Table S1: Height parameters derived from point clouds and used as explanatory variables for modelling crop biomass. The mean and standard deviation of each metric across all sampling dates and plots is given.

| Metric | Description | Mean / Standard deviation |
|--------|-------------|---------------------------|
| **Hmax** | Maximum crop height | 0.288 / 0.496 |
| **Hmean** | Mean crop height | 0.029 / 0.028 |
| **Hsd** | Standard deviation of crop height | 0.029 / 0.041 |
| **Hmedian** | Median crop height | 0.022 / 0.021 |
| **Hskew** | Skewness of crop height | 2.171 / 2.661 |
| **Hkurt** | Kurtosis of crop height | 19.319 / 97.589 |
| **Hcv** | Coefficient of variation for crop height | 0.978 / 0.843 |
| **Hq70** | 70th percentile of crop height | 0.060 / 0.062 |
| **Hq80** | 80th percentile of crop height | 0.071 / 0.085 |
| **Hq90** | 90th percentile of crop height | 0.088 / 0.110 |
| **Hq95** | 95th percentile of crop height | 0.106 / 0.135 |
| **Hq99** | 99th percentile of crop height | 0.149 / 0.205 |
| **Hrelief** | Crop canopy relief height (Hmean-Hmin)/(Hmax-Hmin) | 0.137 / 0.068 |

Table S2: Overview of the prediction performance of the model validation for four ML approaches (PLS: partial least squares, SVM: support vector machines, RFR: random forest regression, and GBT: gradient boosting trees) and three crops (eggplant, tomato, and cabbage). Values in bold represent the model with the best prediction of biomass

| Crop | Machine learning method used for analysis | Variables used for predicting biomass | R2 | RMSE | rel.RMSE | Bias |
|------|-------------------------------------------|----------------------------------------|-----|------|----------|------|
| Eggplant | PLS | Height | 0.71 | 0.47 | 0.20 | -0.05 |
| | | Spectral | 0.90 | 0.27 | 0.12 | 0.01 |
| | | Fusion | 0.90 | 0.27 | 0.12 | 0.02 |
| | SVM | Height | 0.93 | 0.22 | 0.10 | 0.00 |
| | | Spectral | 0.93 | 0.23 | 0.10 | -0.02 |
| | | Fusion | 0.92 | 0.23 | 0.10 | -0.02 |
| | RFR | Height | 0.94 | 0.21 | 0.09 | 0 |
| | | **Spectral** | **0.96** | **0.17** | **0.07** | **-0.02** |
| | | **Fusion** | **0.96** | **0.17** | **0.07** | **-0.02** |
| | GBT | Height | 0.92 | 0.25 | 0.11 | 0.02 |
| | | Spectral | 0.96 | 0.18 | 0.08 | 0.01 |
| | | Fusion | 0.95 | 0.18 | 0.08 | 0.01 |
| Tomato | PLS | Height | 0.75 | 0.37 | 0.18 | 0.00 |
| | | Spectral | 0.78 | 0.36 | 0.17 | 0.01 |
| | | Fusion | 0.70 | 0.41 | 0.20 | -0.02 |
| | SVM | Height | 0.81 | 0.33 | 0.16 | 0.06 |
| | | Spectral | 0.78 | 0.38 | 0.18 | 0.03 |
| | | Fusion | 0.84 | 0.30 | 0.15 | 0.04 |
| | RFR | **Height** | **0.92** | **0.21** | **0.10** | **0.01** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Spectral | 0.69 | 0.42 | 0.20 | 0.01 |
| | | Fusion | 0.90 | 0.23 | 0.11 | 0.02 |
| | GBT | Height | 0.85 | 0.3 | 0.14 | 0.01 |
| | | Spectral | 0.72 | 0.40 | 0.19 | 0.02 |
| | | Fusion | 0.85 | 0.29 | 0.14 | 0.00 |
| Cabbage | PLS | Height | 0.88 | 0.28 | 0.12 | 0.00 |
| | | Spectral | 0.92 | 0.23 | 0.10 | 0.00 |
| | | Fusion | 0.92 | 0.23 | 0.10 | 0.01 |
| | SVM | Height | 0.91 | 0.25 | 0.11 | -0.01 |
| | | Spectral | 0.92 | 0.24 | 0.10 | -0.02 |
| | | Fusion | 0.91 | 0.25 | 0.11 | -0.12 |
| | RFR | **Height** | **0.95** | **0.19** | **0.08** | **-0.01** |
| | | Spectral | 0.93 | 0.22 | 0.09 | -0.01 |
| | | Fusion | 0.94 | 0.20 | 0.09 | -0.01 |
| | GBT | Height | 0.91 | 0.25 | 0.11 | -0.01 |
| | | Spectral | 0.88 | 0.29 | 0.13 | -0.03 |
| | | Fusion | 0.88 | 0.29 | 0.12 | -0.04 |