

WHITE PINE CONE BEETLE POPULATION TRENDS IN NORTH CAROLINA AND TENNESSEE SEED ORCHARDS 1986 - 1997

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Abstract. Overwintering white pine cone beetle populations in dead cones were sampled from six Eastern white pine seed orchards beginning in 1986 and continuing through 1997. Two sampling schemes were used on each orchard. To collect cones 1. Predetermine 50 sq. ft. plots under individual trees, and 2. Random collections throughout each seed orchard. Generally, beetle populations peaked on the Edwards Seed Orchard in 1992 and 1995 while populations in Tennessee orchards peaked in 1992, 1993, and 1995. In comparison, population peaks were noted on the Beech Creek Orchard in 1988, 1993, and 1997. During the intervening years, populations were moderate or crashed. Very few beetles were found by either sampling technique on the Beech Creek or Edwards Orchards in 1994 while higher populations were discovered in the Tennessee orchards. These data suggest that in Tennessee during 1994, beetle populations were increasing. In 1995, extremely high beetle populations were observed on the Pickett Orchard. There were 76.6 live beetles per 50 sq. ft. sample. This was the largest overwintering beetle population recorded during the survey. In 1996 populations crashed to 0.5 live beetles per plot.

The Pickett Seed Orchard in Tennessee had higher sustained overwintering beetle populations than other surveyed orchards. The Edwards Seed Orchard generally had the fewest overwintering beetles. Comparisons between sampling techniques indicate the 50 sq. ft. method tends to yield trends with less sampling noise making it easier to visually spot population fluctuations. For example, the random sample on the Beech Creek-North Carolina Source in 1997 showed a slight reduction in overwintering populations from the 1996-1997 sample periods, while the 50 sq. ft. sampling method showed a dramatic increase in beetle populations. Cone crop damage by mid-April, 1997 on the Beech Creek-North Carolina source was nearly 100 percent. No cone crop damage data were collected during many of the sample years, thus, we were unable to determine a correlation between cone crop damage and overwintering beetle populations.

Keywords: White pine, white pine cone beetle, seed orchard, *Conophthorus coniperda* (Schwarz), *Pinus strobus* L.