A South-wide Rate Test of Esfenvalerate (Asana® XL) for Cone and Seed Insect Control in Southern Pine Seed Orchards

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As many as five monthly applications may be required each year to protect southern pine seed orchards from coneworms, *Dioryctria* spp. Insecticides targeted to control coneworms usually provide control of two other pests, the leaffooted pine seed bug, *Leptoglossus corculus*, and the shieldbacked pine seed bug, *Tetyra bipunctata*. Esfenvalerate (Asana® XL) is a pyrethroid insecticide that is effective for both coneworms and seed bugs. Aerial application of the maximum labeled rate of esfenvalerate can cause outbreaks of secondary pests such as scale insects and mealy bugs. These secondary insect outbreaks promote growth of unsightly sooty mold and reduce tree vigor and growth.

Previous ground-application studies indicate that seed bugs can be controlled with much lower levels of esfenvalerate than the maximum labeled rate. If it can be demonstrated that these reduced rates are also effective against coneworms, the amount of pesticide used may be reduced. This will make management more economical while not promoting the buildup of secondary insects.
A South-wide study was conducted to operationally evaluate the efficacy of reduced rates of esfenvalerate. Six orchards throughout the South were used in the study, five loblolly pine orchards and one slash pine orchard. Each orchard had four treatment plots. A complete block design was used with each orchard serving as a replicate. The four study treatments were: Asana® XL at the labeled rate of 0.19 pounds active ingredient/acre (ai/ac), Asana® XL at 0.10 pounds ai/ac, Asana® XL 0.03 pounds ai/ac, and a control consisting of untreated trees. Aerial applications were made five times at monthly intervals (May-August). Efficacy data collected were crop survival, yields of healthy and damaged cones, and seed yield. Each treatment was surveyed for secondary insects the following year.

All rates of esfenvalerate were effective in controlling seed bugs. First-year conelet survival, and percent good seed were significantly lower for the control when compared against the 0.03, 0.10 and 0.19 pound ai/ac application rates. The composite trait, good-seed per original-flower, gave the same results. However, the lower rates did not protect against coneworm damage. For the five loblolly pine seed orchards, coneworm damage at the 0.19 pound ai/ac was significantly lower than for the control or the two reduced rates. The two low rates did not result in secondary insect outbreaks.

The resulting management recommendation is that reduced rates of esfenvalerate may be applied only in combination with insecticides specific to coneworms, such as the growth regulator tebufenozide. This allows an optimal combination of efficacy with minimal use of pesticide and reduced risk of secondary outbreaks.