EFFICACY OF INSECTICIDE SEED TREATMENTS FOR CONTROL OF RICE WATER WEEVILS AND GRAPE COLASPIS BY PLADING DATE

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Abstract

Trials were conducted in 2015 and 2016 at the Rice Research and Extension Center, Stuttgart, Arkansas, to evaluate the efficacy of insecticide seed treatments across a range of planting dates to determine if there were times when insecticide seed treatments had more or less value than others. Results from both years indicate that regardless of planting date, insecticide seed treatments provide protection from insect pests and result in a yield increase.

Introduction

An important pest in Arkansas rice fields is the grape colaspis (GC) also known as the lespedeza worm. Larvae eat away at the rice stem and roots causing a "girdling" effect, which causes the plant to yellow and become stunted and, in many cases, can cause significant stand reduction (Lorenz et al., 2006). Thin stands caused by GC often result in increased rice water weevil (RWW) infestations which are attracted to areas in the field with a thin stand. Fields most likely to sustain injury from grape colaspis are those that were planted in corn or soybeans the previous year (Thomas et al., 2009).

RWW's are estimated to be present in more than 90% of the rice fields throughout the southern states every year (Gianessi et al., 2009). The RWW adults fly into fields in early spring when fields are flooded and begin feeding on rice leaves. This feeding is characterized by long linear scars which is a good indicator of RWW infestation but does not result in any significant damage or yield loss. Once the field has been flooded the female RWW swims from plant to plant and deposits eggs in the leaf sheaths below the water surface. The larval stage is considered the damaging stage of the RWW (Lorenz et al., 2006). When the rice root system is damaged by larval feeding, the plant's uptake of nutrients is reduced and nutrient deficiency symptoms may occur (Bernhardt et al., 2001). Severely damaged plants become yellow and stunted and may have delayed maturity resulting in a stand loss and yield reduction. Trials were conducted in 2015 and 2016 at the Rice Research and Extension Center, Stuttgart, Arkansas, to evaluate the efficacy of insecticide seed treatments (IST) across a range of planting dates to determine if there were times when insecticide seed treatments had more or less value than others.

Materials and Methods

Plot size was 6-ft by 15-ft, in a randomized complete block design with four replications. Treatments consisted of: CruiserMaxx Rice (thiamethoxam) at 7 oz/cwt; Dermacor X-100 (chlorantraniliprole) at 2.5 oz/cwt; NipsIt Inside

(clothianidin) at 1.92 oz/cwt; and an untreated check (UTC). All treatments, including the UTC, were treated with a base fungicide package of Apron 0.365 oz/cwt, Maxim 0.046 oz/cwt, and Dynasty 1 oz/cwt. Six tests were planted approximately 2 weeks apart from early-April to mid-June in 2015; and from late-March to early-June in 2016.

Grape colaspis and rice water weevil larvae were evaluated by taking 3 core samples per plot with a 4-inch cylinder core sampler. Grape colaspis samples were collected 21 to 28 days post emergence and cores were examined on site for presence of larvae. RWW samples were collected ~21 days post flood and processed at the Lonoke Extension and Applied Research Center using a wash technique to remove all larvae from the soil and roots using a 40- gauge mesh sieve. After washing, samples were then placed in a salt solution to allow larvae to float to the top for an accurate count. Data was processed using Agriculture Research Manager, Version 9 (Gylling Data Management, Inc., Brookings, S.D.). Analysis of variance was conducted and Duncan's New Multiple Range Test (P=0.10) to separate means.

Results and Discussion

2015

Core samples for GC had very low numbers except for the 2nd planting date (March 21). NipsIt Inside had fewer GC larvae compared to the untreated check but was similar to CruiserMaxx (Fig. 1). All insecticide seed treatments (ISTs) had less RWW larvae compared to the UTC across all planting dates (Fig. 2 and 3). On the first planning date (June 12), Dermacor had fewer weevils compared to CruiserMaxx. Dermacor provided better control than CruiserMaxx and NipsIt Inside on the 2nd planting date (June 25). On the 6th planning date, all ISTs provided better control of RWW than the UTC; Dermacor had fewer RWW than NipsIt Inside and CruiserMaxx. On 3 of 6 planting dates, IST's provided a yield increase over the UTC but a trend was obvious across all dates (Fig. 4).

2016

No GCs were found in core samples and no damage was observed. All ISTs had fewer RWW than the UTC at every planting date (Fig. 5). In later planting dates, less RWW were observed in Dermacor plots, with a trend for better control across all planting dates. A trend in yield increase was observed when using an IST (Fig. 6).

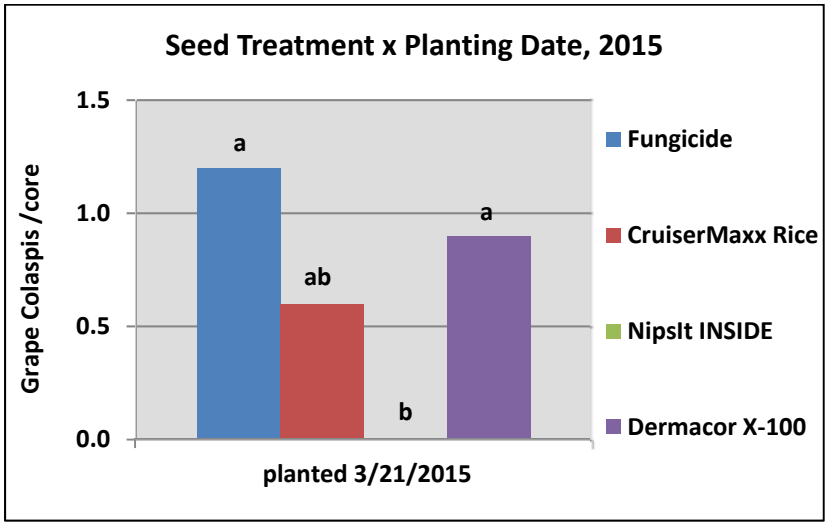

Figure 1: 2015 Grape Colaspis per core, 2nd planting date.

Data was processed using Agriculture Research Manager, Version 9 (Gylling Data Management, Inc., Brookings, S.D.). Analysis of variance was conducted and Duncan's New Multiple Range Test (P=0.10) to separate means.

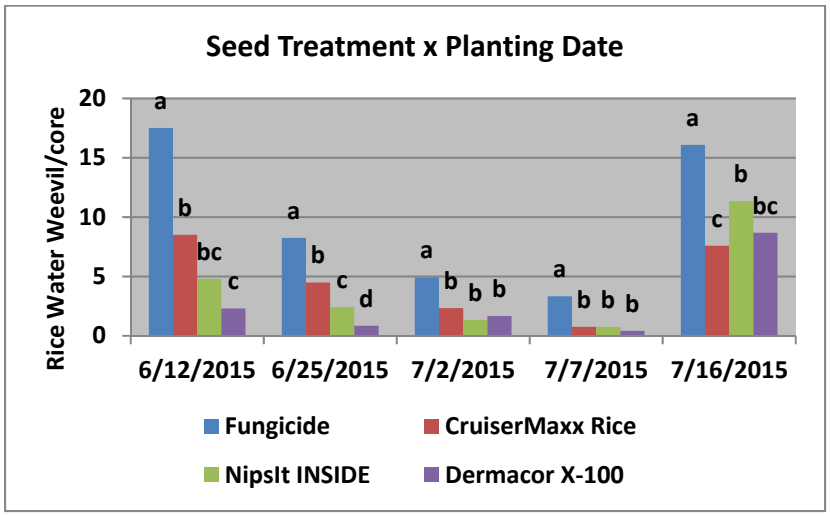

Figure 2: 2015 Rice Water Weevil per core, 1st through 5th planting date.

Data was processed using Agriculture Research Manager, Version 9 (Gylling Data Management, Inc., Brookings, S.D.). Analysis of variance was conducted and Duncan's New Multiple Range Test (P=0.10) to separate means.

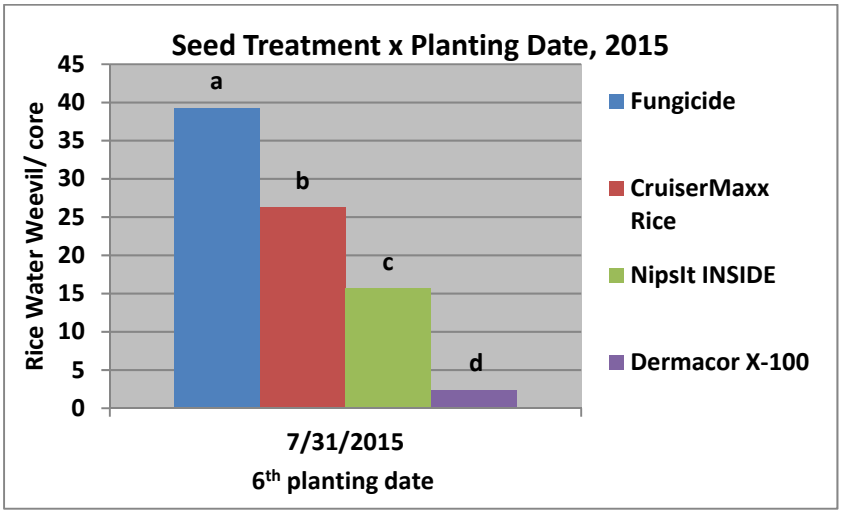

Figure 3: 2015 Rice Water Weevils per core, 6th planting date.

Data was processed using Agriculture Research Manager, Version 9 (Gylling Data Management, Inc., Brookings, S.D.). Analysis of variance was conducted and Duncan's New Multiple Range Test (P=0.10) to separate means.

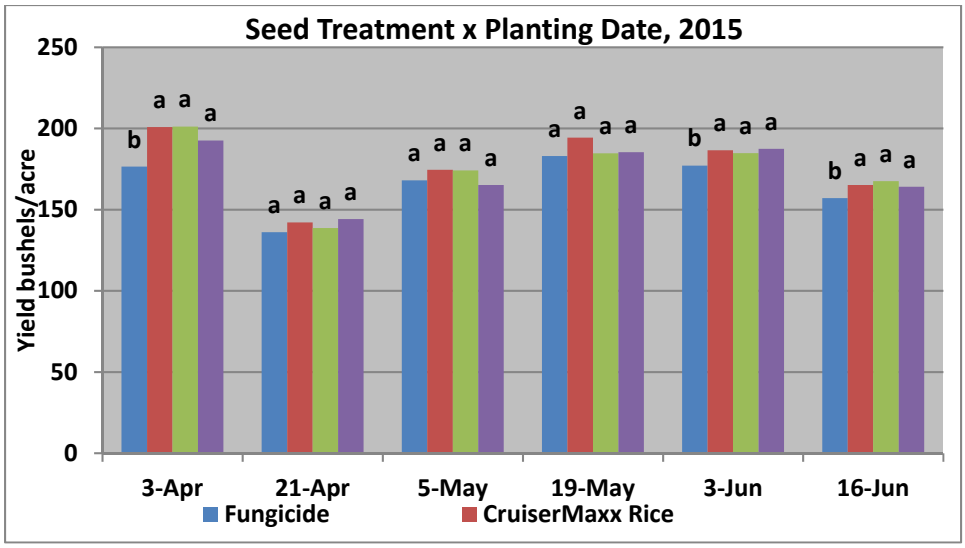

Figure 4: 2015 Yields, Seed Treatment by Planting Date.

Data was processed using Agriculture Research Manager, Version 9 (Gylling Data Management, Inc., Brookings, S.D.). Analysis of variance was conducted and Duncan's New Multiple Range Test (P=0.10) to separate means.

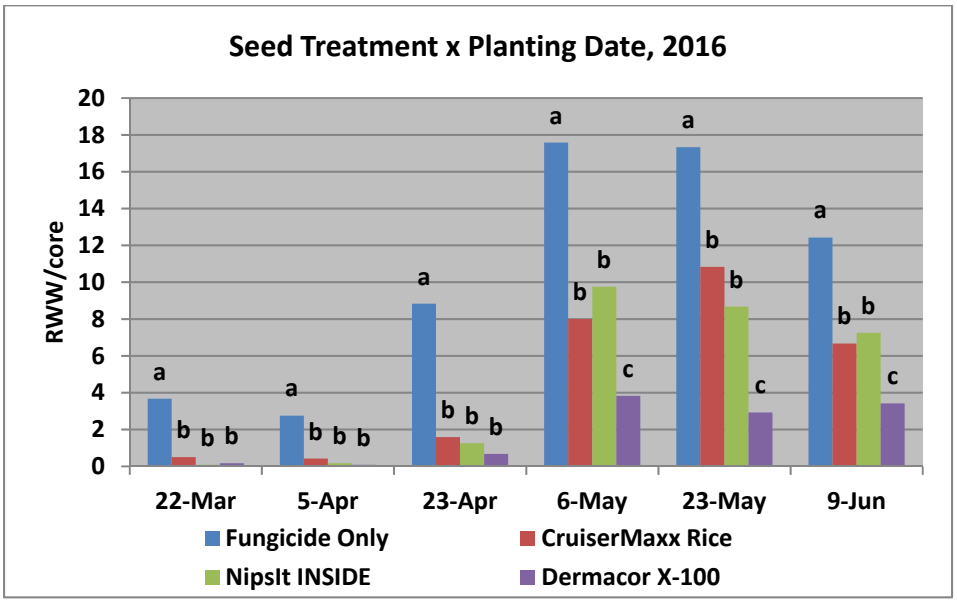

Figure 5: 2016 Rice Water Weevil per core, Seed Treatment by Planting Date.

Data was processed using Agriculture Research Manager, Version 9 (Gylling Data Management, Inc., Brookings, S.D.). Analysis of variance was conducted and Duncan's New Multiple Range Test (P=0.10) to separate means.

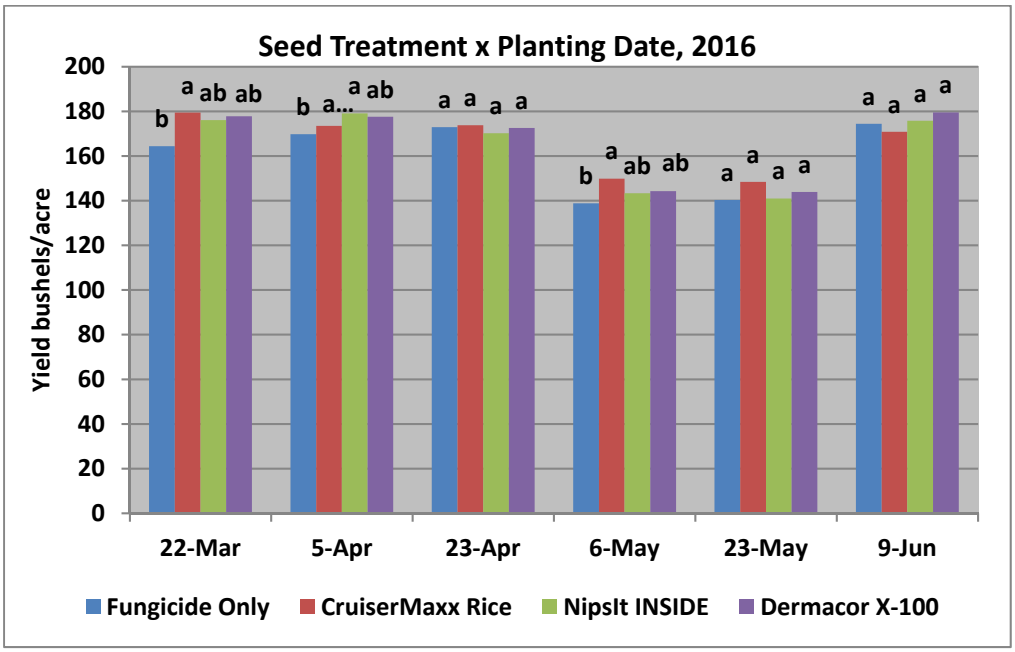

Figure 6: 2016 Yield, Seed Treatment by Planting Date.

Data was processed using Agriculture Research Manager, Version 9 (Gylling Data Management, Inc., Brookings, S.D.). Analysis of variance was conducted and Duncan's New Multiple Range Test (P=0.10) to separate means.

Summary

This study indicates that, regardless of planting date, yields tend to increase with an insecticide seed treatment and that Dermacor tends to give better control of RSB.

Acknowledgements

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