Supplementary Materials

Table S1. Description of vegetation indices.

Index	Description	Formula	Reference
CLG	Green Band Chlorophyll Index	redEdge3/green - 1	[61]
CLRE	Red-Edge Band Chlorophyll Index	redEdge3/redEdge1 - 1	[61]
CTVI*	Corrected Transformed Vegetation Index	(NDVI + 0.5)/sqrt(abs(NDVI + 0.5))	[62]
DVI	Difference Vegetation Index	s * nir - red	[63]
EVI	Enhanced Vegetation Index	G * ((nir - red)/(nir + C1 * red - C2 * blue + L_evi))	[64]
GEMI	Global Environmental Monitoring Index	$(((nir^2 - red^2) * 2 + (nir * 1.5) + (red * 0.5))/(nir + red + 0.5)) * (1 - ((((nir^2 - red^2) * 2 + (nir * 1.5) + (red * 0.5))/(nir + red + 0.5)) * 0.25)) - ((red - 0.125)/(1 - red))$	[65]
GCVI*	Green Chlorophyll Vegetation Index	(nir/green)-1	[66]
GNDVI*	Green Normalized Difference Vegetation Index	(nir - green)/(nir + green)	[67]
MCARI*	Modified Chlorophyll Absorption Ratio Index	((redEdge - red) - (redEdge - green)) * (redEdge/red)	[68]
MNDWI	Modified Normalized Difference Water Index	(green - swir2)/(green + swir2)	[69]
MSAVI*	Modified Soil-Adjusted Vegetation Index	$nir + 0.5 - (0.5 * sqrt((2 * nir + 1)^2 - 8 * (nir - (2 * red))))$	[70]
MSAVI2	Modified Soil-Adjusted Vegetation Index 2	$(2 * (nir + 1) - sqrt((2 * nir + 1)^2 - 8 * (nir - red)))/2$	[70]
NBRI	Normalized Burn Ratio Index	(nir - swir3)/(nir + swir3)	[71]
NDRE*	Normalized Difference Red Edge Index	(nir - redEdge)/(nir + redEdge)	[72]
NDREI1	Normalized Difference Red Edge Index 1	(redEdge2 - redEdge1)/(redEdge2 + redEdge1)	[67]
NDREI2	Normalized Difference Red Edge Index 2	(redEdge3 - redEdge1)/(redEdge3 + redEdge1)	[72]
NDVI*	Normalized Difference Vegetation Index	(nir - red)/(nir + red)	[73]
NDWI	Normalized Difference Water Index	(green - nir)/(green + nir)	[74]
NDWI2	Normalized Difference Water Index	(nir - swir2)/(nir + swir2)	[75]
NRVI	Normalized Ratio Vegetation Index	(red/nir - 1)/(red/nir + 1)	[76]
RECI*	Red-Edge Chlorophyll Index	(nir/redEdge)-1	[58]
REIP	Red-Edge Inflection Point	0.705 + 0.35 * ((red + redEdge3/(2 - redEdge1))/(redEdge2 - redEdge1)	[76]
RVI	Ratio Vegetation Index	red/nir	
SATVI	Soil-Adjusted Total Vegetation Index	(swir2 - red)/(swir2 + red + L) * (1 + L) - (swir3/2)	[77]
SAVI*	Soil-Adjusted Vegetation Index	(nir - red) * (1 + L)/(nir + red + L)	[78]
SLAVI	Specific Leaf Area Vegetation Index	nir/(red + swir2)	[79]
SR*	Simple Ratio Vegetation Index	nir/red	[80]
TTVI*	Thiam's Transformed Vegetation Index	sqrt(abs((nir - red)/(nir + red) + 0.5))	[81]
TVI	Transformed Vegetation Index	sqrt((nir - red)/(nir + red) + 0.5)	[82]
WDVI	Weighted Difference Vegetation Index	nir - s * red	[63]

**Table S2.** Confusion matrices of RF and SVM for the combination of the optical and SAR datasets.

Prediction	Banana	Building	Cassava	Forest	Grassland	Maize	Bare ground/ road	Water	Producer Accuracy
Random Forest (RF) Confusion Matrix									
Banana	195	18	7	9	8	4	10	0	77.7
Building	7	87	0	0	0	0	9	0	84.5
Cassava	3	0	157	4	16	17	4	0	78.1

|	Banana	Building	Cassava	Forest/Vegetation	Grassland	Maize	Bareground/Road	Others	UA
Forest/Vegetation	16	0	10	900	36	2	4	0	93.0
Grassland	5	0	13	45	417	8	4	0	84.8
Maize	4	2	11	3	19	146	17	0	72.3
Bareground/Road	5	21	2	0	14	14	91	0	61.9
Others	0	0	0	0	0	0	0	1257	100.0
User accuracy (UA)	83.0	68.0	78.5	93.7	81.8	76.4	65.5	100.0	

Overall accuracy (OA): 89.8 and Kappa coefficient (KC):86.8

Support Vector Machine (SVM) confusion matrix

|	Banana	Building	Cassava	Forest/Vegetation	Grassland	Maize	Bareground/Road	Water	UA
Banana	174	21	9	9	10	3	13	0	72.8
Building	11	83	0	0	0	0	9	0	80.6
Cassava	5	0	153	7	19	21	4	0	73.2
Forest/Vegetation	25	0	11	904	26	3	4	0	92.9
Grassland	6	0	11	39	420	8	3	0	86.2
Maize	10	1	13	2	26	144	17	0	67.6
Bareground/Road	4	23	3	0	9	12	89	0	63.6
Water	0	0	0	0	0	0	0	1257	100.0
UA	74.0	64.8	76.5	94.1	82.4	75.4	64.0	100.0	

Overall accuracy (OA): 89.0 and Kappa coefficient (KC):85.9
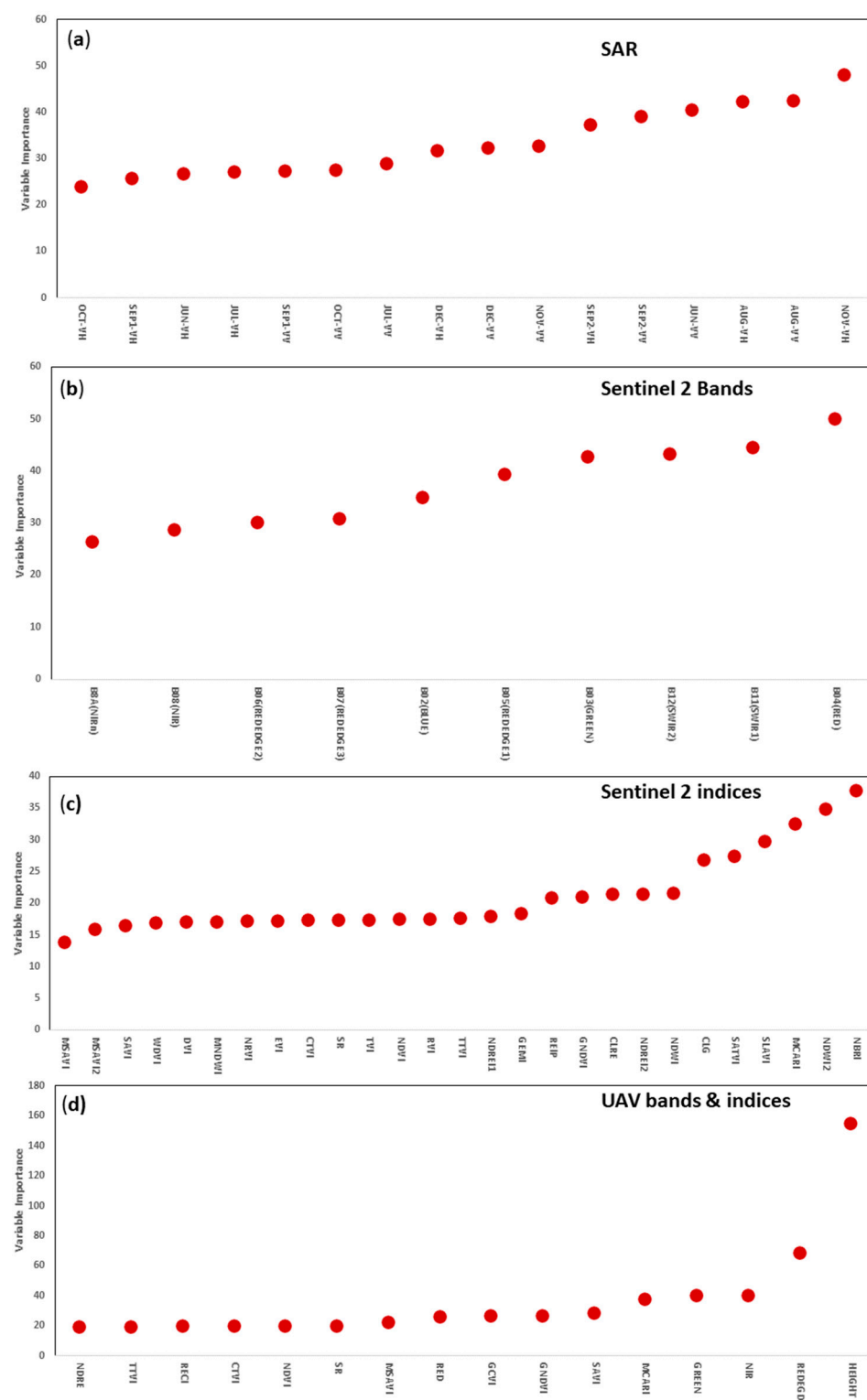
Figure S1. The importance ranking of the predictor variables of Random Forest using the Boruta package: (**a**) SAR dataset, (**b**) Sentinel 2A spectral bands, (**c**) Sentinel 2A vegetation indices, and (**d**) UAV spectral bands and vegetation indices.
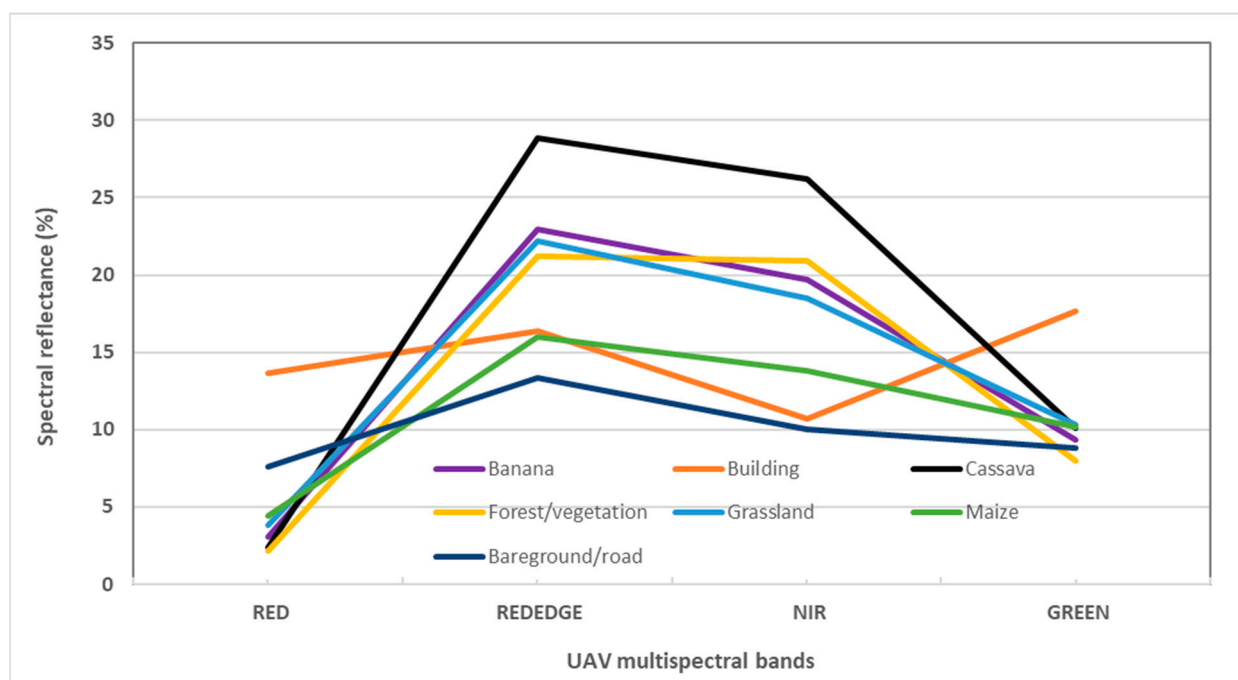
Figure S2. Spectral profile of UAV multispectral reflectance bands for the major landcover types in the study area.
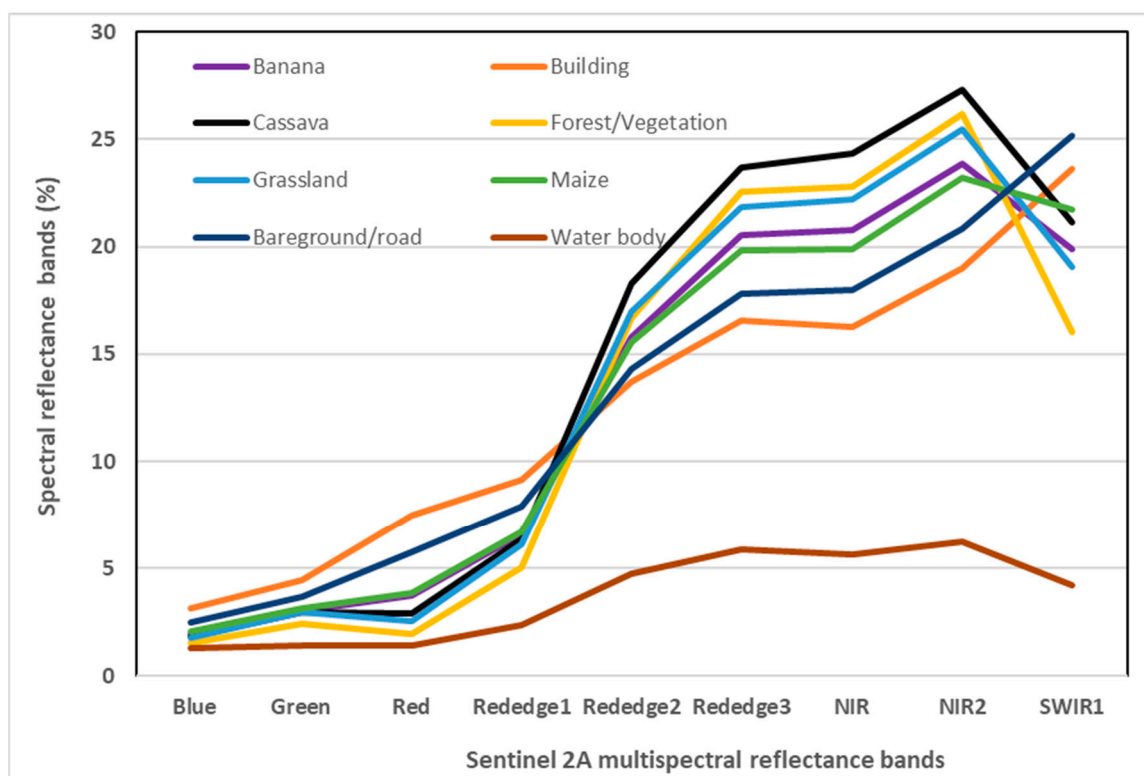
Figure S3. Spectral profile of Sentinel 2A multispectral reflectance bands for the major landcover types in the study area.