SPB Treatments for New Jersey Homeowners

The objective of this study was to evaluate general-use insecticides for effectiveness against New Jersey southern pine beetles (SPB). Four products were evaluated using a series of small-bolt trials: Onyx® (bifenthrin), Astro® (permethrin), Dominion® Tree & Shrub (imidacloprid) and Xytect 2F® (2x imidacloprid). All are labeled for application against bark beetles and none is categorized as Restricted Use in New Jersey. Dominion is a generic of Bayer Advanced Tree & Shrub while the Xytect label allows a 2x application of AI per diameter inch. Both were used as systemics. Loblolly pines were treated in Central Louisiana (average dbh = 4.5 inches) on 14 March 2012 using the maximum label rate of each product. Systemic products were applied as soil drenches, in 1 gallon of tap water, to a raked area around the tree base. Bole sprays were applied to a maximum height of 8 feet. Imidacloprid products suggest a 60 d minimum for product uptake, so treatments were planned to allow SPB challenge beginning in mid to late May 2012. At the appropriate time, trees were felled and bucked to allow challenge of products with SPB using a small-bolt method in field and laboratory trials.

Trial 1 NJ Field (15-20 May 2012)

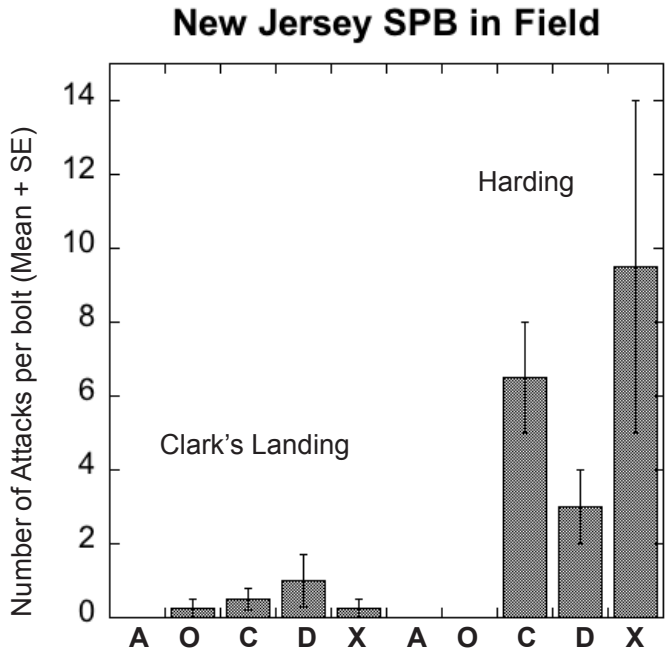


Fig. 1. Deployment of small-bolts for challenge by SPB in field trials ~62 d post-treatment (Atlantic, Co., NJ) (Left). Number of SPB attacks per bolt that resulted from deployment in NJ (Right). We observed 0 attacks to Astro (A) treated bolts and a single Onyx bolt had 1 attack (5 had 0). Pressures from SPB were low, especially at the Clark's Landing site, so additional trials were conducted (see below). C = control, D = Dominion, X = Xytect.

Trial 2 Lab (NJ beetles, 25-27 May 2012)

The low SPB pressures generated in our NJ trapping trial led to a laboratory trial being conducted with SPB from New Jersey (Trial 2) and field trials in Mississippi (Trial 3). Additional trials with SPB and *Ips avulsus* are ongoing.

Laboratory evaluations (Fig. 2) of treatments using NJ beetles provided a robust test (control bolts suitably attacked), demonstrating that SPB from NJ will attack loblolly pine from LA (Fig. 3). In this test, no attacks were observed in bolts previously treated with Astro or Onyx (~72 d after treatment application). Imidacloprid products failed to protect bolts from SPB attack (Fig. 3) or reduce total length of gallery. Treatments indicated as before with the addition of SL, untreated shortleaf pine.

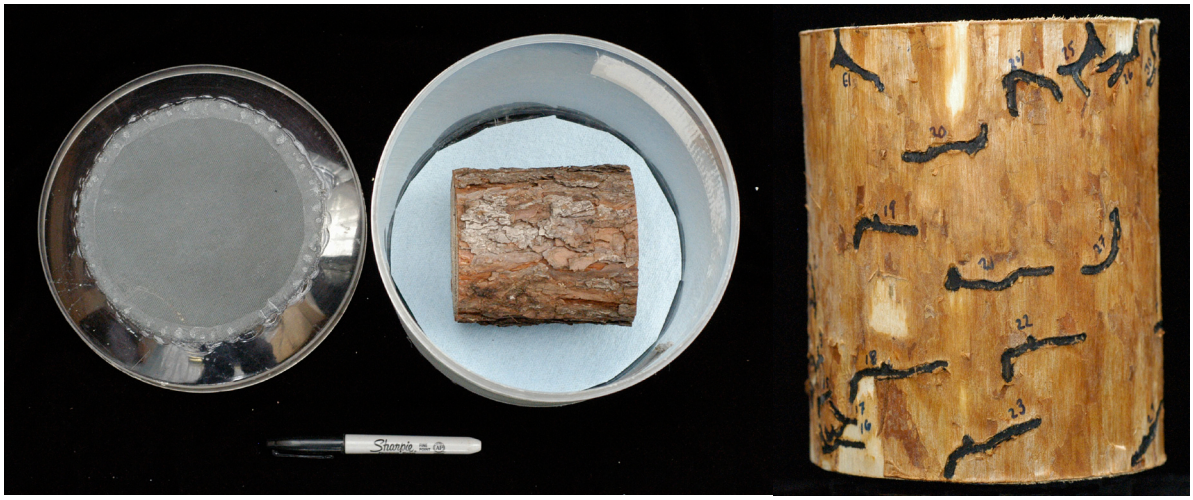
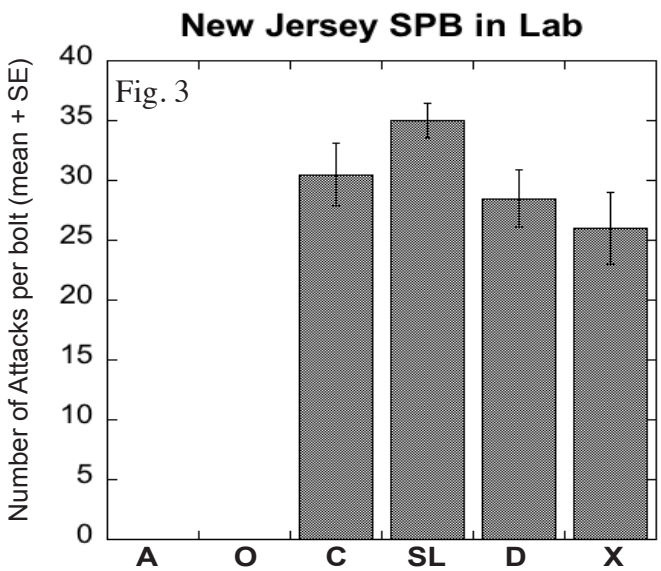


Fig. 2. Challenge of small-bolts in the laboratory was accomplished by enclosing 75 adult SPB with each bolt for 48 h. After bark was removed from bolts, the number of attacks and gallery lengths were recorded.



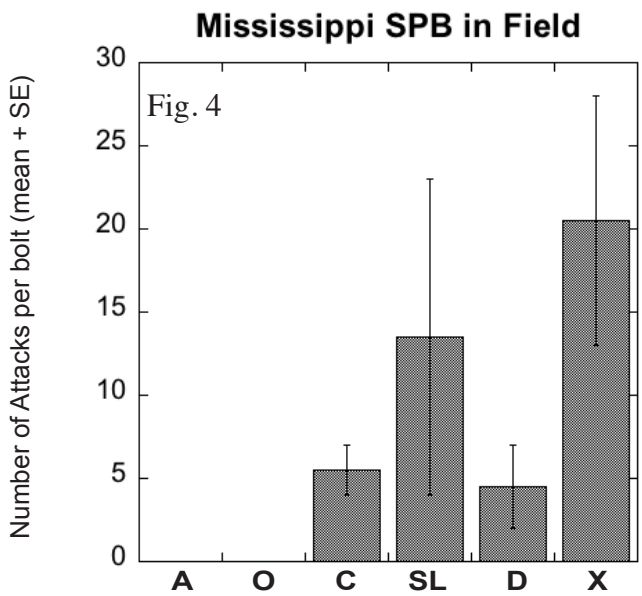


Fig. 3 (Left). SPB from NJ readily attacked untreated loblolly and shortleaf pines from LA. Again the imidacloprid products did not afford protection from attacks or reduce gallery lengths (not shown), while the bole sprays exhibited zero attacks.

Trial 3 MS Field (5-12 June 2012)

Evaluation of treatments (~83 d post-application) against SPB in the field was conducted in MS using the same methods as NJ. The achieved level of challenge (Fig. 4; below left) was less than the lab evaluation but marginally greater than the NJ field test. Results again showed that Astro and Onyx effectively eliminated SPB attacks while the imidacloprid products were ineffective. Additional trials, and the evaluation of phloem tissues for imidacloprid concentrations, are ongoing. Field trials with Astro and Onyx are not planned but may be important if a quantitative estimate of tree protection efficacy is desirable.

Summary

General use insecticides were evaluated as attack preventatives against SPB from New Jersey and Mississippi using a small-bolt assay in the field and lab. Trials were conducted 8 to 10 weeks after treatment of trees. In all trials the imidacloprid products applied as soil drenches (Dominion Tree & Shrub and Xytect) were ineffective, while the bole sprays (Astro and Onyx) were effective for preventing all or most SPB attacks. Until field trials are conducted that result in SPB rigorously challenging treatments applied to standing trees, we recommended using Astro or Onyx applied at their appropriate rate for prophylactic protection of trees from SPB in New Jersey.

Document prepared by B. Strom. Study by B. Strom, J. Meeker, W. Oldland & J. Dunn.