

## At a glance

### Vehicle

- Imaging system: jointly developed by Strube and Fraunhofer EZRT
- Self-navigating, commercially available carrier platform
- Light, compact, and manoeuvrable
- Electric drives
- Minimum battery life of 8 hours

### Navigation

- Precise autonomous navigation with rtk-GPS

### Measurement

- Measuring system uses multispectral cameras (RGB colour and near-infrared)
- Automatic image evaluation algorithm to distinguish beets from weeds
- Exact, objective assessment in repeated measurements
- Photographic recording of each individual plant
- Leaf area measurement from pinhead size to eight-leaf stage
- Measuring speed of 2.4 km/h or 24,000 plants per hour



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## phenoFieldBot

# Precise, Autonomous Plant Measurement





## Operating principle

- Self-navigating field robot
- Measures field emergence and plant development on our trial fields automatically and objectively
- Describes the visual appearance of each plant in terms of its size, shape and surface form
- Measures leaf area and soil coverage
- Classifies each plant into sugar beet or weed using artificial intelligence
- Counts and locates every individual plant in the field
- Tracks growth development including mortality of each individual plant



## Questions investigated with phenoFieldBot:

### 1. Impact of insecticides and fungicides

- Speed and dynamics of field emergence
- Impact of seed activation on field emergence and crops in combination with new seed treatments
- Measurement of mortality rate after field emergence resulting from lack of protective treatment

### 2. Comparison of varieties

- Speed and dynamics of field emergence
- Homogeneity
- Plant stand
- Leaf orientation

### 3. Effects of different stress situations

- Heat and drought
- Herbicides