

Section V.
Pests of Wine Grapes & Small Fruit

Location of the Mechanism of Resistance to the Large Raspberry Aphid, *Amphorophora agathonica*, in Red Raspberry

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The aphid *Amphorophora agathonica* Hottes is an important virus vector in red (*Rubus idaeus* L.) and black (*Rubus occidentalis* L.) raspberries in North America. Host plant resistance in the form of a single dominant gene named *Ag₁* has been relied upon to help control aphid-transmitted plant viruses; however, the mechanism of resistance is poorly understood.

Aphid feeding was monitored using the electrical penetration graph (EPG) technique on a resistant red raspberry 'Tulameen' and compared with a susceptible control, 'Vintage'. There were no differences in feeding behaviors of aphids probing in the epidermis or mesophyll of the leaf tissue. Once in the phloem, aphids feeding on resistant plants spent significantly more time salivating than on susceptible plants, and ingested significantly less phloem sap. This suggests that a mechanism for resistance to *A. agathonica* is located in the phloem.

Reduced ingestion of phloem may result in inefficient acquisition of viruses and is a likely explanation for the lack of aphid-transmitted viruses in plantings of resistant cultivars.

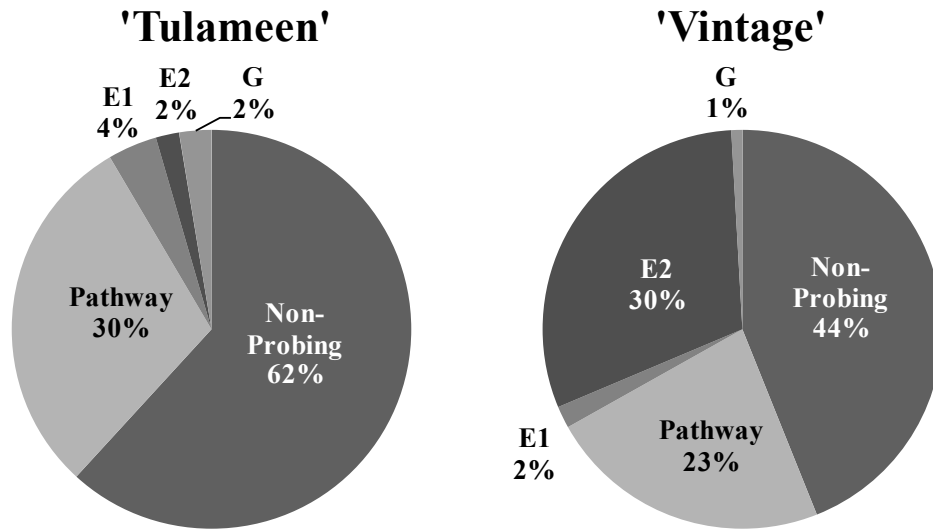


Figure 1. Proportion of time (%) spent performing each feeding behavior by aphids on resistant 'Tulameen' (n=18) and susceptible 'Vintage' (n=17) during 12 h of EPG monitoring. Behavior definition: non-probing – stylets withdrawn from plant; pathway – stylet activities in epidermis & mesophyll including cell punctures; E1 – salivation into phloem sieve elements; E2 – ingestion from phloem sieve elements; G – ingestion from xylem.