

Detection of volunteer potato plants

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Problems

Volunteer potato plants are an important source of the spread of *Phytophthora infestans* because:

- Plants are not sprayed preventive and curative
- Removal of volunteer plants is labour and cost intensive
- No machines are available that remove volunteer plants automatically within the crop row

Research

Automatic detection and removal of volunteer plants is required and is being developed:

- Detection with colour and near-infrared cameras and machine vision algorithms
- Controlled light conditions with five lamps and detection above three sugar beet crop rows
- What is the difference of crop growth stages of sugar beet plants and volunteer potato plants?
- Is the computer able to teach itself the classes sugar beet and volunteer potato plant

Within different experimental fields sugar beets and volunteer potato plants have been detected.

Results

Machine vision detection above three sugar beet rows:

- Detection of sugar beet and volunteer potato plants was successful under changing crop and weed conditions
- Colour and near infrared features were required for discrimination between the two classes
- Each square centimeter of green vegetation was classified and potato plants were identified for spraying with a micro-sprayer

Integration on prototype machine:

- Measurement platform is finished
- Field demonstrations for future users of the system

Practice

- Volunteer potato plants will be automatically detected and controlled – this reduces labour costs
- More and better control of volunteer potato plants results in a lower disease pressure of *Phytophthora infestans*

