TWOSPOTTED SPIDER MITE MANAGEMENT IN TEXAS AND MIDSOUTH COTTON

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Abstract

Studies were conducted across the Midsouth and Texas evaluating foliar miticide treatments against twospotted spider mites, *Tetranychus urticae* (Koch), infesting cotton. Three out of nine locations experienced low to moderate twospotted spider mite (TSSM) pressure in 2021. Dedicated miticides Stifle, Portal, Agri-Mek and combinations containing the aforementioned miticides provided the greatest control of TSSM across all locations and timings. Liberty 280 SL, a broad-spectrum herbicide, did not significantly reduce populations of mites 4 and 7 DAA at the Arkansas location but did at the Texas and Tennessee location. Our data delineates the efficacy of several miticides across varying geographies and cotton production systems. These data will be important for improving our IPM recommendations for TSSM in cotton.

Introduction

The TSSM status as an economic pest in Midsouth cotton has changed over the last 10 years. Historically, spider mites have been considered a late-season pest in the Midsouth with pesticide applications often rarely needed during early reproductive stages of cotton development (Gore et al. 2013). However, spider mites have become an increasing problem in recent years in the Midsouth (Gore et al. 2013). Numerous factors such as the use of broad-spectrum insecticides for control of other economically important pests, and inadequate or poor fall and spring vegetation management may have contributed to the increase in spider mites becoming a season-long pest in Midsouth cotton production systems. The use of broad-spectrum insecticides for insects such as tarnished plant bug *Lygus lineolaris*

(Palisot de Beauvois) and bollworm *Helicoverpa zea* are often required to minimize economic losses. Due to widespread insecticide resistance among these pests, the practice of tank mixing organophosphates and neonicotinoids with pyrethroid insecticides is common among many producers throughout the Midsouth. These applications disrupt beneficial arthropod populations creating an optimal environment for the proliferation of secondary pests such as TSSM (Gore et al. 2013). Additionally, poor or inadequate fall and spring vegetation management may contribute to seasonal infestations of TSSM. TSSM have a documented host range of over 900 plant species with many of these species occurring in and around agricultural production fields in the Midsouth (Kavousi et al.2009, Smith et al. 2013). Once these alternative hosts begin to terminate by either herbicide applications or natural senescence, spider mites will crawl to the tops of the plants to be dispersed by wind or migrate to adjacent crop hosts.

Materials and Methods

Miticides used for control of spider mites were evaluated using a common treatment list and sampling protocol across the Mid-South and Texas. The treatment list included material and rate combinations that are typically used for TSSM control in the cotton growing regions (Table 1). Miticides were applied to plots of cotton infested with moderate densities of spider mites at three locations: Northeast Research & Extension Center (Keiser, Arkansas), College Station, Texas, West Tennessee Research and Education Center (Jackson, Tennessee). Experiments were arranged as randomized complete block designs with four replicate blocks, and plots were four rows wide by approximately 30 to 50 feet in length. Some plots were sampled prior to application and again at 4 and 7 DAA. At each sampling date, ten leaves from the top five nodes were randomly sampled from the middle two rows of each plot. All motile mite life stages were counted using a 1 in^2 magnified hand lens placed on the abaxial side at the leaf base. Total motile mites by location were pooled for analysis.

Results

Foliar trial results indicated satisfactory control of TSSM across all products at the Texas location (Figure 1). Stifle alone and combinations of Portal + Brigade and Agri-Mek + Stifle were the only treatments to significantly reduce TSSM numbers, compared to the non-treated, at the 4, 7 DAA rating at the Arkansas location (Figure 2). All treatments at the Tennessee location significantly reduced TSSM numbers compared to the non-treated (Figure 3). Overall, treatments containing Stifle, Portal alone or in combinations with other insecticides/miticides provided the greatest level of TSSM control across locations. The addition of Agri-Mek to Stifle, at reduced rates, provided excellent of TSSM control at the Arkansas location (Figure 2). The addition of Exponent to Portal provided no additional benefit when compared to Portal alone at the Tennessee and Texas locations (Figure 1, 3). Experiments were terminated at each location when TSSM populations rapidly declined.

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Table 1. Standardized treatment list for 2021 TSSM trials.

Treatment	Rate
Non-treated	-
Agri-Mek 0.7 SC	2.5 fl oz/acre
Portal 0.4 EC	16.0 fl oz/acre
Oberon 4.0 SC	4.0 fl oz/acre
Athena	10.0 fl oz/acre
Liberty 280 SL	32.0 fl oz/acre
Denim	8.0 fl oz/acre
Stifle 2.88 SC	2.0 fl oz/acre
Portal 0.4 EC + Brigade 2 EC	10.0 + 6.4 fl oz/acre
Portal 0.4 EC + Exponent	16.0 + 8.0 fl oz/acre
Agri-Mek 0.7 SC + Stifle 2.8 SC	1.75 + 1.0 fl oz/acre

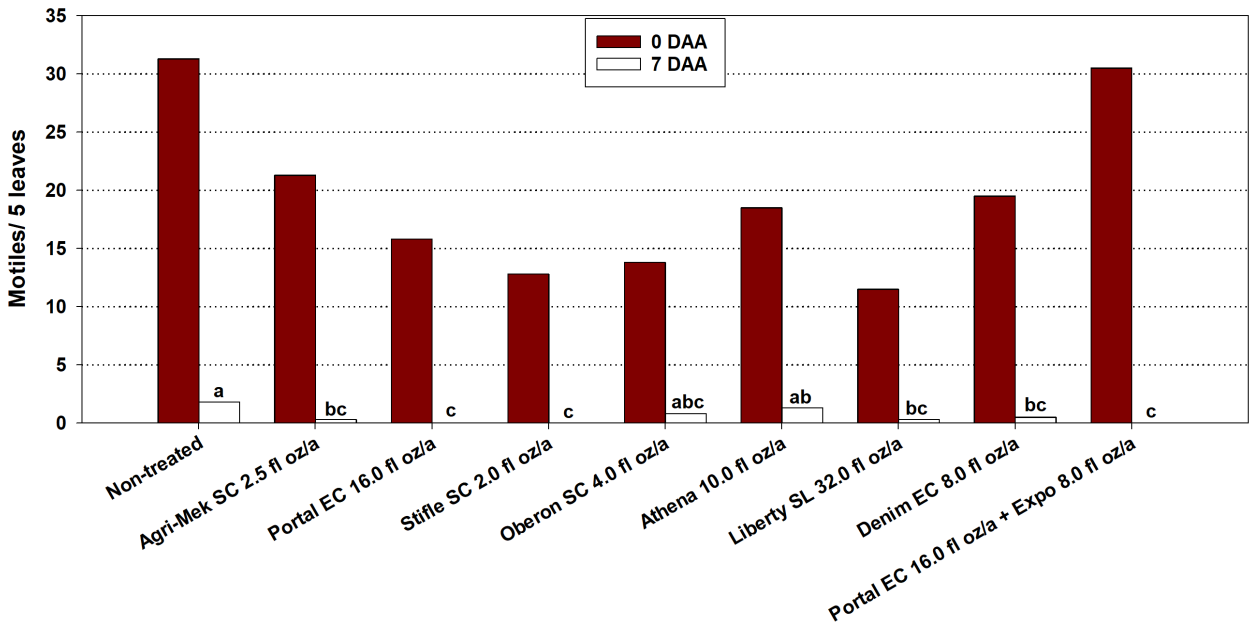

Figure 1. TSSM treatment results 0, 7 DAA at the College Station, Texas location.

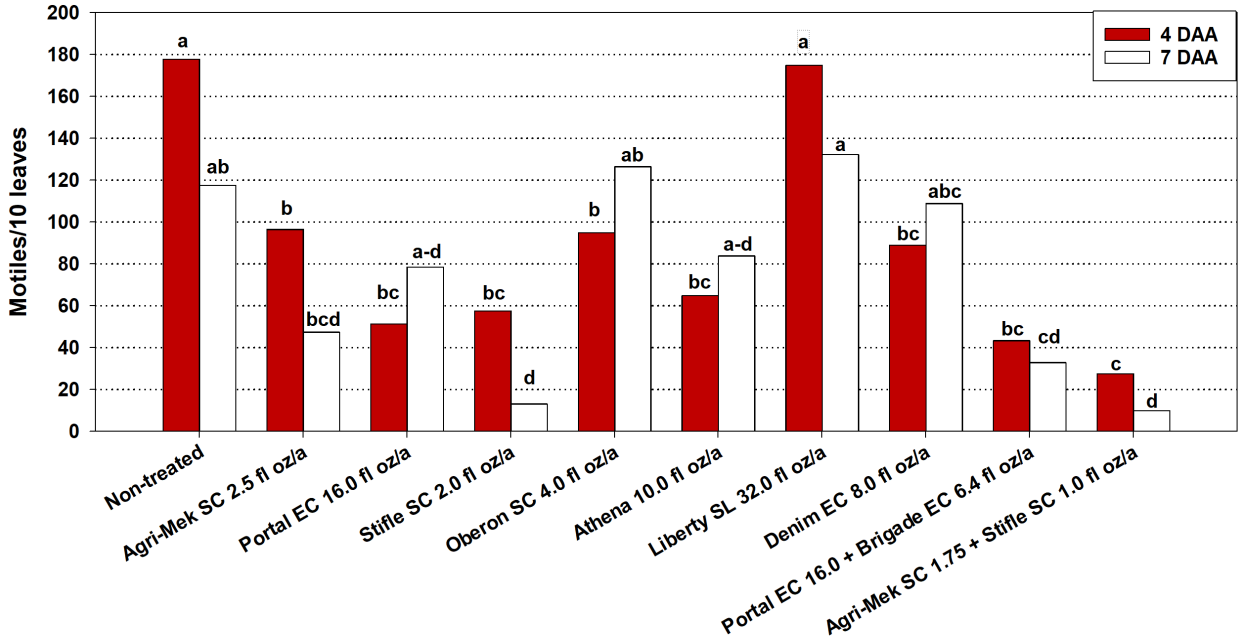

Figure 2. TSSM treatment results 4, 7 DAA at the Keiser, Arkansas location.

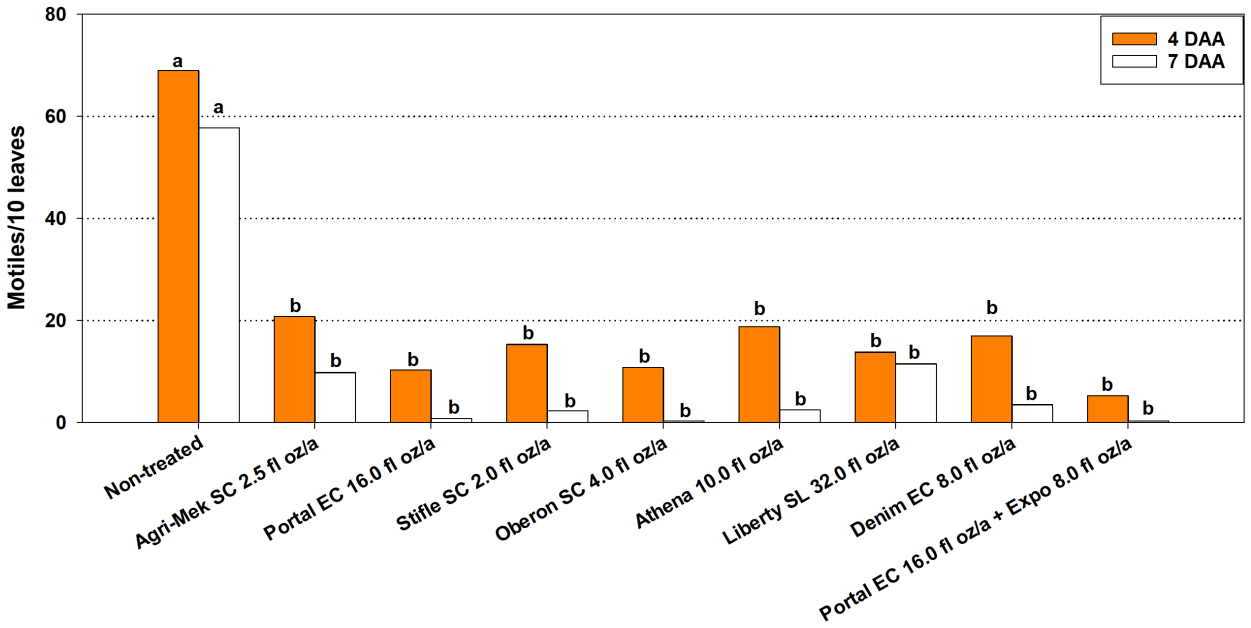

Figure 3. TSSM treatment results 4, 7 DAA at the Jackson, Tennessee location.