Supplementary materials

Table S1. Classification and mis-classification matrices for BCN tolerance type of cultivar using ground measurements and UAV hyperspectral data 102 and 152 das. (1) Ground - 102 das, (2) Ground - 152 das, (3) UAV - 102 das, (4) UAV - 152 das

1	Ground 102 das	Predicted classification	
		Susc.	Tolerant
Actual classification	Susceptible	23	11
	Tolerant	11	39
Indices selected	NDVI, WI_NDVI, ARI, PRI		

2	Ground 152 das	Predicted classification	
		Susc.	Tolerant
Actual classification	Susceptible	31	9
	Tolerant	12	44
Indices selected	780/700, LCI, SIPI, NDWI1650		

3	UAV 102 das	Predicted classification	
		Susc.	Tolerant
Actual classification	Susceptible	29	11
	Tolerant	9	47
Indices selected	CH_{DEM}, MCARI, NDVI, TGI		

4	UAV 152 das	Predicted classification	
		Susc.	Tolerant
Actual classification	Susceptible	33	7
	Tolerant	5	51
Indices selected	CH_{DEM}, PBI, REM, CARRE		

Table S2. Classification and mis-classification matrix for group of cultivars using ground measurements and UAV hyperspectral data 102 and 152 das. (1) Ground - 102 das, (2) Ground - 152 das, (3) UAV 102 das, (4) UAV 152 das

1	Ground 102 das	Predicted classification			
		A	B	C	D
Actual classification	A	40	4	3	1
	B	4	10	1	1
	C	4	1	6	1
	D	0	0	0	8
Indices selected	NDRI, PSRI, OCAR, 780_740				

2	Ground 152 das	Predicted classification			
		A	B	C	D
Actual classification	A	45	1	1	1
	B	2	7	4	3
	C	1	4	9	2
	D	1	3	0	12
Indices selected	WI, PRI, NPCI, WI, NDVI				

3	UAV 102 das	Predicted classification			
		A	B	C	D
Actual classification	A	37	3	8	0
	B	9	6	0	1
	C	5	1	10	0
	D	0	1	0	15
Indices selected	MCARI, PRI, TCARI, CH_{DEM}				

4	UAV 152 das	Predicted classification			
		A	B	C	D
Actual classification	A	44	0	3	1
	B	1	7	4	4
	C	3	3	6	4
	D	0	4	3	9
Indices selected	NDRE, ANTH, 785/700, DCNI				

Table S3. Additional SIs selected by the UDT model to classify the types of cultivar and seed providers.

SVIs	Equation	Traits	Reference
LCI	$(R_{850}-R_{710})/(R_{850}-R_{680})$	Chloropyll content	[74]
SIPI	$(R_{800} - R_{445})/(R_{800} - R_{680})$	Chlorophyll content	[75]
RGR	R_{683}/R_{510}	Anthocyanins	[76]
ARI	$(1/R_{550})$ - $(1/R_{700})$	Anthocyanins	[77]
MCARI	$[(R_{700} - R_{670}) - 0.2 * (R_{700} - R_{550})] * (R_{700}/R_{670})$	Chlorophyll content	[78]
PBI	R_{810}/R_{560}	Chlorophyll	[79]
REM	R_{750}/R_{720}-1	Chlorophyll content	[80]
CARRE	R_{760}-800*(1/R_{510}-520 - 1/R_{690}-710)	Carotenoids	[48]
NDRI	(TM3-TM7)/(TM3+TM7)	Residue cover / water content	[81]
PSRI	$(R_{678}-R_{500})/R_{750}$	Pigments	[82]
OCAR	R_{630}/R_{680}	Chlorophyll content	[83]
NPCI	$(R_{680} - R_{430})/ (R_{680} + R_{430})$	Chlorophyll / Carotenoids content	[84]
NDRE	$(R_{750}-R_{705})/(R_{750}+R_{705})$ Hunt et al 2011	Chlorophyll content	[85]
DCNI	$(R_{720}-R_{700})/(R_{700}-R_{670})/(R_{720}-R_{670}+0.03)$	Nitrogen content	[86]

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