

Breeding for insect resistance @WUR



WAGENINGEN UR
For quality of life

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Aim

- Insects cause damage through feeding or through transmission of viruses
- Controlled using pesticides
- Aim to reduce use of pesticides

- Resistance in (wild relatives of) crops

Pest insects

- Aphids: *Myzus persicae, Aulacorthum solani, Aphis gossypii*
- *Whiteflies: Bemisia tabaci, Trialeurodes vaporariorum, Aleyrodes proletella*
- Thrips: *Frankliniella occidentalis*, *Thrips tabaci*
- Colorado Potato Beetle: *Leptinotarsa decemlineata*

Tomato, Potato, Pepper, Pumpkin, Squash, Chrysant, Poinsettia

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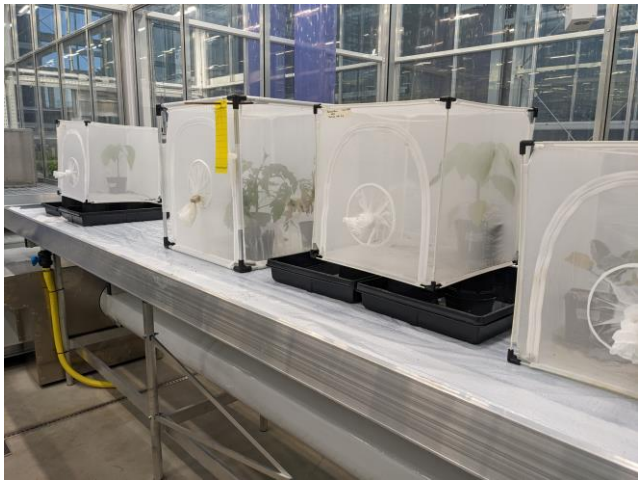
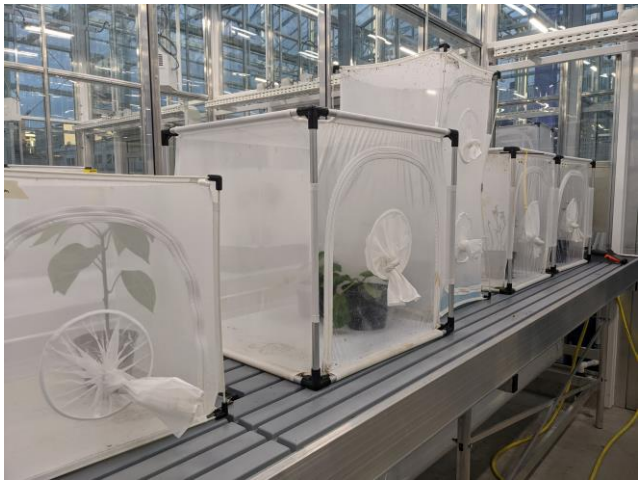
Rearing on hostplant

Different biotypes

Insect rearing





Projects: Public-Private Partnerships

- Most research done in projects
- Funded by Dutch government and companies

Whitefly resistant Poinsettia to reduce insecticide use

Host plants resistance against aphids in Capsicum

Aphid and whitefly resistance in Pumpkin and Squash

Resistance mechanisms against thrips in Chrysanthemum and its relatives

Broad spectrum resistance against insects in potato

Resistance against Colorado Potato beetle for organic market

Projects: Public-Private Partnerships

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- Screening germplasm for resistance against insects
- Developed phenotyping assays for different insects
- Characterization of resistance mechanism
- Genetic analysis (mapping)

Insect resistance sceening

Look for antibiosis type of resistance

Affecting survival and fecundity of the insect

Insect resistance sceening

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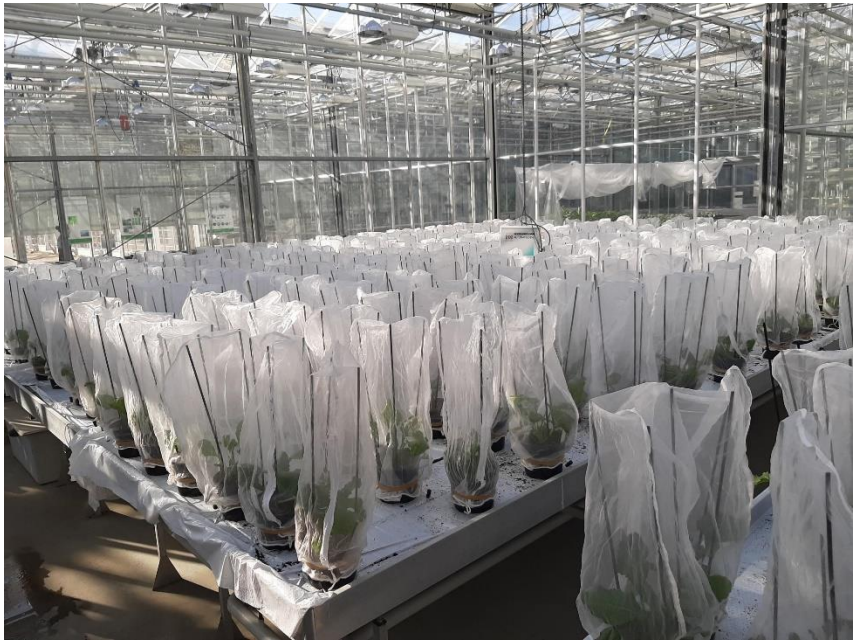
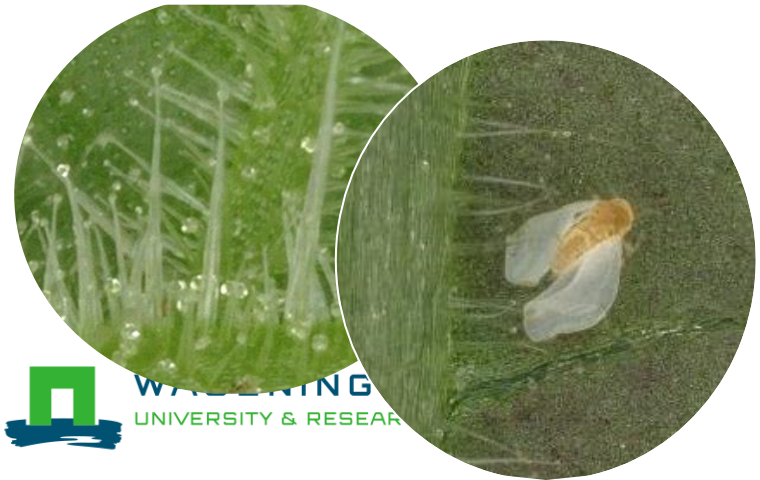


Resistance mechanisms

- Knowledge on mechanism of resistance and genes involved
- Feeding behavior analysis by EPG, video tracking
- Plant staining cellular processes
- Metabolomics
- Trichomes



Mapping of resistance locus: example

Aphid resistance in *Capsicum* maps to a locus containing LRR-RLK gene analogues

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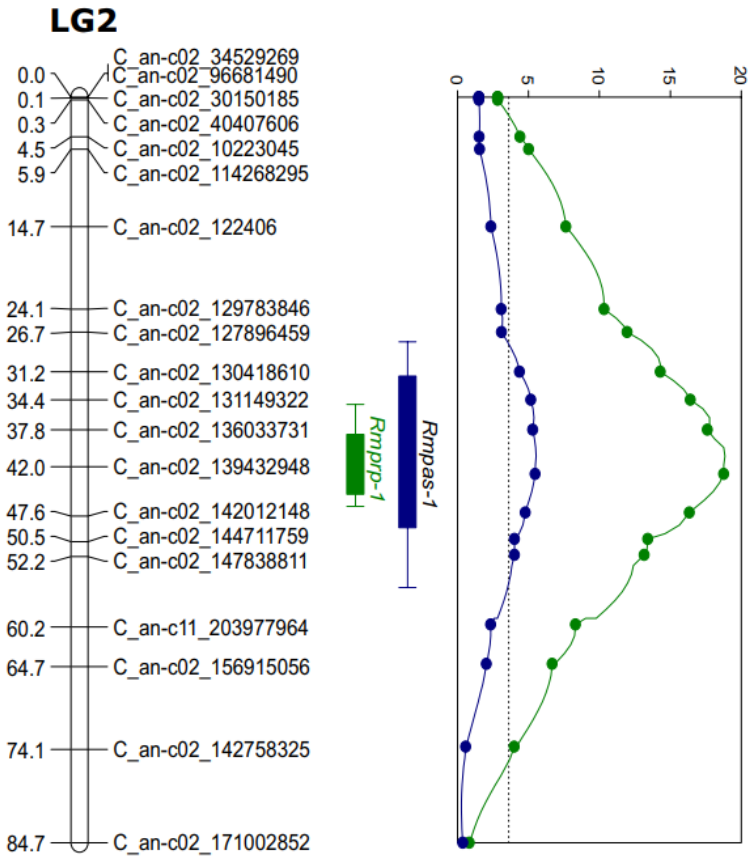

Prospects

- Resistance against multiple insects
- Interaction with biological control
- Automatization of phenotyping