Aphid and virus resistance in potato

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Due to climate change and the restriction of pesticides, aphid populations are growing (Halle et al., 2010). As vectors for viruses, they have a huge impact on plant health. ADLATUS (Adding Layers of Protection to gain a resistant status against *M. chitwoodi*, PLRV, PVY & TRV) is a project consisted of five partners that wants to face the problematic of the tritrophic system consistent of the plant, viruses and their vectors (aphids and nematodes).

In the JKI-Quedlinburg genetic sources for aphid and virus resistances shall be detected. The focus is on *Myzus persicae* and its transmitted viruses Potato Virus Y (PVY, *Potyvirus*, *Potyviridae*) and Potato Leaf Roll Virus (PLRV, *Polerovirus*, *Luteoviridae*). In potatoes, *M. persicae* is described to transmit these viruses in the most efficient way (Halbert et al., 2003; Naga et al., 2020).

The plant material covers a dividing population created by Janine König and several wild accessions, proposed from the Gross Luesewitz Potato Collection of the IPK Genebank.

The phenotypic screening of the plant material with regard on aphid resistance will be done in a two-tier system. A video tracking system is the medium for the first tier of the screening. Afterwards the most interesting genotypes will be tested via a in the entomology common and more detailed technique (Electrical Penetration Graph, EPG).

The infection with the persistant PLRV-virus needs to be done via aphid-transmission, therefore the most efficient *M. persicae* biotype has to be selected from a total amount of 20. The infection with the PVY-virus occurs in a mechanical manner. The infection of the dividing population concentrates on the PVY-Wilga. Whereas the infection of the wild accessions will be done via grafting with five different PVY-strains in regard to find a total resistance.

Genotypic data of the dividing population will be generated via Illumina and its GGP Potato-24 12K Array. Resistance genes shall be detected and diagnostical markers shall be designed.

With our poster we would like to present first results of the establishment of the video tracking method with wild potatoes.