

ETHANOL AND (-)- α -PINENE FOR DETECTING AND MONITORING BARK AND AMBROSIA BEETLES IN THE SOUTHEASTERN USA

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ABSTRACT

Our objective was to verify the need for separate traps baited with ethanol or ethanol and (-)- α -pinene for bark and ambrosia beetles in pine stands of the southeastern U.S. Eight trapping experiments were conducted in stands of mature pine in Alabama, Florida, Georgia, North Carolina, and South Carolina. Sites contained various combinations of the following species of southern pines: *Pinus echinata*, *P. elliottii*, *P. palustris*, *P. strobes*, and *P. taeda*. In each experiment, 32 eight-unit multiple-funnel traps were grouped into 8 replicates of 4 traps per replicate with traps spaced 10 to 15 m within a replicate and replicates spaced 15 to 500 m apart. Each trap was suspended by rope between trees such that the bottom of each trap was 0.2 to 0.5 m above ground. The following treatments were randomly assigned to one of the four traps within each replicate: (1) unbaited control; (2) ethanol; (3) (-)- α -pinene; and (4) ethanol + (-)- α -pinene. The release rates for ethanol and (-)- α -pinene were about 1 to 5 g/day at 23 to 25 °C. Collection cups contained RV antifreeze. Collection periods were as follows: Alabama - April 28 to July 10, 2003; Florida (3 sites) - February 25 to May 25, 2002, February 26 to May 26, 2002, and March 30 to June 16, 2004; Georgia - June 12 to August 8, 2002; North Carolina (2 sites) - June 20 to August 20, 2002, and May 1 to August 14, 2003; and South Carolina - April 15 to July 16, 2003.

Traps baited with ethanol were attractive to 10 species of ambrosia beetles (*Ambrosiodmus tachygraphus*, *Anisandrus sayi*, *Dryoxylon onoharaensum*, *Monarthrum mali*, *Xyleborinus saxesenii*, *Xyleborus affinis*, *X. ferrugineus*, *Xylosandrus compactus*, *X. crassiusculus*, and *X. germanus*) and 2 species of bark beetles (*Cryptocarenum heveae* and *Hypothenemus* spp). Traps baited with (-)- α -pinene were attractive to 5 bark beetle species (*Dendroctonus terebrans*, *Hylastes porculus*, *H. salebrosus*, *H. tenuis*, and *Ips grandicollis*) and 1 platypodid ambrosia beetle species (*Myoplatypus flavicornis*). Ethanol-enhanced responses of 5 species (*Xyleborus pubescens*, *Hylastes porculus*, *H. salebrosus*, *H. tenuis*, and *Pityophthorus cariniceps*) to traps baited with (-)- α -pinene. The latter bait, (-)- α -pinene, interrupted responses of some ambrosia beetle species to traps baited with ethanol. Of 23 species of ambrosia beetles captured in our field trials, 9 were exotic and accounted for 70 to 97 percent of total catches of ambrosia beetles. Our results provide support for the continued use of separate traps baited with ethanol alone and ethanol with (-)- α -pinene to detect and monitor common bark and ambrosia beetles from the southeastern U.S.