

A 1-Page Summary for Granot Avocado Growers (2017)

Behavior of the polyphagous shot hole borer of avocado in regard to inhibitors and attractants

John A. Byers¹, Yonatan Maoz², and Anat Levi-Zada³

¹Faculty of Agriculture, Hebrew University of Jerusalem, Rehovot

²Avocado Growers

³Institute of Plant Protection, Agricultural Research Organization, Volcani Center

The polyphagous shot hole borer (PSHB) is a pest of avocado, *Persea americana* Mill. Quercivorol, a monoterpene alcohol, is known to attract females (males don't fly) over a range of release rates spanning three orders of magnitude. We extend the upper range 10-fold using sticky traps baited with quercivorol released at 1x (0.126 mg/day), 10x, and 108x relative rates to obtain a dose–response curve fitting a kinetic formation function. Naturally infested limbs of living avocado trees were wrapped with netting to exclude the possibility of catching emerging beetles on the encircling sticky traps. The results indicate PSHB are significantly attracted to infested limbs. Ethanol released over a 64-fold range (lowest rate of 7.5 mg/day) was moderately inhibitory of PSHB attraction to 1x quercivorol. β -caryophyllene and eucalyptol did not appear to affect attraction at the rate tested. A field test of potential inhibitors of 1x quercivorol was done using ~1 mg/day releases of monoterpene ketones: (*S*)-verbenone, (*R*)-verbenone, methyl-2-cyclo-hexen-1-one (seudenone), piperitone, (*S*)-carvone, and cryptone. Only the two enantiomers of verbenone and piperitone were strongly inhibitory. A blend of piperitone and (*S*)-verbenone tested together at different distances (0, 0.5, 1, 2, and 4 m) from a 1x quercivorol baited sticky trap became increasingly ineffective in inhibiting the attractant as separation distance increased. Due to the relatively short-range repellency (<1 m), the inhibitors would need to be released from several places on each tree to effectively repel PSHB from avocado trees. EAR and EAR_c are estimated for the quercivorol baits released at 1x, 10x and 108x rates. Push-pull simulations were performed with various combinations of the EAR_c of 10x baited traps with 0, 1, or 3 inhibitors per tree and an initial 10 infested limbs (EAR_c = 0.5m) in a 1 ha plot. The simulations indicate push-pull methods would be more effective than simply using mass-trapping alone.