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Poster S4-10

Potato virus Y transmitting aphids in a Finnish seed potato area

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The aphid-transmissible *Potato virus Y* (PVY) is a major problem in seed potato production (Valkonen, 2007). Therefore, areas with a low virus infection pressure are preferred, e.g. those in the far north or at high altitudes. An example is the Tyrnävä-Liminka area (64°46′N, 25°38′E) which is one of the five European High Grade Seed Potato Production zones approved by the EU. Also in this area in Finland the prevalence of PVY has shown signs of increase, possibly because aphid populations have thrived under rising temperatures due to climate change and/or because the current PVY strains are more readily transmitted. Because essential information on PVY epidemiology in this area in Finland is lacking, this study aimed to collect data on the species composition and phenology of potential PVY vectors there.

The aphid flight activity was monitored from mid-June to the end of August with a suction trap (ST) and with yellow pan traps (YPT) in 2007 and 2008. YPTs were placed on bare soil at the edge of eight seed potato fields. Vector pressure was calculated in two steps. First, aphid numbers were multiplied by a species-specific relative vector efficiency factor (de Bokx & Piron, 1990). The resulting figures were then totalled for the time of highest virus susceptibility, i.e. from crop emergence to flower opening.

The year 2007 was characterised by an overall low aphid flight activity, with a moderate peak at the end of July and the main peak at the beginning of August. In the early phase of crop development (end of June - middle of July) when plants are most susceptible to PVY, flight activity was low. In 2008, the flight activity was about 5 times higher than in 2007. The YPTs and ST revealed a moderate flight activity peak at the end of June/beginning of July and a second, more pronounced peak at the end of August, mainly caused by *Rhopalosiphum padi* (L.).

A total of 7545 winged aphid individuals was caught in the YPTs, and 644 individuals in the ST. From both trap types 97 different aphid taxa were identified (84 taxa in the YPTs, and 51 in the ST). In both years, *R. padi* was the most dominant species caught by the ST (30.3 % and 56.2 %, respectively) followed by *Metopolophium dirhodum* (Walker) in 2007 (15.2 %) and *Hyalopterus pruni* (Geoffroy) (9.2 %). Although *R. padi* also dominated the YPT catch in 2008 (24.1 %), its presence in 2007 was negligible (1.6 %). *Hayhurstia atriplicis* (L.) was the most dominant species in YPTs in 2007. In both years, *Cryptomyzus galeopsidis* (Kaltenbach) and the *Aphis fabae* Scopoli group showed a relatively high dominance in the YPTs (9.3-13.5 %). No aphids were observed to colonise potato plants. Based on the vector pressure estimations, the most important vector species in 2007 and 2008 were probably *M. dirhodum*, the *A. fabae* group, *C. galeopsidis* and *Hyperomyzus lactucae* (L.). Owing to its high numbers, *R. padi* may also be considered as a PVY vector of potential relevance, despite its late occurrence in the season.

Previous studies have concluded that potato colonising aphids are not the main vectors of PVY (e.g., Boiteau *et al.*, 1988). Since no aphids were observed to colonise potato plants in the Tyrnävä-Liminka area, this must be true also here. Also *Myzus persicae* (Sulzer), which has the highest known propensity to transmit PVY and also an ability to colonise potatoes, was virtually absent from the catch. Instead, non-colonisers like *C. galeopsidis*, *H. lactucae* and *M. dirhodum* could be considered as the main PVY vectors. They occurred in reasonable numbers at potato growth stages when the infected plants are good sources of PVY and susceptible to infection (Valkonen, 2007). Vector efficiency estimations combined with data on the actual increase of PVY incidence in potato crops during the growing season should provide a reasonable way of identifying the aphid species that cause the greatest infection pressure.

Key words: Aphids, Finland, PVY, phenology, vector

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