

Table 1

GLCM Feature	Abbreviation	Formula
Sum Average	SA	$\sum_{k=0}^{2(N-1)} k P_{x+y}(k)$
Entropy	Ent	$-\sum_{i=0}^{N-1} \sum_{j=0}^{N-1} P_d(i,j) \log (P_d(i,j))$
Difference Entropy	DE	$-\sum_{k=0}^{N-1} P_{x-y}(k) \log (P_{x-y}(k))$
Sum Entropy	SE	$-\sum_{k=0}^{2(N-1)} P_{x+y}(k) \log (P_{x+y}(k))$
Variance	Var	$\sum_{i=0}^{N-1} \sum_{j=0}^{N-1} (i-\mu)^2 P_d(i,j)$
Difference Variance	DV	$\sum_{k=0}^{N-1} \left(k - \sum_{k=0}^{N-1} k P_{x-y}(k) \right)^2 P_{x-y}(k)$
Sum Variance	SV	$-\sum_{k=0}^{2(N-1)} \left(k - \sum_{k=0}^{2(N-1)} k P_{x+y}(k) \right)^2 P_{x+y}(k)$
Angular second moment (Uniformity)	ASM	$\sum_{i=0}^{N-1} \sum_{j=0}^{N-1} P_d(i,j)^2$
Inverse Difference Moment	IDM	$\sum_{i=0}^{N-1} \sum_{j=0}^{N-1} \frac{1}{1+(i-j)^2} P_d(i,j)$
Contrast	Con	$\sum_{i=0}^{N-1} \sum_{j=0}^{N-1} (i-j)^2 P_d(i,j)$
Correlation	Cor	$\sum_{i=0}^{N-1} \sum_{j=0}^{N-1} P_d(i,j) \frac{(i-\mu_x)(j-\mu_y)}{\sigma_x \sigma_y}$
Information Measure of Correlation-1	MOC-1	$\frac{HXY - HXY1}{\max(HX, HY)}$
Information Measure of Correlation-2	MOC-2	$[1 - \exp\{-2(HXY2 - HXY)\}]^{1/2}$

N is the number of gray levels, P_d is the normalized symmetric GLCM dimension, $P_d(i,j)$ is GLCM value on element (i,j) . P_{x+y} , P_{x-y} , HX , HY , HXY , $HXY1$, $HXY2$ were calculated as shown in Appendix B.

Table 2

From first-order statistics				From first- and second-order statistics		
Rank	Map	Variable	Date	Map	Variable	Date
Boruta						
1	Plant height	AVE	0626	Plant height	MOC-1	0712
2	GNDVI	RANGE	0716	NDVI	SV	0712
3	Plant height	MAX	0720	NDVI	DV	0712
4	GNDVI	AVE	0712	Plant height	AVE	0702
5	NDVI	SD	0712	GNDVI	DV	0724
DALEX						
1	Plant height	AVE	0626	NDVI	SV	0712
2	Plant height	MAX	0702	Plant height	SE	0712
3	Plant height	AVE	0702	NDVI	SE	0712
4	GNDVI	MAX	0530	NDVI	DV	0712
5	GNDVI	RANGE	0530	Plant height	Ent	0626
GA						
1	Plant height	RANGE	0618	Plant height	RANGE	0712
2	Plant height	AVE	0626	NDVI	SV	0712
3	GNDVI	RANGE	0716	NDVI	IDM	0702
4	WDVI	MAX	0724	NDVI	DV	0712
5	NDVI	SD	0712	GNDVI	MOC-2	0724
LASSO						
1	Plant height	AVE	0626	Plant height	AVE	0626
2	GNDVI	RANGE	0716	GNDVI	DV	0724
3	NDVI	MAX	0716	NDVI	SV	0716
4	Plant height	MAX	0702	GNDVI	Con	0618
5	Plant height	SKEW	0605	Plant height	MAX	0702
RFE						
1	Plant height	AVE	0626	NDVI	SV	0712
2	NDVI	MAX	0716	Plant height	MOC-1	0712
3	Plant height	MAX	0702	NDVI	DV	0712
4	Plant height	AVE	0702	NDVI	MAX	0716
5	NDVI	SD	0712	GNDVI	DV	0724

Table 3

Rank	From first-order statistics			From first- and second-order statistics		
	Map	Variable	Date	Map	Variable	Date
Boruta						
1	WDVI	RANGE	0618	WDVI	RANGE	0618
2	NDVI	AVE	0618	NDVI	AVE	0618
3	WDVI	AVE	0618	WDVI	AVE	0618
4	NDVI	AVE	0626	WDVI	SA	0618
5	GNDVI	AVE	0626	NDVI	AVE	0626
DALEX						
1	WDVI	AVE	0618	WDVI	SA	0618
2	NDVI	AVE	0724	NDVI	AVE	0626
3	WDVI	RANGE	0618	NDVI	AVE	0618
4	Plant height	RANGE	0618	WDVI	RANGE	0618
5	NDVI	AVE	0618	GNDVI	IDM	0712
GA						
1	WDVI	RANGE	0618	NDVI	IDM	0716
2	NDVI	MAX	0606	WDVI	RANGE	0618
3	NDVI	AVE	0618	GNDVI	SE	0724
4	NDVI	SD	0716	Plant height	Growth Rate	0530–0605
5	NDVI	SD	0524	WDVI	MAX	0606
LASSO						
1	NDVI	AVE	0618	GNDVI	Con	0618
2	Plant height	MAX	0724	Plant height	MAX	0724
3	NDVI	RANGE	0724	WDVI	SA	0626
4	NDVI	RANGE	0524	NDVI	AVE	0626
5	Plant height	SKEW	0712	NDVI	Cor	0712
RFE						
1	NDVI	AVE	0618	NDVI	AVE	0618
2	WDVI	RANGE	0618	WDVI	RANGE	0618
3	WDVI	AVE	0618	WDVI	AVE	0618
4	—	—	—	NDVI	AVE	0626
5	—	—	—	WDVI	SA	0618

Table 4

From first-order statistics				From first- and second-order statistics		
Rank	Map	Variable	Date	Map	Variable	Date
Boruta						
1	NDVI	AVE	0626	WDVI	RANGE	0618
2	GNDVI	AVE	0626	NDVI	AVE	0618
3	NDVI	MAX	0618	WDVI	AVE	0618
4	GNDVI	MAX	0611	WDVI	SA	0618
5	GNDVI	SD	0626	NDVI	AVE	0626
DALEX						
1	NDVI	RANGE	0606	WDVI	IDM	0618
2	NDVI	AVE	0626	NDVI	RANGE	0626
3	NDVI	AVE	0524	NDVI	AVE	0618
4	NDVI	MAX	0618	WDVI	AVE	0618
5	NDVI	MAX	0618	GNDVI	SA	0712
GA						
1	WDVI	SD	0712	NDVI	IDM	0716
2	NDVI	SD	0524	WDVI	RANGE	0618
3	WDVI	MAX	0606	GNDVI	AVE	0724
4	GNDVI	AVE	0626	Plant height	Growth rate	0530–0605
5	GNDVI	RANGE	0524	WDVI	MAX	0606
LASSO						
1	GNDVI	MAX	0611	GNDVI	Con	0618
2	GNDVI	AVE	0626	Plant height	MAX	0724
3	WDVI	SD	0606	WDVI	SA	0626
4	GNDVI	AVE	0712	NDVI	AVE	0626
5	NDVI	MAX	0606	NDVI	Cor	0712
RFE						
1	GNDVI	AVE	0626	NDVI	AVE	0618
2	NDVI	AVE	0626	WDVI	RANGE	0618
3	NDVI	MAX	0618	WDVI	AVE	0618
4	NDVI	MAX	0606	NDVI	AVE	0626
5	NDVI	SD	0626	WDVI	SA	0618

Table 5

From first-order statistics					
Model	Boruta	DALEX	GA	LASSO	RFE
Shoot mass (SM) [kg plant ⁻¹]					
Random forest	0.081	0.101	0.077	0.102	0.104
Ridge regression	0.120	0.121	0.113	0.139	0.121
SVM	0.080	0.086	0.076	0.097	0.099
Fruit weight (FW) [kg plant ⁻¹]					
Random forest	0.262	0.261	0.247	0.293	0.451
Ridge regression	0.926	0.906	0.905	0.935	0.896
SVM	0.268	0.272	0.274	0.349	0.297
Number of fruits (FN) [piece plant ⁻¹]					
Random forest	3.950	4.447	3.130	3.868	4.450
Ridge regression	9.499	7.968	9.445	5.644	6.615
SVM	4.086	4.455	4.219	4.070	4.259
From first- and second-order statistics					
Model	Boruta	DALEX	Genetic	LASSO	RFE
Shoot mass (SM) [kg plant ⁻¹]					
Random forest	0.085	0.075	0.068	0.062	0.061
Ridge regression	0.103	0.093	0.050	0.117	0.080
SVM	0.097	0.085	0.051	0.098	0.093
Fruit weight (FW) [kg plant ⁻¹]					
Random forest	0.337	0.292	0.234	0.258	0.292
Ridge regression	0.216	0.386	0.239	0.414	0.313
SVM	0.275	0.289	0.273	0.298	0.271
Number of fruits (FN) [piece plant ⁻¹]					
Random forest	4.659	4.232	3.502	3.586	4.213
Ridge regression	4.853	5.540	3.969	8.780	4.181
SVM	4.003	3.404	2.769	3.318	4.413