This publicly available dataset contains 1613 RGB-D images of field-grown broccoli plants. The dataset also includes the polygon and circle annotations of the broccoli heads.

The broccoli heads in the images were subject to various degrees of natural and man-made leaf occlusion. The images were acquired in July and August 2020 on a broccoli field in Sexbierum (The Netherlands). The broccoli cultivar was Ironman.

The dataset belongs to the paper “Image-based size estimation of broccoli heads under varying degrees of occlusion”. This paper has been submitted at Biosystems Engineering journal.

The structure and contents of the dataset is as follows:

annotations.zip
This zip-file contains three subfolders with annotations. The annotations were done with the LabelMe software (version 4.5.6). The LabelMe software (https://github.com/wkentaro/labelme) can also be used to visualize the annotations (place the images and the json files in the same folder).

/circle_annotations
Circle annotations on the amodal region of the broccoli heads in JSON files (Microsoft COCO format). The amodal region is the combined region of the visible and the occluded part of the broccoli head.

/mask_annotations
Polygon annotations on the visible region of the broccoli heads in JSON files (Microsoft COCO format).. These annotations are the default annotations to train an instance-segmentation algorithm, like Mask R-CNN or YOLACT++.

/orcnn_annotations
The combined circle and polygon annotations of the broccoli heads in JSON files (Microsoft COCO format). These are the preferred annotations to train a dual instance-segmentation algorithm, like ORCNN. Further documentation can be found at:
https://git.wur.nl/blok012/sizecnn/-/blob/master/ANNOTATE.md

camera_intrinsics.zip
This folder contains the camera-intrinsics file (JSON) of the Intel Realsense D435 that was used to acquire the RGB-D images.

ground_truth_measurements.zip
This folder contains the data of the ground-truth measurements. The file *groundtruth_measurements_broccoli.csv* summarizes the diameters (in mm) and the pixel locations of the measured broccoli heads. The file *visible_pixel_ratios_rgb_depth.csv* summarizes the visible pixel ratios of the broccoli heads in the RGB image and in the registered depth image.

rgbd_images.zip
This folder contains the 1613 RGB-D image-pairs from the occluded broccoli heads. The folder contains 1613 three-channel RGB images and 1613 one-channel depth images. Both are in PNG format. Refer to the software function “pixel_to_mm” to obtain a three-dimensional point cloud from the depth images (https://git.wur.nl/blok012/sizecnn/-/blob/master/Diameter_estimation_VisibleMasks.ipynb)