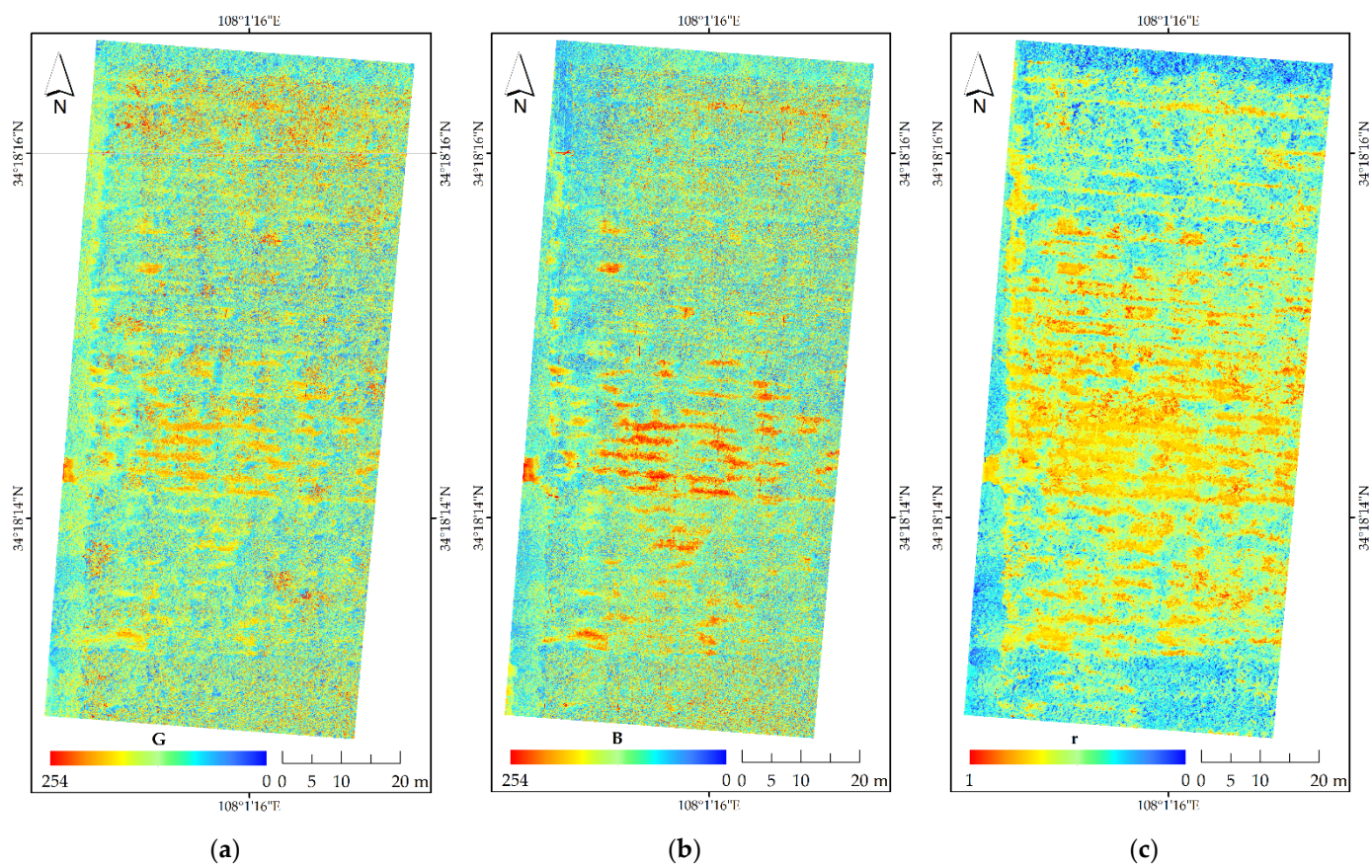
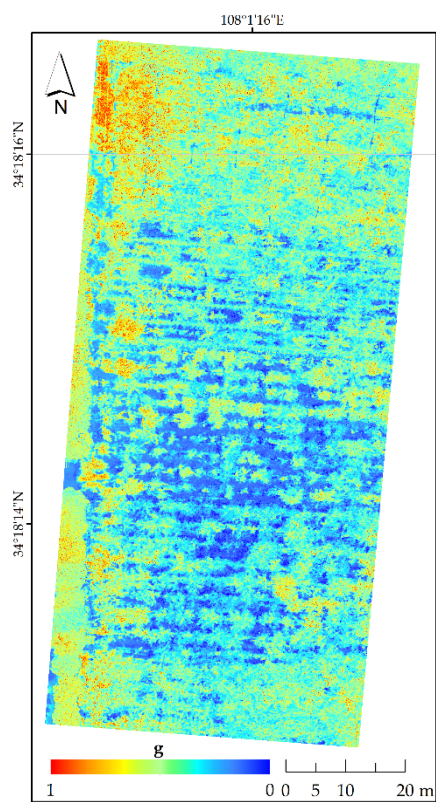


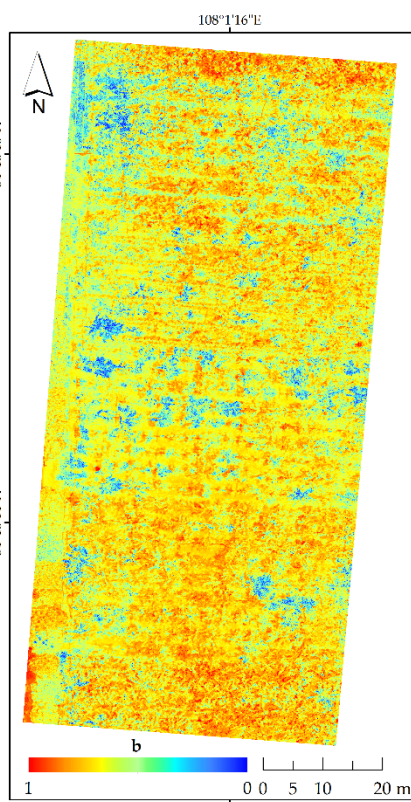
**Figure S1.** Images taken and processed by CI-110.



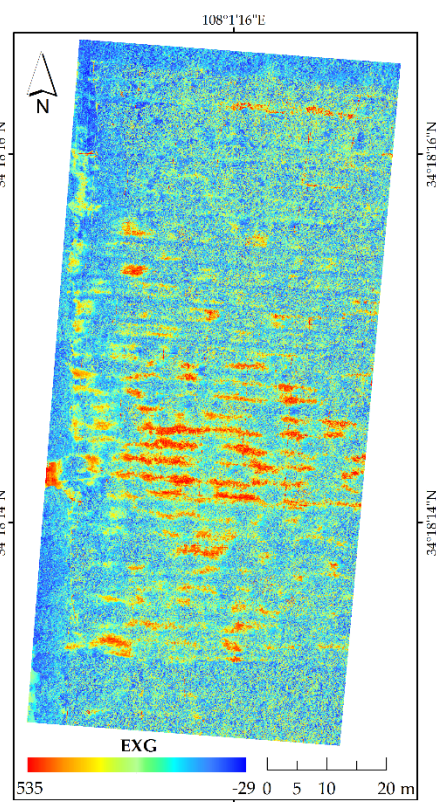




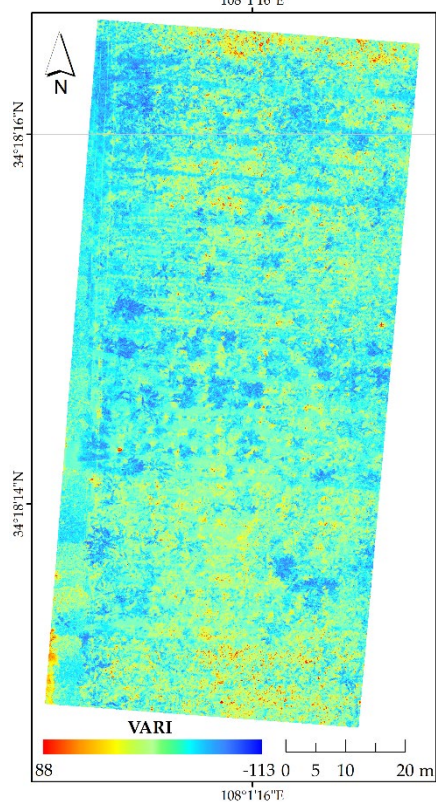
(d)



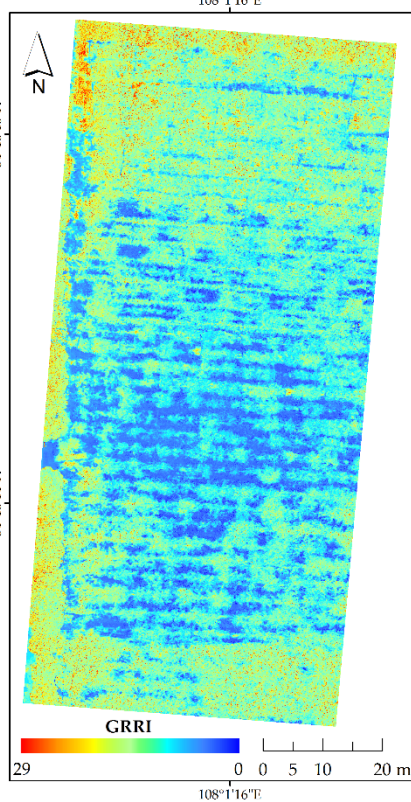
(e)



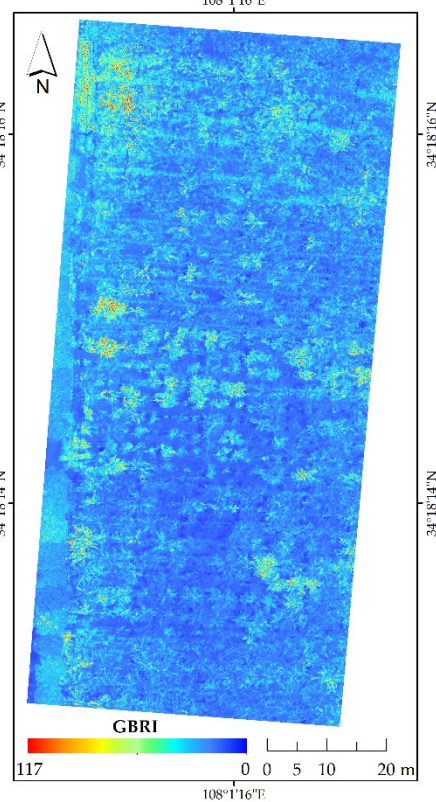
(f)



(g)

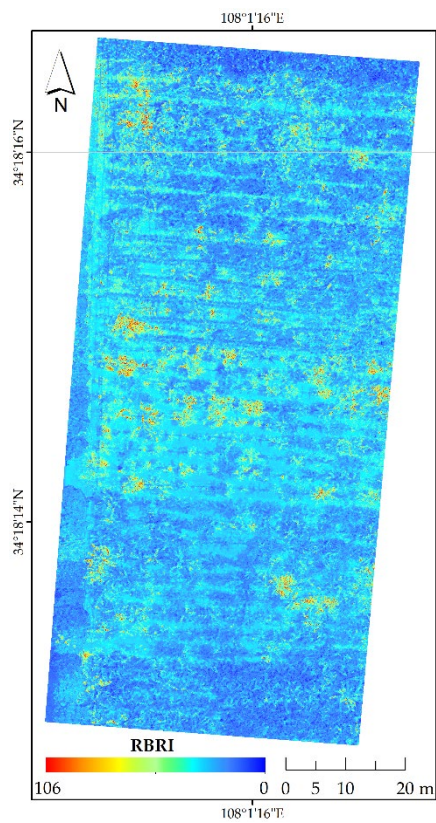


(h)

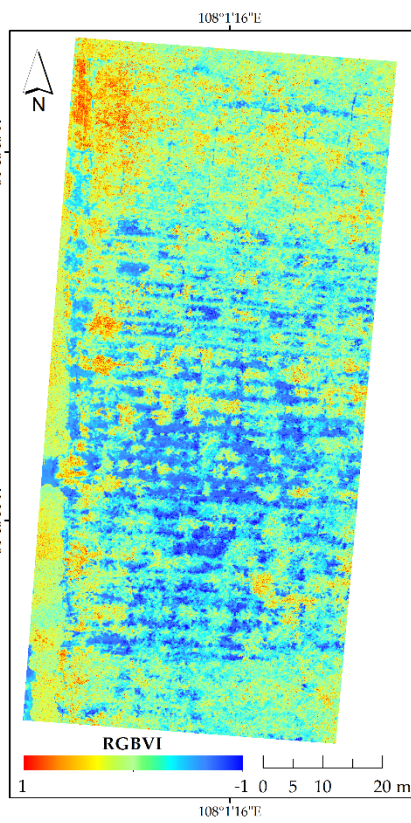


(i)

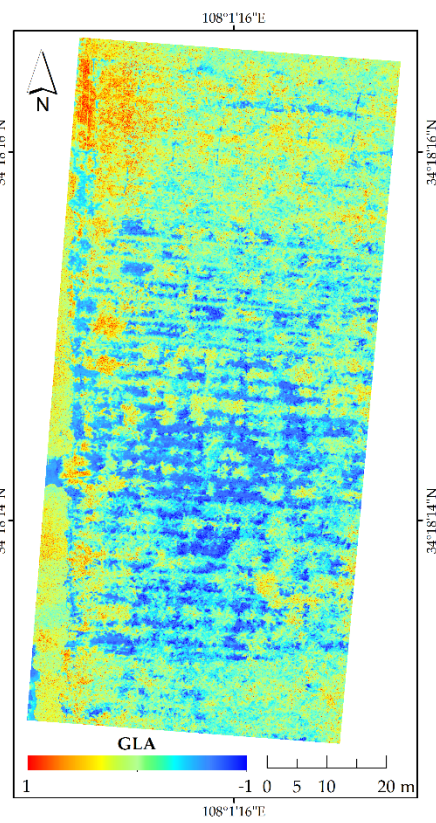




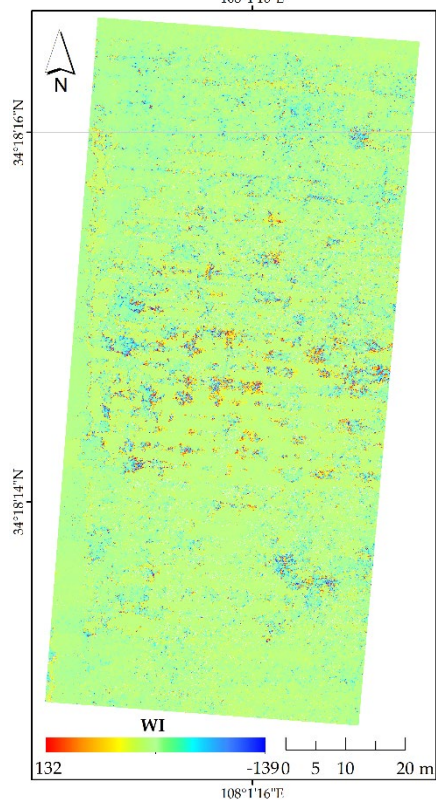
(j)



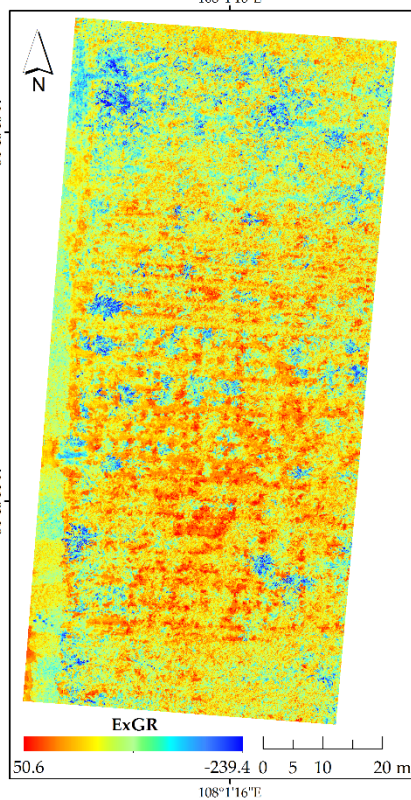
(k)



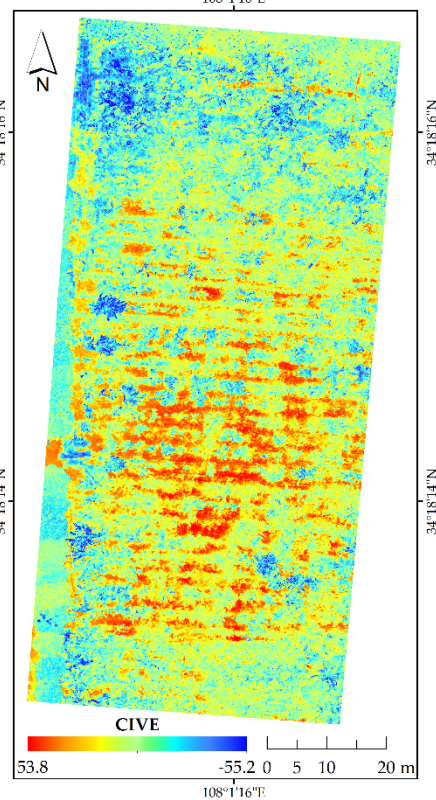
(l)



(m)

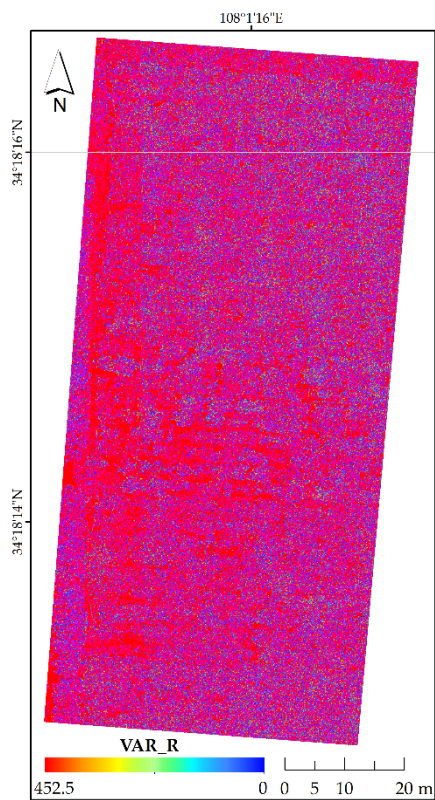


(n)

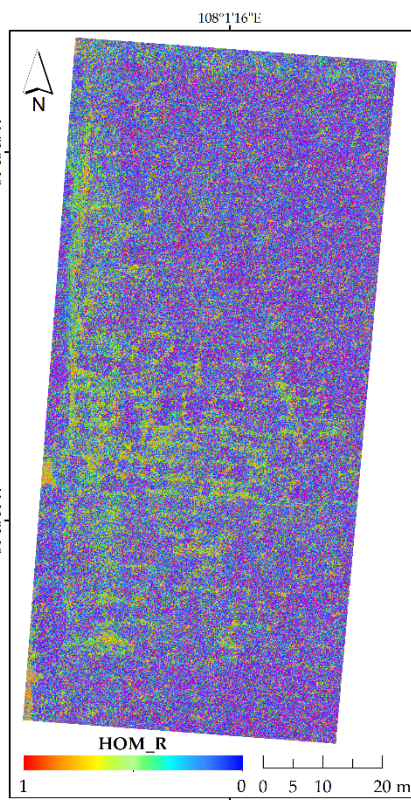


(o)

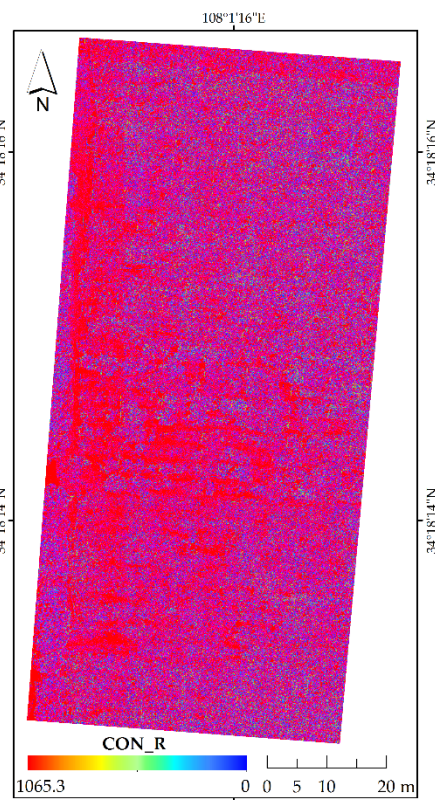




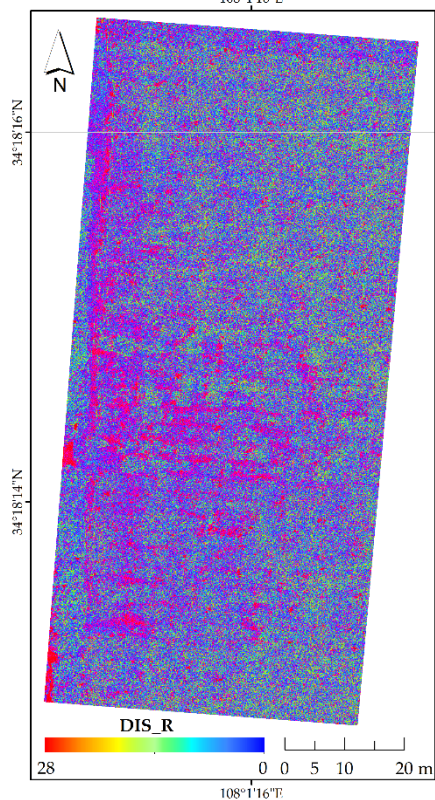
(p)



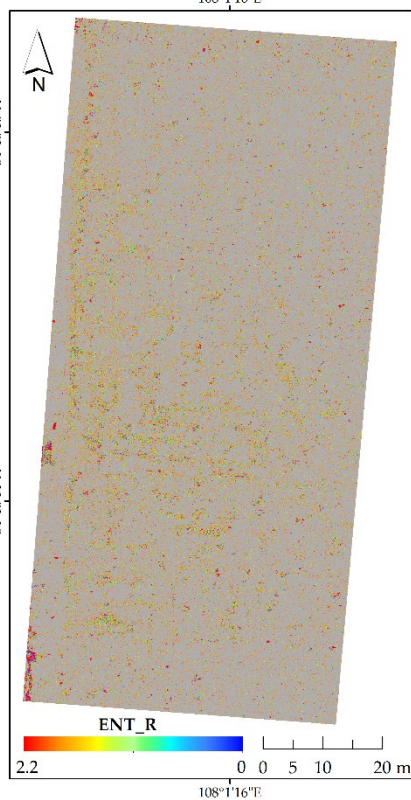
(q)



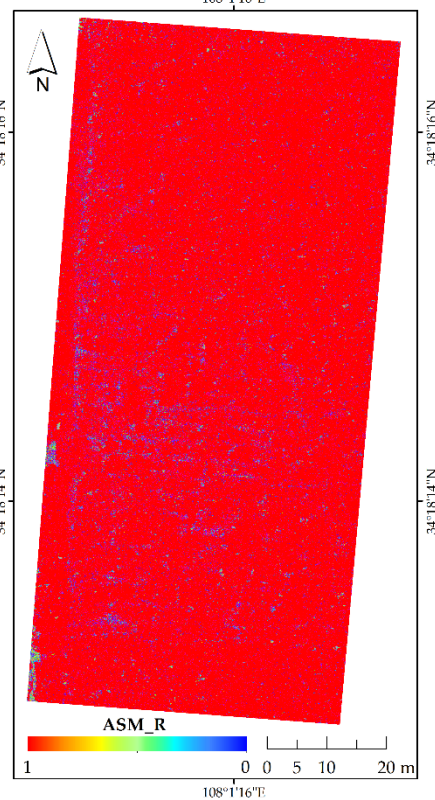
(r)



(s)

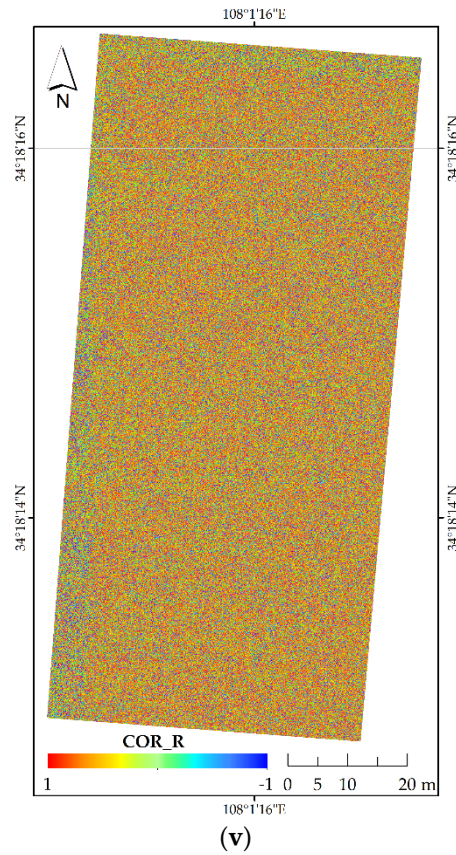


(t)



(u)





**Figure S2.** More images of parameters in the study. (a) G (DN value of Green Channel); (b) B (DN value of Blue Channel); (c). r (Normalized Redness Intensity); (d) g (Normalized Greenness Intensity); (e) b (Normalized Blueness Intensity); (f). EXG (Excess Green Index) ; (g) VARI (Visible Atmospherically Resistant Index); (h). GRRI (Green Red Ratio Index); (i) GBRI (Green Blue Ratio Index); (j) RBRI (Red Blue Ratio Index); (k). RGBVI (Red Green Blue Vegetation Index) ; (l) GLA (Green Leaf Algorithm); (m) WI (Woebbecke Index); (n) ExGR (Excess Green Red Index); (o). CIVE (Color Index of Vegetation) ; (p) VAR\_R (Variance of the red band); (q) HOM\_R (Homogeneity of the red band); (r). CON\_R (Contrast of the red band); (s) DIS\_R (Dissimilarity of the red band); (t). ENT\_R (Entropy of the red band); (u) ASM\_R (Angular Second Moment of the red band); (v). COR\_R (Correlation of the red band).

**Table S1.** Comparison of single-factor model for kiwifruit LAI in each growth stage.

Growth Stages	Independent Variable	Modeling Method	Modeling Equation	R <sup>2</sup>	RMSE	nRMSE/%
IF	R	linear	$y = -0.0141x + 1.6649$	0.450	0.082	16.10
		quadratic	$y = 0.0005x^2 - 0.1028x + 5.2873$	0.466	0.081	15.86
		polynomial				
		power	$y = 11596.9269x^{-2.2793}$	0.462	0.081	15.93
		exponential	$y = 4.8253e^{-0.028x}$	0.459	0.082	15.96
YF	ExGR	logarithmic	$y = -1.1559\ln(x) + 5.6033$	0.454	0.082	16.03
		linear	$y = 0.0062183x + 1.5306143$	0.715	0.061	14.31
		quadratic	$y = -0.00001784x^2 + 0.00006079x + 1.004$	0.719	0.061	14.22
		polynomial				
		power	-			
FE	ExGR	exponential	$y = 3.9041e^{0.0126x}$	0.677	0.065	15.26
		logarithmic	-			
		linear	$y = 0.0080156x + 2.0424765$	0.702	0.115	18.96
		quadratic	$y = 0.00006931x^2 + 0.03275x + 4.215$	0.736	0.108	17.84
		polynomial				
		power	-			



exponential	$y = 6.4786e^{0.0135x}$	0.735	0.108	17.87
logarithmic	-			

Notes: - : indicates that the model does not exist.

**Table S2.** Variable selection for SWR with only spectral indexes in each growth stage.

Growth Stages	Independent Variable	AIC	R <sup>2</sup>	RMSE	nRMSE/%
Initial flowering stage	R, G, B, b, EXG, GBRI, RBRI, RGBVI, ExGR, CIVE	-318.46	0.564	0.073	14.33%
	G, b, GBRI	-323.23	0.541	0.075	14.70%
	G, RBRI	-321.82	0.516	0.077	15.09%
Young fruit stage	R, G, B, r, g, b, EXG, VARI, GRRI, GBRI, RGBVI, GLA, MGRVI, ExGR, CIVE	-361.12	0.815	0.049	11.55%
	R, G, r, g, VARI, GRRI, GBRI, RGBVI, GLA, MGRVI	-363.11	0.815	0.049	11.55%
	R, G, r, g, VARI, GRRI, GBRI, RGBVI, GLA	-365.10	0.819	0.049	11.55%
Fruit enlargement stage	R, G, B, r, g, b, EXG, VARI, GRRI, GBRI, RGBVI, GLA, MGRVI, ExGR, CIVE	-273.16	0.781	0.098	16.23%
	R, G, g, GRRI, GBRI, MGRVI	-278.64	0.765	0.102	16.81%
	G, GRRI, GBRI	-278.86	0.743	0.106	17.59%

**Table S3.** Variable selection for SWR with combined texture feature in each growth stage.

Growth Stages	Independent Variable	AIC	R <sup>2</sup>	RMSE	nRMSE/%
IF	R, G, B, b, EXG, GBRI, RBRI, RGBVI, ExGR, CIVE, MEA_R, VAR_R, HOM_R, CON_R, DIS_R, MEA_G, VAR_G, HOM_G, CON_G, DIS_G, ASM_G, MEA_B, VAR_B, HOM_B, CON_B, DIS_B	-366.68	0.863	0.041	8.03%
	R, G, B, b, GBRI, RBRI, RGBVI, VAR_R, HOM_R, CON_R, DIS_R, MEA_G, VAR_G, ASM_G, VAR_B, HOM_B, CON_B, DIS_B	-368.88	0.859	0.042	8.14%
	G, B, b, GBRI, RBRI, RGBVI, VAR_R, HOM_R, CON_R, DIS_R, MEA_G, VAR_G, ASM_G, VAR_B, HOM_B, CON_B, DIS_B	-368.18	0.853	0.043	8.31%
YF	R, G, B, r, g, b, EXG, VARI, GRRI, GBRI, RGBVI, GLA, MGRVI, ExGR, CIVE, MEA_R, VAR_R, HOM_R, DIS_R, ENT_R, ASM_R, COR_R, MEA_G, VAR_G, HOM_G, DIS_G, ENT_G, COR_G, MEA_B, VAR_B, HOM_B, DIS_B, ENT_B, ASM_B, COR_B	-409.77	0.951	0.025	5.96%
	R, G, B, g, VARI, GRRI, GBRI, RGBVI, GLA, MGRVI, MEA_R, VAR_R, DIS_R, ENT_R, ASM_R, COR_R, VAR_G, HOM_G, DIS_G, ENT_G, COR_G, MEA_B, VAR_B, HOM_B, DIS_B, ENT_B, ASM_B	-465.04	0.978	0.017	3.99%



FE	R, G, B, g, VARI, GRRI, GBRI, RGBVI, GLA, MGRVI, MEA_R, VAR_R, DIS_R, ENT_R, ASM_R, COR_R, VAR_G, COR_G, MEA_B, VAR_B, HOM_B, DIS_B, ENT_B, ASM_B	-445.41	0.967	0.021	4.88%
	R, G, B, r, g, b, EXG, VARI, GRRI, GBRI, RGBVI, GLA, MGRVI, ExGR, CIVE, MEA_R, VAR_R, HOM_R, DIS_R, ENT_R, ASM_R, COR_R, MEA_G, VAR_G, HOM_G, DIS_G, ENT_G, COR_G, MEA_B, VAR_B, HOM_B, DIS_B, ENT_B, ASM_B, COR_B	-334.12	0.955	0.045	7.37%
	R, B, r, g, VARI, GRRI, GBRI, RGBVI, GLA, MGRVI, VAR_R+ ENT_R, COR_R, MEA_G, HOM_G, ENT_G, COR_G, MEA_B, HOM_B, ENT_B, ASM_B	-343.92	0.947	0.048	7.99%
	R, B, r, g, VARI, GRRI, GBRI, RGBVI, GLA, MGRVI, VAR_R, ENT_R, COR_R, MEA_G, COR_G, MEA_B, HOM_B, ENT_B, ASM_B	-344.54	0.944	0.050	8.20%