

Recent Progress in Preventing Black Stem Borer Infestations



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History



2013





***Xylosandrus germanus* – Black Stem Borer**

“Ambrosia Beetle” (Curculionidae: Scolytinae)



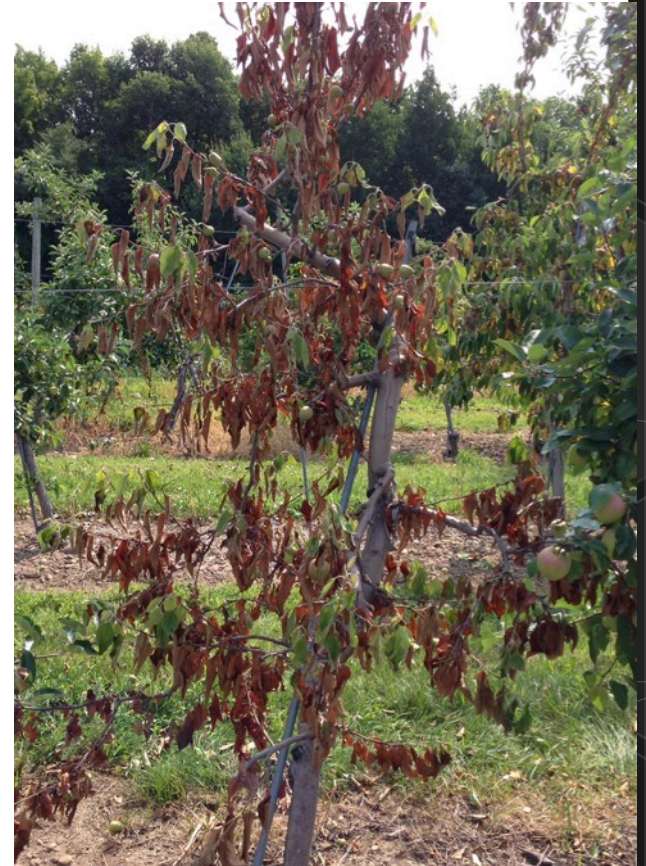
Female drills a hole ~1mm in diameter, and hollows out a channel into heartwood of (usually small) physiologically stressed trees.



larva/pupa in brood chamber

Damage

Discoloration and blistering of bark; compressed sawdust toothpicks visible from adult tunneling. Attack shuts down tree's vascular system: wilting, dieback, death.



Plot Set-Up

- ✧ potted/flooded nursery trees; set directly in adjacent woods
- ✧ individual ethanol lures additionally affixed to each tree
- ✧ trunks treated with candidate products before 1st flight



Summary of Previous Results

- ✧ 2015: sprays of chlorpyrifos (Lorsb)
 - ✧ no measurable infestation impact differences
- ✧ 2016: sprays of chlorpyrifos, pyrethroids, and dispensers (sachets) of verbenone
 - ✧ Verbenone did not improve control alone
- ✧ 2017: directly applied verbenone in combo with methyl salicylate
 - ✧ Verb+MeSa combo was only treatment
- ✧ 2018: different rates of SPLAT Verbenone
 - ✧ 10g/tree rate significantly decreased number of galleries containing adults
 - ✧ Actigard (SAR/systemic acquired silencing) had an effect on number of attacks



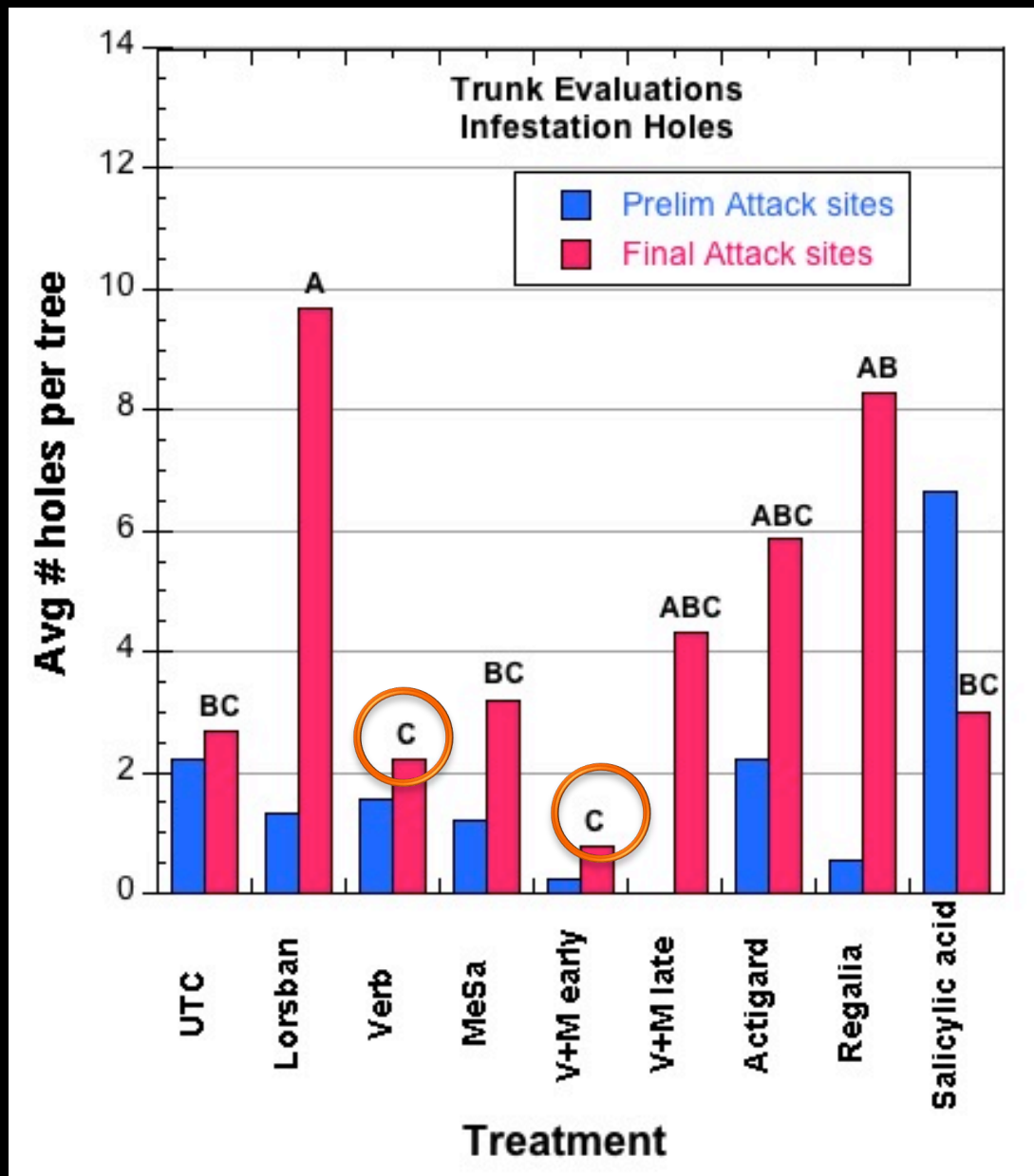
2019 Control Trial – Repellents & Plant Defense/Signalling Compounds

- ❖ SPLAT Verb (verbenone); 10 g/tree dollop, caulking gun; May 15
- ❖ SPLAT MeSa (methyl salicylate); 10 g/tree dollop; May 15
- ❖ SPLAT Verb+MeSa “early”; 10 g/tree, applied May 15 (pre-1st flight)
- ❖ SPLAT Verb+MeSa “late”; 10 g/tree, applied July 9 (pre-2nd flight)
- ❖ Actigard* (SAR, acibenzolar-S-methyl); 0.05 g/liter, Solo backpack
- ❖ Regalia* (SAR, *Reynoutria sachalinensis*); 30 ml/gal, Solo backpack
- ❖ SAR Salicylic Acid*; 8 fl oz/100 gal, Solo backpack
 - ❖ * = applied 3 times (4-week intervals): May 15, June 12, July 9
- ❖ Lorsban (chlorpyrifos); 1.5 qt/100 gal, Solo backpack May 15
- ❖ Untreated Flood-Stressed Check

Treatments evaluated Jul 9 (after 1st flight) & at end of season (Sep 3)

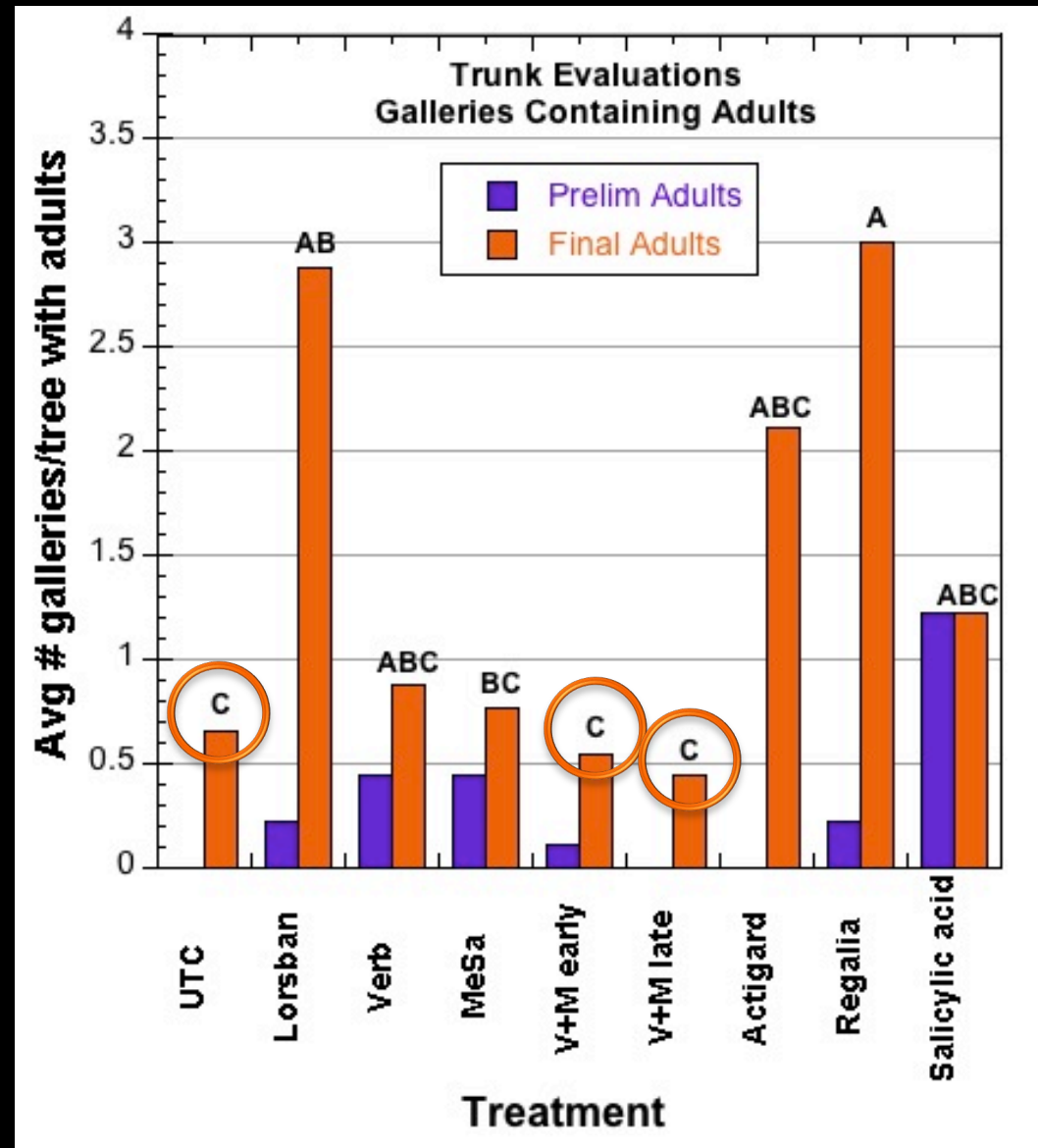
2019 Results – Infestation Holes

- ❖ On final evaluation date (Sept 3), treatments with the fewest infestation sites were the early application of verbenone+methyl salicylate; and verbenone
- ❖ Lorsban had the highest number



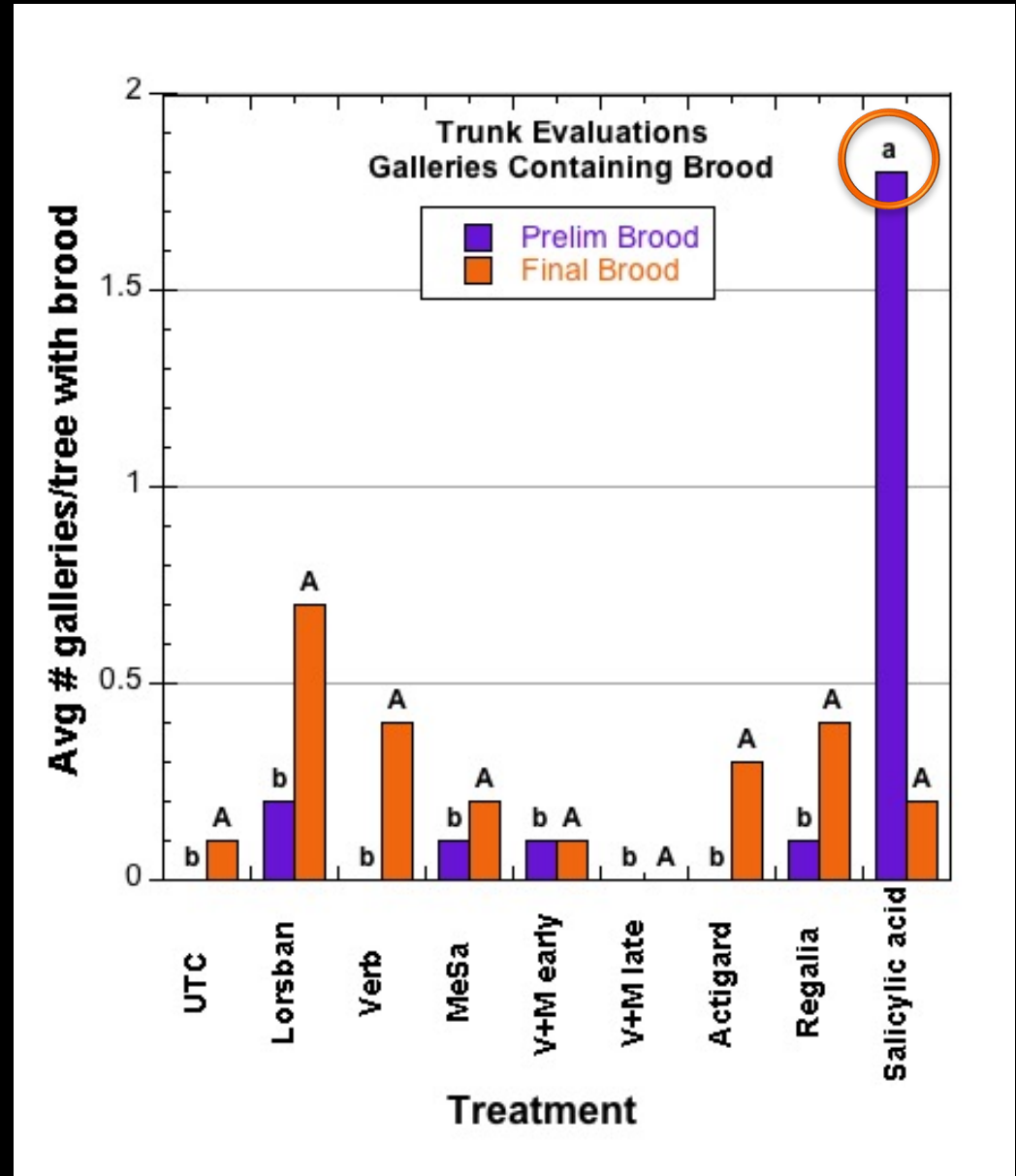
2019 Results – Galleries w/ Adults

- ❖ Fewest number of galleries containing adults were in the verbenone+methyl salicylate (and UTC!) treatments
- ❖ Lorsban and Regalia plots had the highest numbers



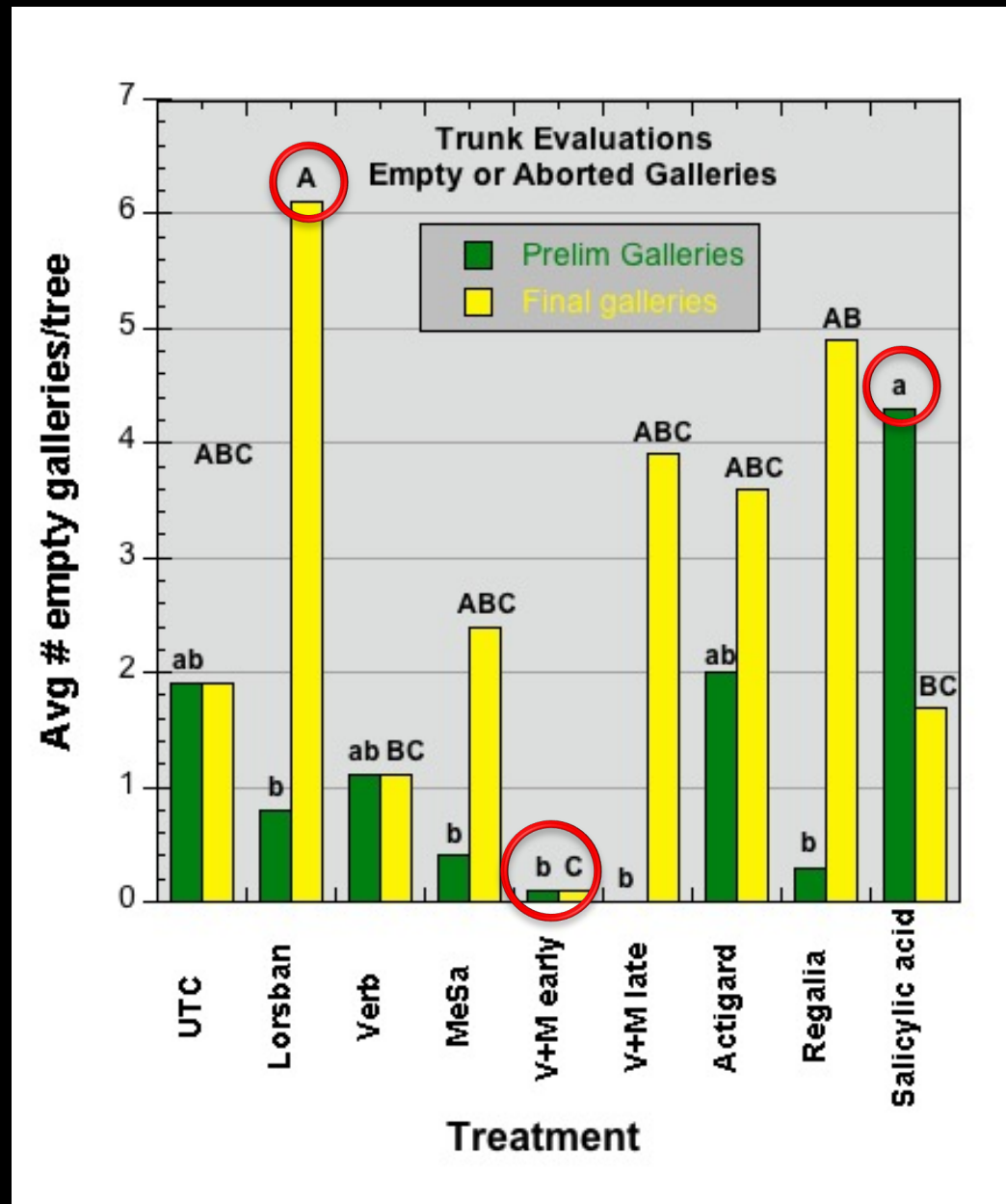
2019 Results – Galleries w/ Brood

- ❖ Brood numbers were uniformly low in all the treatments.
- ❖ The only treatment to break out statistically was the Salicylic acid, but only on the early (July 9) evaluation date.



2019 Results – Empty or Aborted Galleries

- ❖ The fewest numbers were found in the combination verbenone+methyl salicylate early treatment, on both evaluation dates
- ❖ Salicylic acid had the highest number on the July 9 date, and the Lorsban treatment had the highest on the Sept 3 date.



Still formulating recommendations

- ✧ Important to avoid stress to trees
 - ❖ site selection: water & air drainage, irrigation, frost protection
 - ❖ good disease prevention; fire blight, phytophthora
- ✧ Remove and destroy infested trees
- ✧ Ambrosia beetles are difficult to control with insecticides
 - ❖ should be closely timed with beetle attacks (can be monitored with ethanol-baited bottle traps)
 - ❖ best timing likely against emerging OW adults
 - ❖ multiple sprays probably necessary
 - ❖ loss of Lorsban after 2021 season
- ✧ MeSa SPLAT product (ISCA Global): “Beetle Guard”
- ✧ 2020 trials: Field test of commercial formulation

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