27.76	75.17
17 January 2017	S8	30.74	72.77
27 January 2017	S9	32.53	69.79
16 February 2017	S10	36.58	61.66
26 February 2017	S11	38.86	57.06
08 March 2017	S12	41.32	52.42
18 March 2017	S12	43.92	47.94
28 March 2017	S14	46.63	43.78

Table S2. List of the satellite images used during the 2017-18 growing season.

Acquisition Date	ID	Sun Zenith Angle Mean	Sun Azimuth Angle Mean
24 September 2017	S15	41.93	42.76
29 September 2017	S16	40.11	43.98
04 October 2017	S17	38.28	45.18
14 October 2017	S18	34.84	48.14
29 October 2017	S19	30.50	53.87
08 November 2017	S20	28.31	58.40
13 November 2017	S21	27.45	60.74
28 November 2017	S22	26.13	67.83
08 December 2017	S23	26.12	71.64
13 December 2017	S24	26.32	76.06
23 December 2017	S25	27.16	74.85
17 January 2018	S26	30.70	72.83
06 February 2018	S27	34.43	66.10
26 February 2018	S28	38.81	57.18
03 March 2018	S29	40.00	54.83
08 March 2018	S30	41.26	52.54
13 March 2018	S31	42.52	50.24

Table S3. Pearson correlation coefficients (R and, in brackets, *P*) between spectral data and weather parameters in the medium-vigor area over 2016-2017 growing season. NR = not recurring correlation; red font = high significance ($P < 0.05$); blue fill = correlation (R > ±0.4) recurring in high-vigor, medium-vigor and whole areas.

.	Band 3 Green	Band 4 Red	Band 5 Vegetation Red Edge	Band 6 Vegetation Red Edge	Band 7 Vegetation Red Edge	NIR	CARI	CARI 2	EVI	SAVI	TCARI
avg T_{-12}	-0.70 (0.186)	-0.74 (0.153)	**<0.90 (0.036)**	-0.67 (0.215)	-0.59 (0.290)	-0.46 (0.431)	**-0.99 (0.001)**	NR	<±0.4	NR	**-0.89 (0.041)**
MAX T_{-12}	-0.83 (0.084)	-0.88 (0.051)	**-0.97 (0.007)**	-0.67 (0.214)	-0.59 (0.290)	-0.45 (0.445)	**-0.97 (0.006)**	NR	<±0.4	NR	**-0.95 (0.011)**

GDD$_{-12}$	-0.70 (0.186)	-0.74 (0.153)	**-0.90 (0.036)**	-0.67 (0.215)	-0.59 (0.290)	-0.46 (0.431)	**-0.99 (0.001)**	NR	<±0.4	NR	**-0.89 (0.041)**
avg ST$_{-12}$	-0.68 (0.203)	NR	-0.81 (0.095)	-0.67 (0.212)	-0.62 (0.266)	-0.41 (0.493)	**-0.89 (0.043)**	NR	-0.49 (0.400)	NR	**-0.87 (0.050)**
MAX ST$_{-12}$	**-0.89 (0.044)**	NR	**-0.93 (0.023)**	-0.50 (0.394)	-0.41 (0.494)	<±0.4	**-0.89 (0.041)**	NR	-0.47 (0.425)	NR	**-0.94 (0.016)**
Δ 35°C$_{-12}$	-0.60 (0.289)	-0.72 (0.167)	**-0.89 (0.044)**	**-0.97 (0.005)**	**-0.94 (0.014)**	-0.84 (0.073)	-0.87 (0.053)	NR	<±0.4	NR	**-0.82 (0.091)**
avg RH$_{-12}$	NR	-0.60 (0.278)	-0.76 (0.132)	NR	NR	NR	-0.72 (0.168)	-0.82 (0.091)	NR	+0.87 (0.057)	NR

Table S4. Pearson correlation coefficients (R and, in brackets, *P*) between spectral data and weather parameters in the medium-vigor area over 2017-2018 growing season. NR = not recurring correlation; red font = high significance ($P < 0.05$); blue fill = correlation (R > ±0.4) recurring in high-vigor, medium-vigor and whole areas.

	Band 3 Green	Band 4 Red	Band 5 Vegetation Red Edge	Band 6 Vegetation Red Edge	Band 7 Vegetation Red Edge	NIR	CARI	CARI 2	EVI	SAVI	TCARI
avg T$_{-12}$	-0.73 (0.096)	<±0.4	<±0.4	-0.66 (0.154)	-0.62 (0.181)	-0.64 (0.174)	-0.63 (0.181)	NR	-0.64 (0.169)	NR	-0.79 (0.061)
MAX T$_{-12}$	-0.77 (0.071)	<±0.4	<±0.4	-0.73 (0.100)	-0.70 (0.124)	-0.71 (0.110)	-0.66 (0.152)	NR	-0.74 (0.095)	NR	**-0.85 (0.032)**
GDD$_{-12}$	-0.73 (0.096)	<±0.4	<±0.4	-0.66 (0.154)	-0.62 (0.181)	-0.64 (0.174)	-0.63 (0.181)	NR	-0.64 (0.169)	NR	-0.79 (0.061)
avg ST$_{-12}$	-0.76 (0.077)	NR	<±0.4	**-0.91 (0.012)**	**-0.90 (0.014)**	**-0.91 (0.012)**	-0.75 (0.082)	NR	-0.78 (0.065)	NR	**-0.91 (0.011)**
MAX ST$_{-12}$	-0.63 (0.077)	NR	<±0.4	-0.72 (0.109)	-0.69 (0.125)	-0.70 (0.124)	-0.63 (0.179)	NR	-0.58 (0.229)	NR	-0.79 (0.061)
Δ 35°C$_{-12}$	-0.73 (0.102)	<±0.4	-0.42 (0.402)	**-0.90 (0.014)**	**-0.89 (0.016)**	**-0.91 (0.012)**	-0.77 (0.070)	NR	-0.62 (0.191)	NR	-0.79 (0.063)
avg RH$_{-12}$	NR	-0.53 (0.283)	-0.48 (0.338)	NR	NR	NR	<±0.4	-0.53 (0.276)	NR	+0.51 (0.303)	NR

Table S5. Pearson correlation coefficients (R and, in brackets, *P*) between spectral data and weather parameters in the medium-vigor area over the two growing seasons considered jointly. NR = not recurring correlation; red font = high significance ($P < 0.05$); blue fill = correlation (R > ±0.4) recurring in high-vigor, medium-vigor and whole areas.

	Band 3 Green	Band 4 Red	Band 5 Vegetation Red Edge	Band 6 Vegetation Red Edge	Band 7 Vegetation Red Edge	NIR	CARI	CARI 2	EVI	SAVI	TCARI
avg T$_{-12}$	**-0.74 (0.009)**	-0.43 (0.188)	<0.57 (0.066)	-0.55 (0.079)	-0.50 (0.113)	-0.50 (0.119)	**-0.62 (0.043)**	NR	-0.56 (0.073)	NR	**-0.71 (0.014)**
MAX T$_{-12}$	**-0.80 (0.003)**	-0.48 (0.133)	**-0.60 (0.049)**	<0.57 (0.066)	-0.53 (0.094)	-0.52 (0.101)	**-0.62 (0.044)**	NR	-0.62 (0.041)	NR	**-0.74 (0.009)**

GDD$_{-12}$	**-0.74 (0.009)**	-0.43 (0.188)	<0.57 (0.066)	-0.55 (0.079)	-0.50 (0.113)	-0.50 (0.119)	**-0.62 (0.044)**	NR	-0.56 (0.073)	NR	**-0.71 (0.014)**
avg ST$_{-12}$	**-0.74 (0.009)**	NR	-0.43 (0.187)	**-0.79 (0.003)**	**-0.77 (0.005)**	**-0.71 (0.013)**	**-0.70 (0.015)**	NR	**-0.73 (0.010)**	NR	**-0.85 (0.001)**
MAX ST$_{-12}$	**-0.65 (0.031)**	NR	-0.43 (0.187)	**-0.66 (0.025)**	**-0.63 (0.038)**	-0.55 (0.077)	**-0.73 (0.011)**	NR	-0.52 (0.103)	NR	**-0.83 (0.001)**
Δ 35°C$_{-12}$	**-0.70 (0.015)**	<±0.4	**-0.60 (0.049)**	**-0.81 (0.002)**	**-0.80 (0.002)**	**-0.81 (0.002)**	**-0.70 (0.016)**	NR	-0.053 (0.096)	NR	**-0.71 (0.014)**
avg RH$_{-12}$	NR	**-0.63 (0.039)**	**-0.63 (0.037)**	NR	NR	NR	<±0.4	**-0.62 (0.004)**	NR	**+0.66 (0.028)**	NR

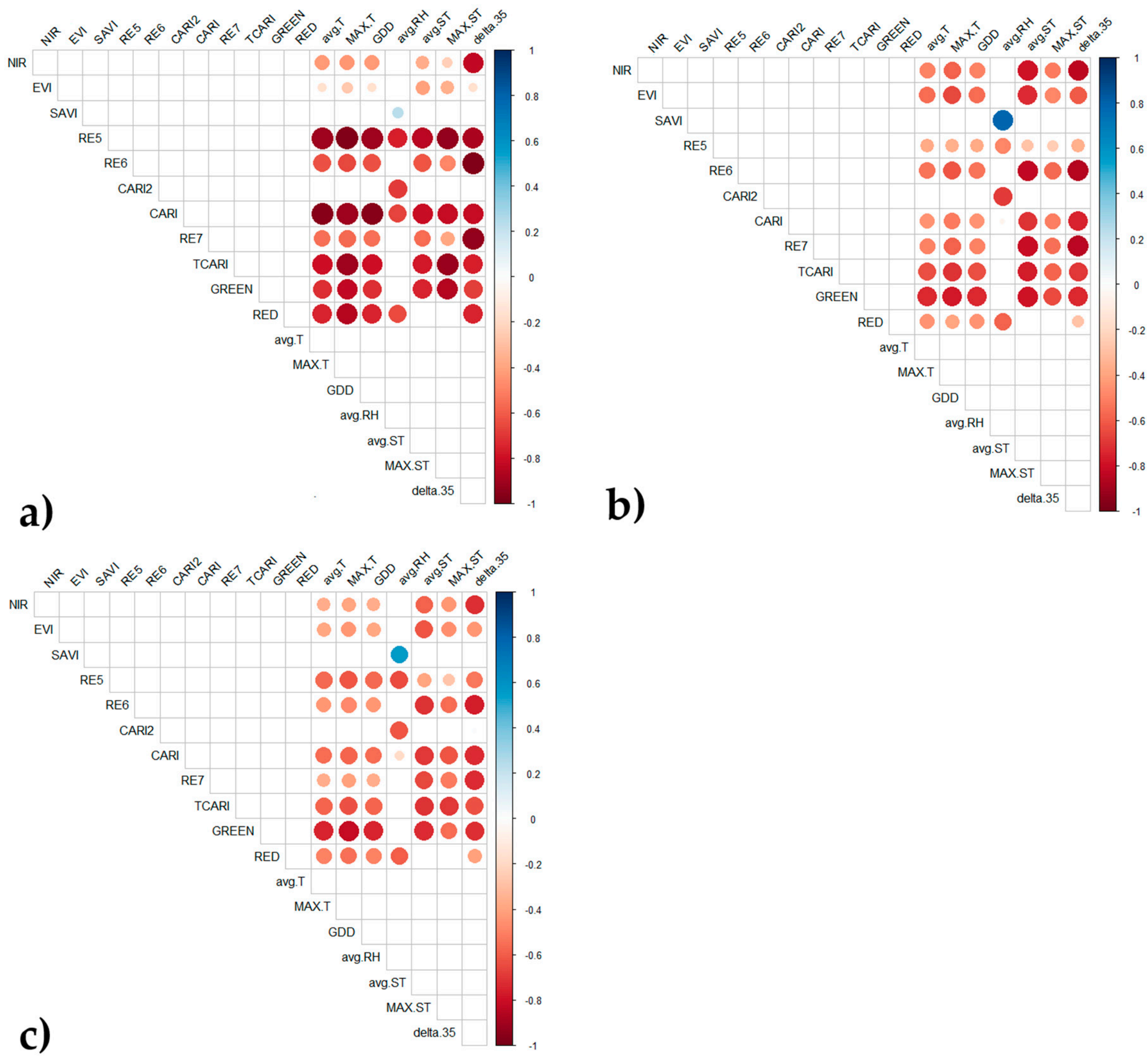

Figure S1. Correlogram of the input variables for high-vigor area in 2016/17 growing season (a), 2017/2018 growing season (b) and combined for both seasons (c). Only recurrent correlations between spectral features and weather conditions are shown. Positive correlations are displayed in blue and negative correlations in red colour. Colour intensity is proportional to R, while the magnitude of the circles is proportional to *P*.

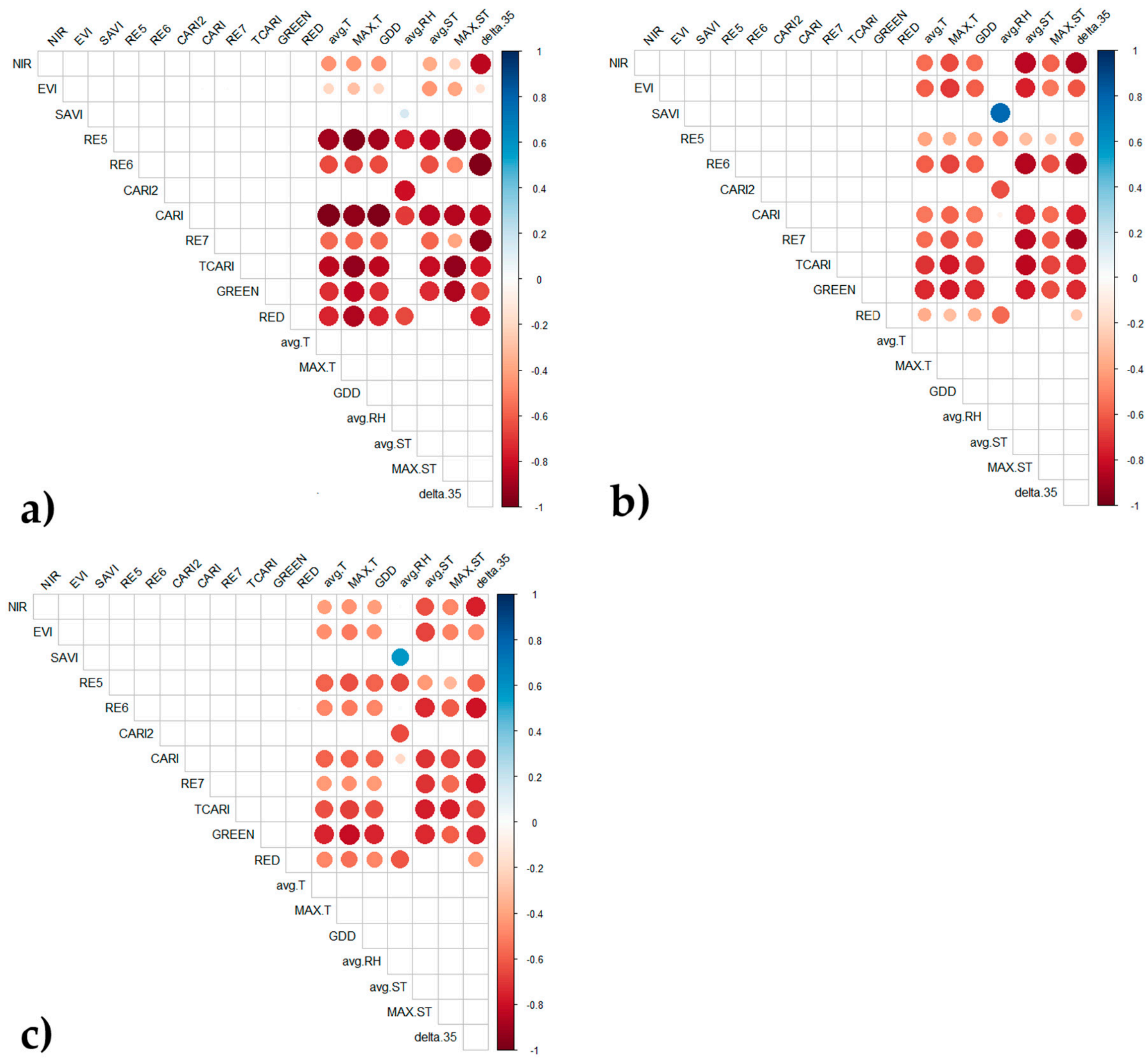

Figure S2. Correlogram of the input variables for the whole area in 2016/17 growing season (a), 2017/2018 growing season (b) and combined for both seasons (c). Only recurrent correlations between spectral features and weather conditions are shown. Positive correlations are displayed in blue and negative correlations in red colour. Colour intensity is proportional to R, while the magnitude of the circles is proportional to *P*.