

Wirkung von Transfermulch auf die Übertragung der Kartoffelviren PVY und PLRV durch Blattläuse

Master-Thesis at the Department of Agricultural and Biosystems Engineering

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Abstract

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Potato virus Y (PVY) and potato leafroll virus (PLRV) are important risk factors in seed potato production. Both viruses are predominantly transmitted by aphids as vectors. PVY and PLRV can cause high yield -losses and additionally occur in mixed infections. Since the secondary infection, caused by infected seed potatoes, affects both plants and harvested tubers, to a high degree, the focus is particularly on the cultivation of seed potatoes. But the viruses are also highly relevant for the on-farm cultivation of own seeds. Since no direct control measures are available for the two potato viruses, vector control is an important component in their control. Direct vector control by insecticides is generally problematic due to the mobility of aphids and the different transmission modes of the viruses. Therefore, ways to effectively disrupt host finding behaviour in the field must be considered. The suppressive effect of straw mulch on PVY has already been investigated and may lead to a significant reduction in virus incidence. As an objective of this work, the effect of vetch-triticale as another transfer mulch, on the transmission of both PVY and PLRV will be investigated. The extent to which aphid species occurred as virus-transmitting vectors and the degree of vector pressure was determined. From these data, conclusions will be drawn as to how the cultivation of consumption potatoes and the production of seed potatoes can be effectively protected against the two most relevant viruses in potato cultivation. For this purpose, a field trial was carried out with a vetch-triticale mulch & a control variant. Harvested potato tubers were evaluated for PVY and PLRV incidence by DAS- ELISA. Aphids, captured in yellow pan traps, were counted and determined to species level to describe vector pressure and species composition and biodiversity. The use of vetch-triticale mulch resulted in a 61 % reduction in virus incidence of PVY and 41 % reduction in virus incidence of PLRV in the mulched plots compared to the control plots. The use of the mulch reduced aphid abundance by 33 %. A total of 2029 individuals were captured and assigned to eleven different aphid species. Of these eleven species, six species are known to be viral vectors. The calculated vector pressure was 58 % lower in the mulched area than in the control areas.