

## *Supplementary Material*

### 1 UAV flights

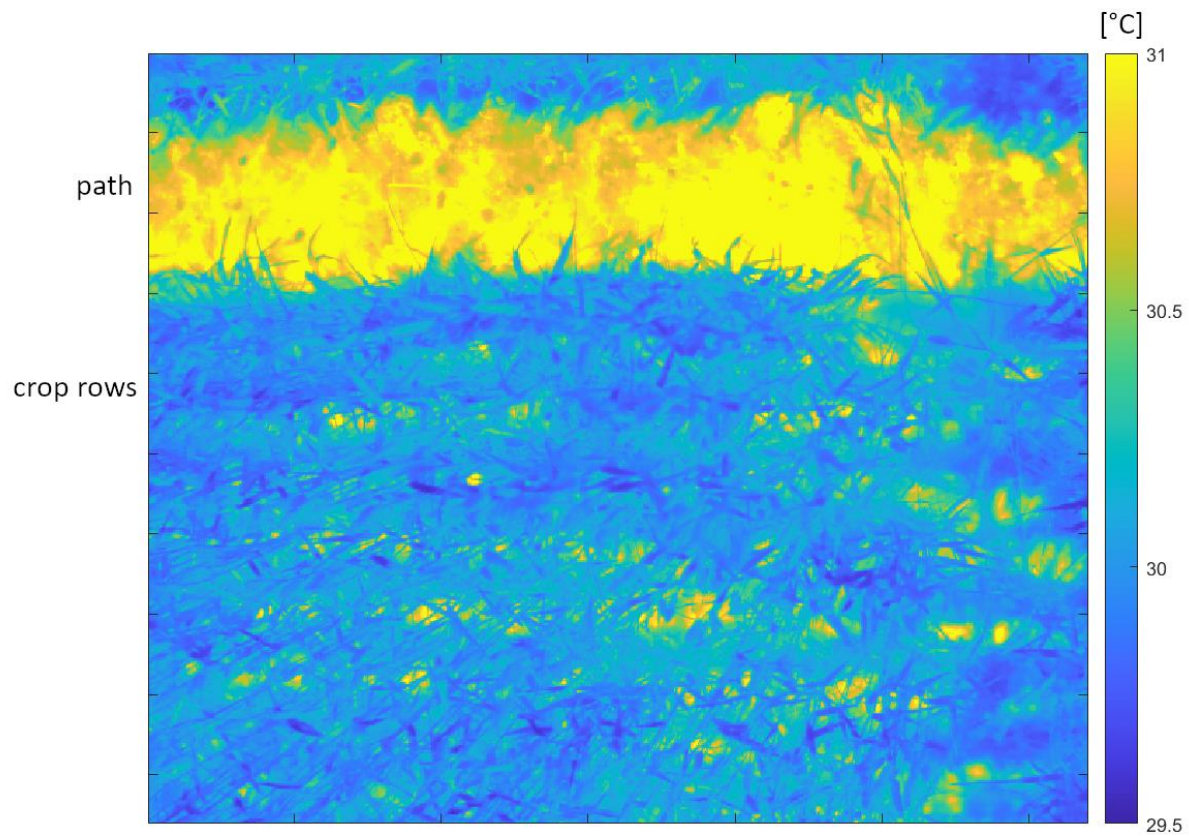
**Table 1: Flight dates of UAV measurements. The BBCH stages (Lancashire et al., 1991) give the approximate growth stage of winter wheat during the UAV flights.**

Date	Time	Average BBCH Stage	Date	Time	Average BBCH Stage
2018-06-04	13:47	73	2018-06-20	11:05	81
2018-06-07	15:20	75	2018-06-20	12:27	81
2018-06-07	15:48	75	2018-06-20	14:00	81
2018-06-16	11:19	78	2018-06-20	15:05	81
2018-06-16	11:46	78	2018-06-20	15:49	81
2018-06-16	12:50	78	2018-06-23	15:09	82
2018-06-16	13:15	78	2018-06-26	10:35	83
2018-06-16	14:06	78	2018-06-26	13:49	83
2018-06-16	14:32	78	2018-06-30	11:01	85
2018-06-16	15:27	78	2018-07-04	13:35	87
2018-06-20	09:24	81	2018-07-09	13:15	92
2018-06-20	10:11	81	2018-07-12	14:30	92+

## 2 Orthomosaic accuracies

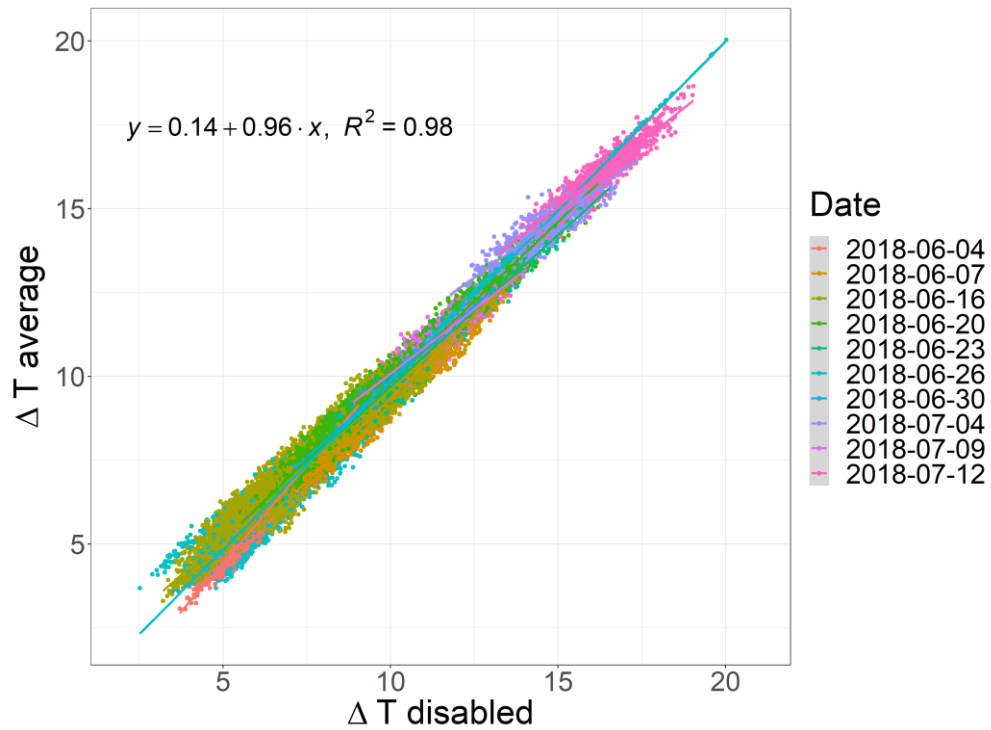
**Table 2: Accuracy parameters of the UAV orthomosaics generated through the processing pipeline as described in the section 2.4 of the main manuscript.**

Date	Time	Altitude (m)	Resolution (cm/px)	Total Error (cm)	Total Error (px)
2018-06-04	13:47	75.10	5.07	8.56	0.92
2018-06-07	15:20	88.90	5.05	7.69	0.11
2018-06-07	15:48	74.60	5.04	5.68	0.08
2018-06-16	11:19	75.70	5.10	4.18	0.08
2018-06-16	11:46	94.00	5.11	5.89	0.10
2018-06-16	12:50	90.00	4.90	3.69	0.11
2018-06-16	13:15	79.70	5.19	5.62	0.08
2018-06-16	14:06	104.00	5.68	9.34	0.08
2018-06-16	14:32	74.80	5.04	4.01	0.09
2018-06-16	15:27	75.40	5.08	2.39	0.12
2018-06-20	09:24	74.20	5.01	9.43	0.08
2018-06-20	10:11	73.20	4.93	7.00	0.08
2018-06-20	11:05	78.80	4.93	6.31	0.08
2018-06-20	12:28	97.70	4.91	4.65	0.09
2018-06-20	14:00	75.10	5.07	5.62	0.07
2018-06-20	15:05	106.00	5.94	8.45	0.08
2018-06-20	15:49	108.00	6.00	13.94	0.07
2018-06-23	15:09	87.30	4.89	6.23	0.13
2018-06-26	10:35	92.90	5.00	9.08	0.08
2018-06-26	13:49	112.00	6.08	15.41	0.07
2018-06-30	11:01	87.30	5.08	10.05	0.10
2018-07-04	13:35	89.30	5.11	7.67	0.13
2018-07-09	13:15	75.70	5.10	4.43	0.10
2018-07-12	14:30	75.60	5.05	3.86	0.12



**Appendix figure 1: High-resolution thermal image taken with the FIP phenotyping station (Kirchgessner et al. 2017) at nadir camera position taken at 11:39h on the 2018-06-20. The soil is considerably warmer than the canopy.**

### 3 Linear relationship between blending modes



**Appendix figure 2: Overall linear relationship (Intercept = 0.14, slope = 0.96,  $R^2 = 0.98$ ) between the canopy temperature values obtained with the blending modes 'average' and 'disabled' colored by date of UAV flight.**

**Table 3: Parameters of the linear relation between the two evaluated blending modes (‘average’ and ‘disabled’ for each UAV flight (timestamp)).**

<b>Timestamp</b>	<b>R2</b>	<b>Slope</b>	<b>Intercept</b>
04.06.2018 13:47	0.92	1.16	-1.37
07.06.2018 15:20	0.90	0.94	-0.12
07.06.2018 15:48	0.78	0.81	1.58
16.06.2018 11:19	0.84	0.74	1.37
16.06.2018 11:46	0.87	0.88	0.64
16.06.2018 12:50	0.81	0.82	1.60
16.06.2018 13:15	0.88	0.80	1.37
16.06.2018 14:06	0.92	0.95	0.07
16.06.2018 14:32	0.93	0.91	1.11
16.06.2018 15:27	0.90	0.84	1.14
20.06.2018 09:24	1.00	1.00	0.00
20.06.2018 10:11	0.92	0.87	0.78
20.06.2018 11:05	0.96	0.89	0.84
20.06.2018 12:27	0.96	0.87	1.27
20.06.2018 14:00	0.98	0.92	0.81
20.06.2018 15:05	0.98	0.90	0.94
20.06.2018 15:49	1.00	1.00	0.00
23.06.2018 15:09	0.97	0.91	0.62
26.06.2018 10:35	0.73	0.70	1.50
26.06.2018 13:49	1.00	1.00	0.00
30.06.2018 11:01	0.96	0.90	0.81
04.07.2018 13:35	0.82	0.72	3.90
09.07.2018 13:15	0.87	0.77	2.43
12.07.2018 14:30	0.87	0.78	3.28