Mechatronic system for automated attaching of the supporting wires in high-trellis hop gardens

**JOINT PROJECT** (2008-2010) funded by the German Federal Agency for Food and Agriculture (BLE)
Background and motivation

- In Germany **18,500 ha** cultivated area under hop thereof more than 15,500 ha in Bavaria
- Predominantly 7 or 8 m high **trellis** systems
- Annual replacement of the support wires (1,2 – 1,4 mm thick iron wire)

**Manual fastening** of the support wire:
- 3 workers-platform 12 man-hours and 3 tractor-hours per ha
- 2 workers-platform 15 man-hours and 5 tractor-hours per ha

**Problems** by manual fastening:
- Accident risk
- Ergonomically very uncomfortable task
- Dependent on the weather conditions
Optimisation and development tasks

Subsystem for positioning
Optimisation and development tasks

Subsystem for wire attaching
Optimisation and development tasks

*Intermediate storage of the wire*
Optimisation and development tasks

External hydraulic power unit
Optimisation and development tasks

- Subsystem for positioning
- Subsystem for wire attaching
- Intermediate storage of the wire
- External hydraulic power unit
Results
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- Area capacity between 0.21 and 0.23 ha/h
- Average speed between 1.45 and 1.65 km/h
- Comprehensive testing will be continued in the season 2011/12