

## THRIPS MANAGEMENT AND ISSUES IN TEXAS

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### Abstract

Thrips are the most consistent and often the most damaging insect pest in Texas cotton with as much as 100% of acres being infested, with 50% or more of the acres being treated preventively and 20% or more receiving foliar insecticide applications (Williams 2009, 2010, 2011, In press). The thrips species complex in cotton changes greatly from west to east. West Texas cotton is dominated by western flower thrips, *Frankliniella occidentalis* and onion thrips, *Thrips tabaci* (Albeldano et al. 2008, Reed et al. 2010, Akin et al. 2011). Eastwardly, western flower thrips becomes less dominant and although still present in low numbers, is largely replaced by tobacco thrips, *Frankliniella fusca* and flower thrips, *Frankliniella tritici*. The gulf coast region of Texas has the most diverse thrips population in Texas cotton (Parker, personal communication).

Species composition is important when considering insecticide selection. Some species are more easily controlled with insecticides than others. Along the gulf coast of Texas where the thrips population is primarily composed of tobacco thrips, flower thrips and onion thrips, all of the neonicotinoid seed treatments will usually persist long enough to offer full early-season protection from thrips (though the 4 true leaf stage) (Parker et al. 2009, 2010). However, there are instances in this region where imidacloprid lacks sufficient persistence. In the Texas High Plains in areas where the thrips population is primarily composed of western flower thrips, seed treatments rarely provide long enough control. Imidacloprid, marketed as Gaucho Grande 600 or generics, typically lasts only 7 days post crop emergence, while thiamethoxam (Crusier, Avicta Complete Cotton) will provide 14-18 days of post emergence control (Vandiver et al. 2009). Interestingly, Aeris, which contains the insecticide imidacloprid and the nematocide thiodicarb, provides 14-18 days of post emergence control of western flower thrips (Vandiver et al. 2009). Thiodicarb is quickly metabolized in the soil to methomyl, the active ingredient in Lannate which is systemic as a soil treatment and does provide some protection from thrips (Vandiver et al. 2009, Kerns and Kesey In press). Aldicarb, marketed as Temik or Meymik, are granular insecticides that are used in-furrow. Temik is considered the standard and currently the best treatment for western flower thrips. At a rate of 3.5 lbs-product/acre, it will typically provide 21-24 days control (Vandiver et al. 2009, Nino and Kerns 2010). When preventative treatments lose efficacy, it's important that foliar insecticide sprays be utilized if the thrips population persists. In the Texas High Plains when onion thrips are the dominant species, all of the seed treatments as well as Temik usually provide sufficiently long enough control that foliar sprays are usually not required (Akin et al. 2010, Kerns and Kesey 2011).

The efficacy of preventive treatments can be influenced not only by the species of thrips present, but also by soil moisture (Kerns et al. In press). Efficacy of Temik can be lessened or residually shortened by excess or inadequate moisture. Temik requires adequate soil to make it available to the plant and move it into the root zone, but not so much as to leach it out of the root zone. As one might expect, soil texture will influence this relationship. Seed treatments appear to benefit from moderate to high moisture, especially those that are more soil mobile such as thiamethoxam and the thiodicarb metabolites. Similar to Temik, the moisture helps move the insecticide off the seed coat and into the root zone. Imidacloprid is less soil mobile and less affected by moisture; this may be the primary reason why imidacloprid is less effective as a seed treatment than thiamethoxam.

The currently thrips action threshold in Texas is 1 thrips per plant at the cotyledon to 1 true leaf stage, 2 thrips per plant at the 2 true leaf stage, 3 thrips per plant at the 3 true leaf stage and 4 thrips per plant at the 4 true leaf stage (Anonymous 2011). This threshold appears sufficient under good growing conditions, however, under sub-optimal conditions, such as cool weather where plant growth is inhibited, this threshold appears to be too high and may need to be halved (Kerns et al. 2011A). When conditions are cool, it is not uncommon for cotton to suffer as much as a 25% reduction in lint yield (Vandiver et al. 2009, Kerns et al. 2011). The net return for protecting cotton from thrips under cool conditions may exceed \$200 per acre. The Texas action threshold for thrips is dynamic, changing according to the plant's stage of growth. Data suggests that controlling thrips is most critical during the first 2 weeks post emergence (Kerns et al. 2011A, Roberts et al. In press). Additionally, one should not base treatment decisions on plant damage, but rather on thrips numbers and colonization.

Seed treatments are limited by the amount of active ingredient that can be placed on the seed coat. As an alternative to aldicarb, there is much interest in finding insecticides or application techniques that offer lengthy thrips control similar to aldicarb. At present, there is much investigation taking place in regard to in-furrow sprays of the same active ingredients used as seed treatments, including: imidacloprid, thiamethoxam and thiodicarb. Early tests suggest that these in-furrow sprays may be viable alternatives (Kerns and Kesey In press).

It's important to be cognizant of all early-season pests and the interactions among them. Thrips feeding results in reduced leaf surface area, growth, and root growth (Roberts et al. In press). Nematodes reduce root growth and production also. Both of these factors may compound each other. Additionally, it has been demonstrated that thrips feeding influences the impact of seedling diseases such as *Rhizoctonia solani*, and the ability of fungicides to protect from seedling disease (Kerns et al. 2011B). Where thrips were not effectively controlled, especially during the first 2 weeks post emergence, there was no benefit from utilizing a premium fungicide treatment and stand loss was similar to where only base fungicide was used. However, where the cotton was adequately protected from thrips, the crop's stand was maintained.

Thrips continue to be a persistent and damaging pest of Texas cotton. Managing thrips depends on the species involved, optimal timing of protection measures, and the insecticides used. It's important to know which species of thrips is most common for an area. Western flower thrips tend to be more difficult to control than other commonly encountered species.

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