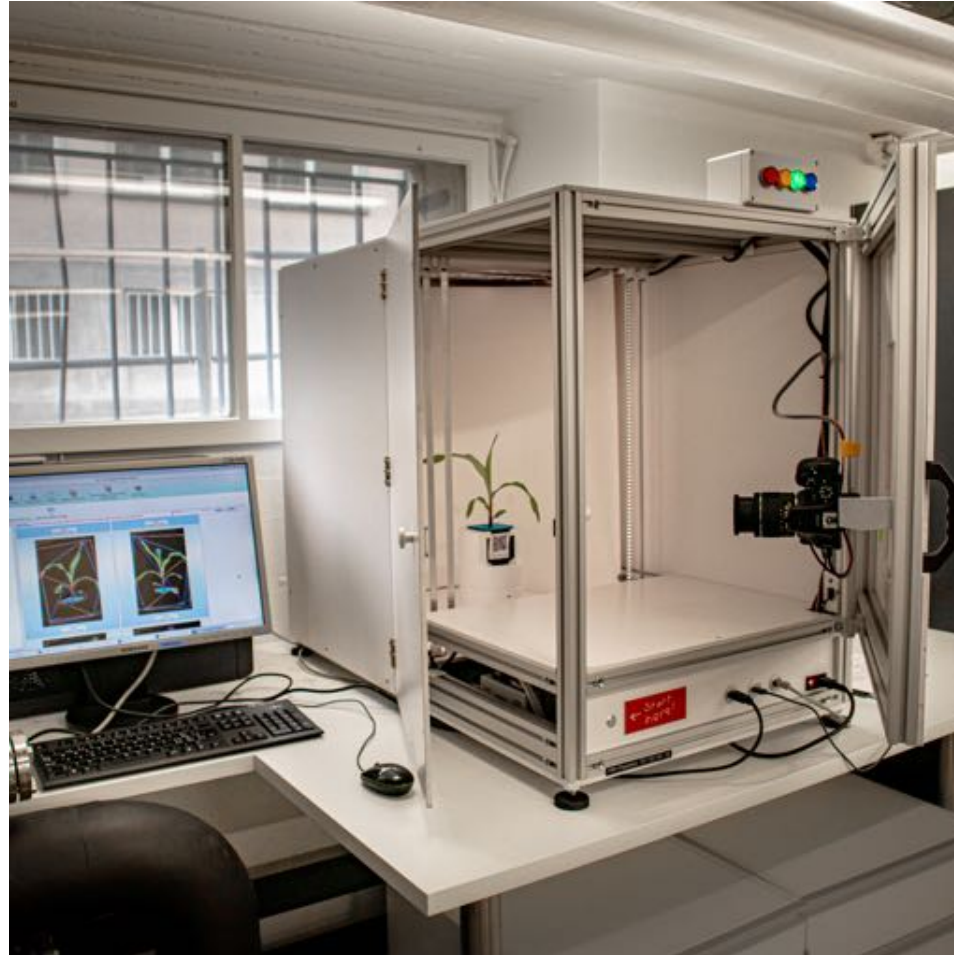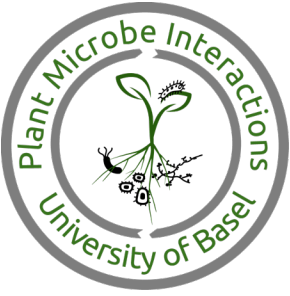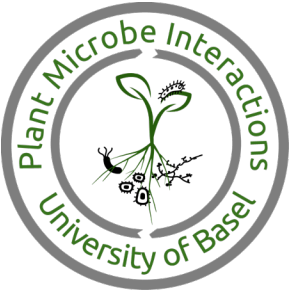# Phenobox

Plant Microbe Interactions – University of Basel
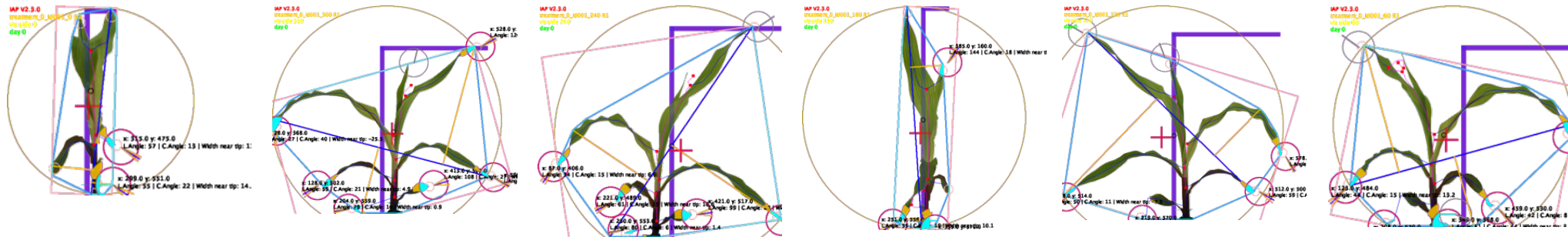
Automated picturing

*Each plant is identified by a unique QR code
and phtographed from different angles*

Automated phenotyping

Each photo is processed by a automated image analysis algorithm to measure around 200 phenotypic features

Phenotyping output

*The image analysis results are stored in a table format
for further downstream analysis*

	Angle	Plant ID	Condition	Species	Genotype	leaf count	leaf curvature avg	leaf curvature sum	leaf length mean [px]	leaf length sum [px]	leaf width mean
2	0	Id001	ctrl	Maize	B73	7	0.196332778	1.374329448	77	544	56.4044
3	60	Id001	ctrl	Maize	B73	5	0.596941945	4.178593615	256	1281	39.3918
4	120	Id001	ctrl	Maize	B73	6	0.839693816	5.877856715	254	1529	39.4133
5	180	Id001	ctrl	Maize	B73	7	0.152547413	1.06783189	109	763	56.7891
6	240	Id001	ctrl	Maize	B73	6	0.553603358	3.875223506	222	1337	40.9169
7	300	Id001	ctrl	Maize	B73	6	0.513438446	4.107507569	232	1397	36.5832
8	0	Id002	ctrl	Maize	B73	5	0.335748591	2.014491549	161	807	52.3
9	60	Id002	ctrl	Maize	B73	6	0.731429425	5.120005978	188	1130	36.3
10	120	Id002	ctrl	Maize	B73	5	0.547701896	3.286211373	245	1225	38.7
11	180	Id002	ctrl	Maize	B73	5	0.65734376	3.94406256	206	1030	41.4
12	240	Id002	ctrl	Maize	B73	6	0.50485847	3.53400929	170	1025	42.2
13	300	Id002	ctrl	Maize	B73	5	0.445671075	3.119697525	254	1273	37.499
14	0	Id003	ctrl	Maize	B73	3	0.425583911	1.702335644	321	965	42.253
15	60	Id003	ctrl	Maize	B73	5	0.545763238	3.820342663	256	1282	38.358
16	120	Id003	ctrl	Maize	B73	6	0.330794042	2.646352337	151	908	50.414
17	180	Id003	ctrl	Maize	B73	4	0.741730762	2.966923046	258	1035	43.313
18	240	Id003	ctrl	Maize	B73	7	0.388077319	3.492695871	173	1212	38.509
19	300	Id003	ctrl	Maize	B73	6	0.895784178	5.374705069	162	973	45.946

+200 feature columns

Example of a downstream analysis

The image analysis results are used to distinguish different plant species

- median per plant for each feature
- z-score transformation
- PCA
- k-mer classification with PC's > 90% of variation