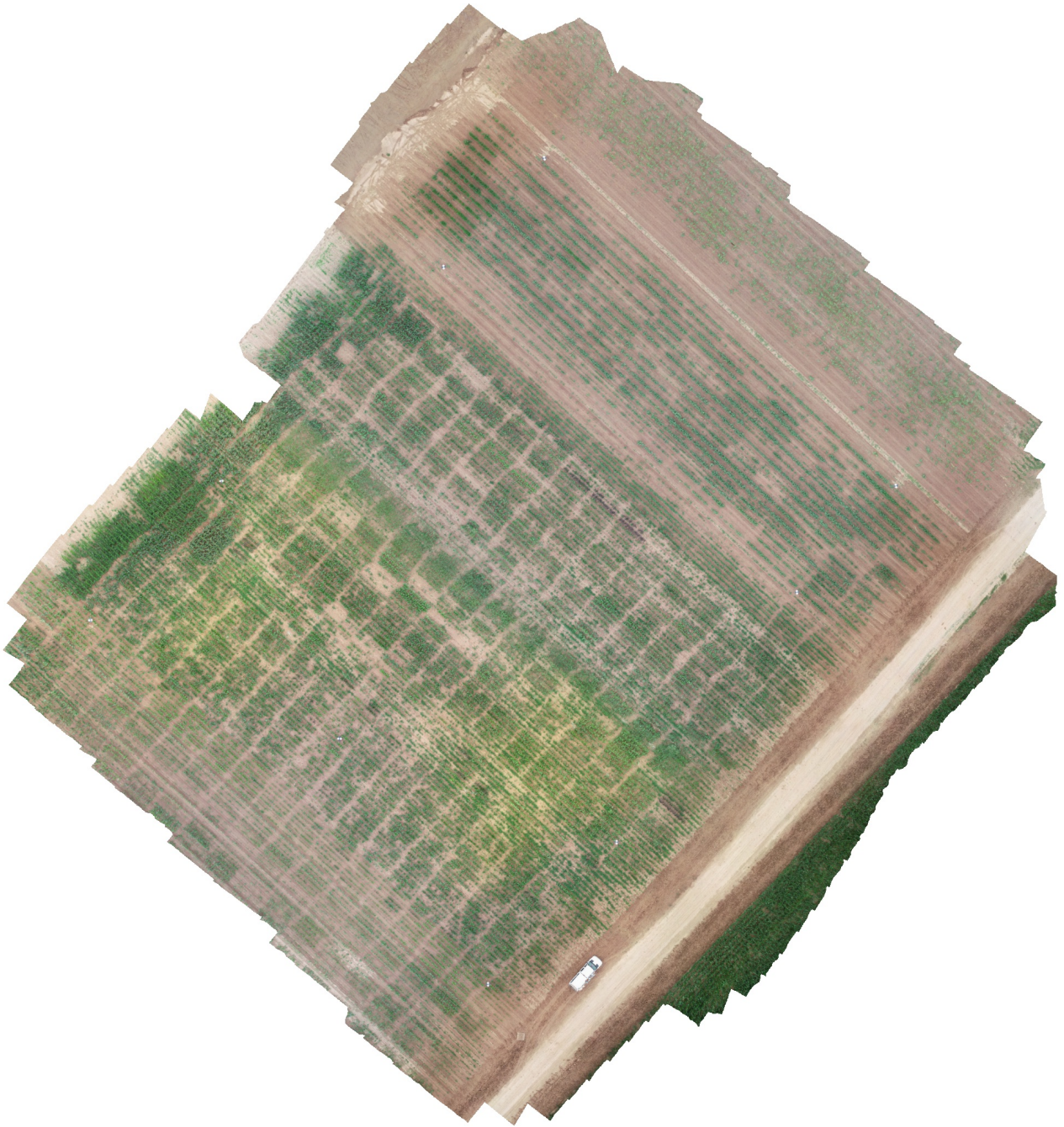


Agisoft Metashape

Processing Report
05 September 2019



Survey Data

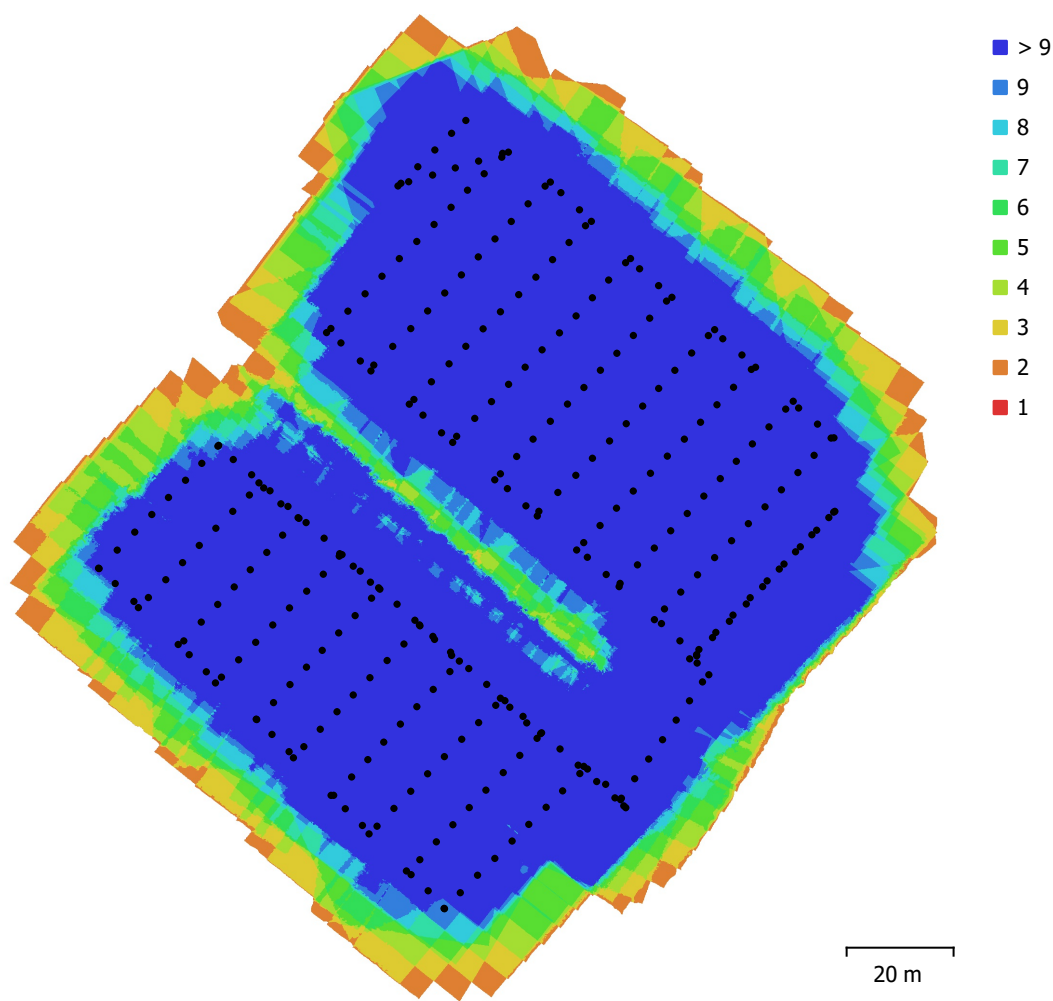


Fig. 1. Camera locations and image overlap.

Number of images:	321	Camera stations:	321
Flying altitude:	27.4 m	Tie points:	125,921
Ground resolution:	6.49 mm/pix	Projections:	391,867
Coverage area:	0.0187 km ²	Reprojection error:	3.46 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC6310S (8.8mm)	5472 x 3648	8.8 mm	2.41 x 2.41 μm	No

Table 1. Cameras.

Camera Calibration

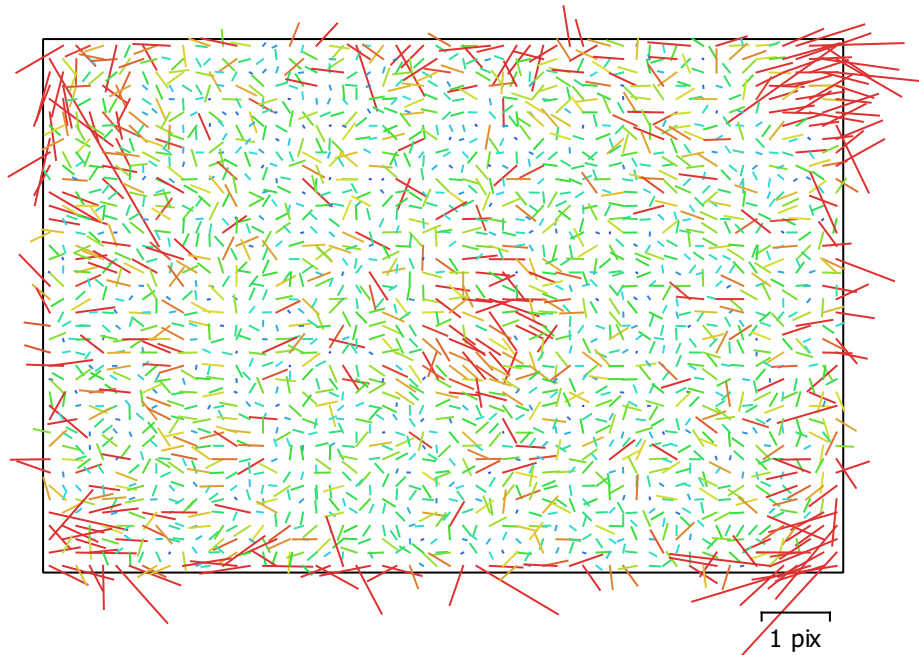


Fig. 2. Image residuals for FC6310S (8.8mm).

FC6310S (8.8mm)

321 images

Type
Frame

Resolution
5472 x 3648

Focal Length
8.8 mm

Pixel Size
2.41 x 2.41 μ m

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2	P3	P4
F	3923.53	11	1.00	0.54	-0.10	0.01	0.10	0.22	-0.26	0.35	-0.42	0.11	0.23	0.11	-0.10
Cx	22.726	0.37		1.00	-0.16	0.02	0.19	0.10	-0.12	0.17	-0.21	0.40	0.13	0.06	-0.05
Cy	9.46748	0.36			1.00	-0.16	-0.03	-0.02	0.02	-0.03	0.04	0.05	0.26	-0.21	0.16
B1	0.0224219	0.034				1.00	0.03	0.04	-0.04	0.04	-0.03	0.03	-0.07	0.05	-0.03
B2	0.12462	0.034					1.00	0.02	-0.02	0.03	-0.04	0.10	0.03	0.00	0.00
K1	0.0203213	0.00059						1.00	-0.97	0.92	-0.86	0.01	0.04	0.05	-0.05
K2	-0.0770059	0.0034							1.00	-0.98	0.95	-0.01	-0.04	-0.07	0.07
K3	0.163371	0.008								1.00	-0.99	0.02	0.05	0.08	-0.09
K4	-0.116199	0.0064									1.00	-0.02	-0.06	-0.10	0.10
P1	0.000201391	7.8e-006										1.00	0.33	-0.30	0.27
P2	0.00247585	3.4e-005											1.00	-0.88	0.78
P3	1.7231	0.077												1.00	-0.97
P4	-0.833302	0.084													1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

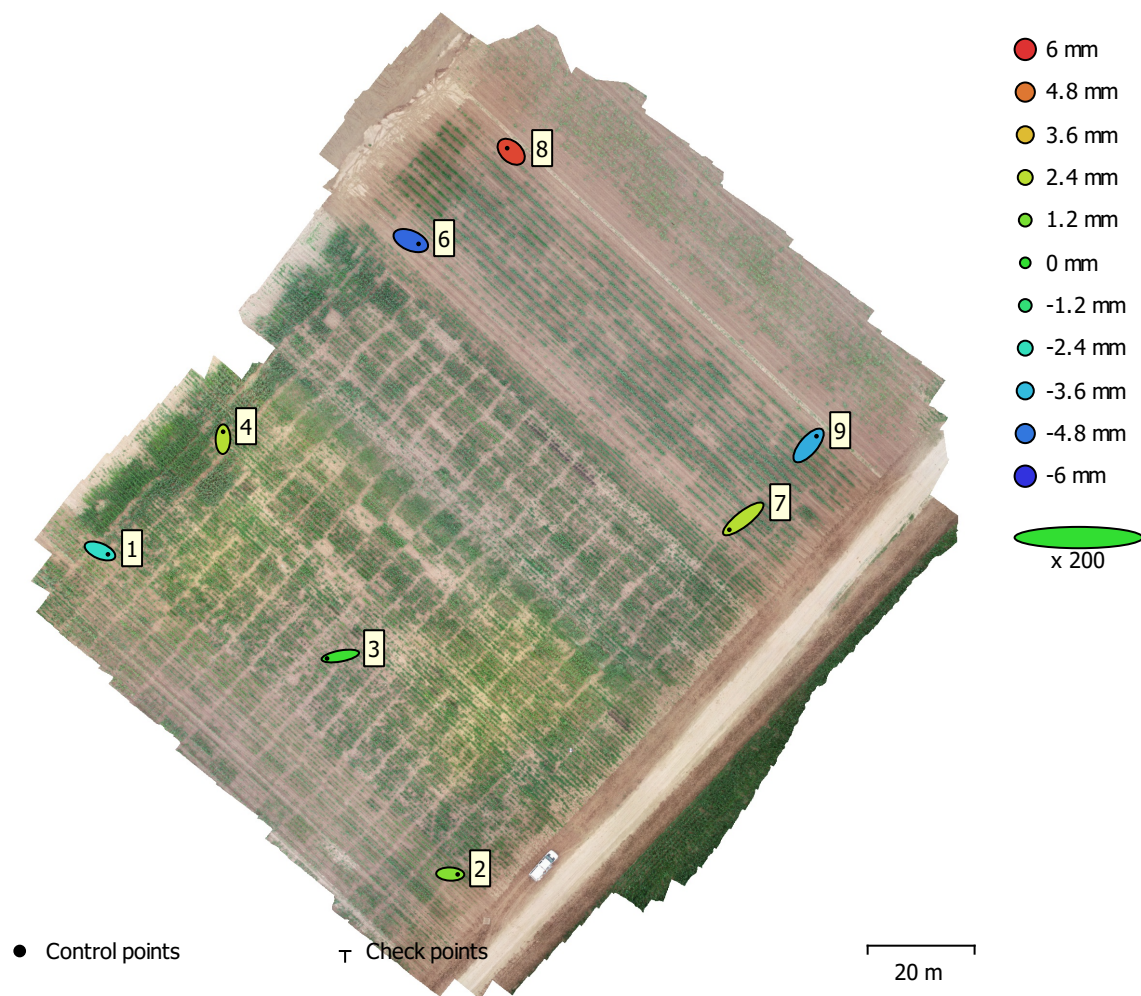


Fig. 3. GCP locations and error estimates.

Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.

Estimated GCP locations are marked with a dot or crossing.

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
8	1.65668	1.144	0.339112	2.01329	2.04165

Table 3. Control points RMSE.

X - Longitude, Y - Latitude, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
7	-2.60296	-2.02586	0.229735	3.3064	0.005 (19)
3	-2.48498	-0.453737	0.0187667	2.52613	0.005 (17)
9	1.48116	1.72926	-0.386133	2.30939	0.007 (15)
6	1.45504	-0.622305	-0.507985	1.66206	0.009 (13)
8	-0.746839	0.668526	0.565396	1.15081	0.008 (10)
1	1.48471	-0.628128	-0.261368	1.63316	0.011 (7)
4	0.0259999	1.39184	0.226711	1.41043	0.021 (6)
2	1.39013	-0.0601188	0.142531	1.39871	0.005 (5)
Total	1.65668	1.144	0.339112	2.04165	0.009

Table 4. Control points.
X - Longitude, Y - Latitude, Z - Altitude.

Digital Elevation Model

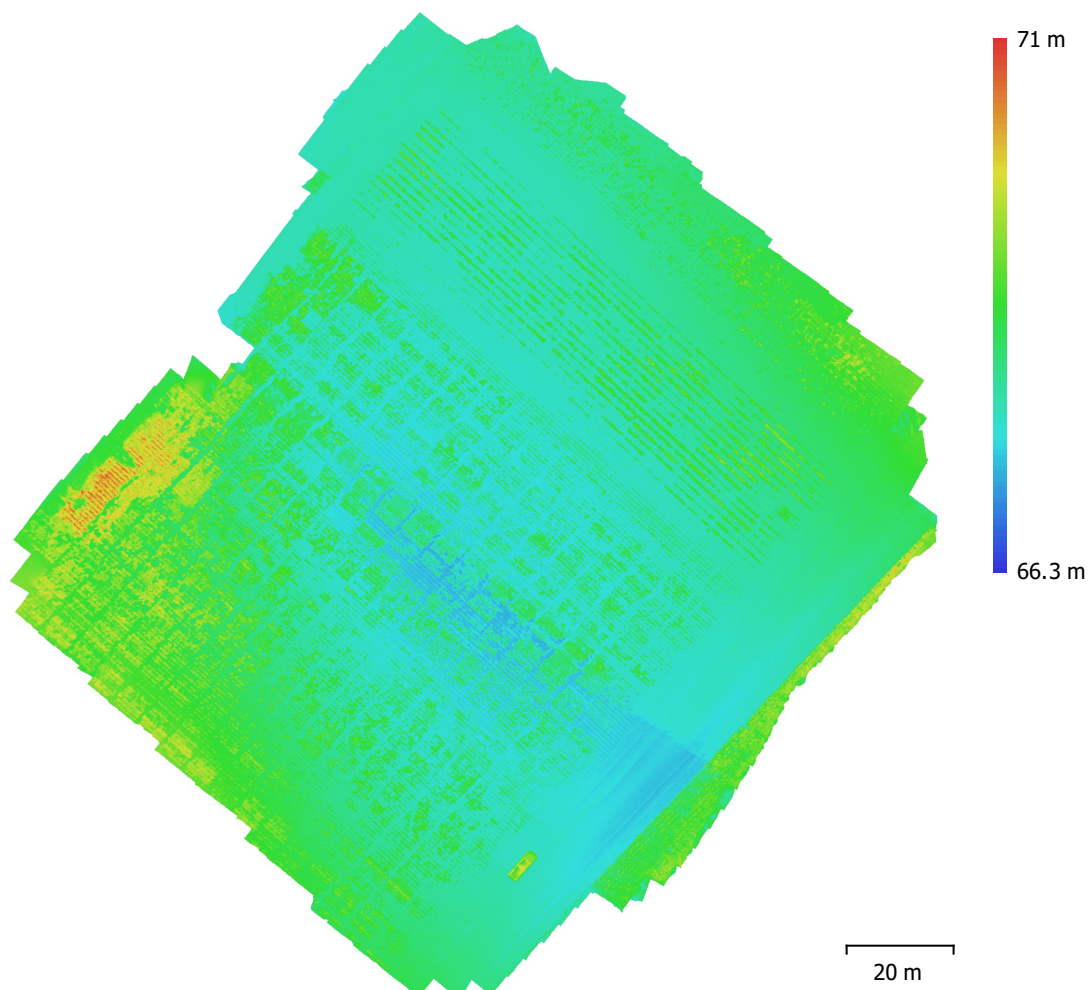


Fig. 4. Reconstructed digital elevation model.

Resolution: 1.3 cm/pix
Point density: 0.594 points/cm²

Processing Parameters

General

Cameras	321
Aligned cameras	321
Markers	8
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	125,921 of 138,105
RMS reprojection error	0.153441 (3.46345 pix)
Max reprojection error	1.29427 (62.2817 pix)
Mean key point size	20.5261 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.43373

Alignment parameters

Accuracy	Low
Generic preselection	Yes
Reference preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	No
Matching time	2 minutes 27 seconds
Alignment time	2 minutes 5 seconds

Optimization parameters

Parameters	f, b1, b2, cx, cy, k1-k4, p1-p4
Adaptive camera model fitting	No
Optimization time	12 seconds
Software version	1.5.3.8469

Depth Maps

Count	321
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	2 hours 19 minutes
Software version	1.5.3.8469

Dense Point Cloud

Points	256,531,690
Point colors	3 bands, uint8

Depth maps generation parameters

Quality	High
Filtering mode	Mild
Processing time	2 hours 18 minutes

Dense cloud generation parameters

Processing time	1 hours 22 minutes
Software version	1.5.3.8469

Model

Faces	51,052,729
Vertices	25,535,884
Vertex colors	3 bands, uint8

Depth maps generation parameters

General

Quality	High
Filtering mode	Mild
Processing time	2 hours 18 minutes

Reconstruction parameters

Surface type	Height field
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	28 minutes 22 seconds
Software version	1.5.3.8469

DEM

Size	16,685 x 16,759
Coordinate system	WGS 84 (EPSG::4326)

Reconstruction parameters

Source data	Dense cloud
Interpolation	Enabled
Processing time	2 minutes 49 seconds
Software version	1.5.3.8469

Orthomosaic

Size	27,012 x 28,731
Coordinate system	WGS 84 (EPSG::4326)
Colors	3 bands, uint8

Reconstruction parameters

Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Processing time	17 minutes 38 seconds
Software version	1.5.3.8469

Software

Version	1.5.3 build 8469
Platform	Windows 64