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Shrishail S. Navi

Iowa State University, ssnavi@iastate.edu

Xiao-Bing Yang

Iowa State University, xbyang@iastate.edu

Kenneth T. Pecinovsky

Iowa State University, kennethp@iastate.edu

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Efficacy Results of Fungicides on Soybean White Mold Control

Abstract

Soybean white mold has been a production problem for soybean producers since the early 1990s. Iowa's cool, wet summer has increased the white mold risk for some growers in Iowa. Sclerotia (in the soil) germinate and produce apothecia, and apothecia produce ascospores. These spores attack soybean plants at flowering. Therefore, treatment to protect soybean has to be made before or during the flowering period, depending on chemicals used.

Keywords

RFR A9034, Plant Pathology

Disciplines

Agricultural Science | Agriculture | Plant Pathology

Efficacy Results of Fungicides on Soybean White Mold Control

RFR-A9034

Shrishail S. Navi, assistant scientist
X.B. Yang, professor
Department of Plant Pathology
Ken Pecinovsky, farm superintendent

Introduction

Soybean white mold has been a production problem for soybean producers since the early 1990s. Iowa's cool, wet summer has increased the white mold risk for some growers in Iowa. *Sclerotia* (in the soil) germinate and produce apothecia, and apothecia produce ascospores. These spores attack soybean plants at flowering. Therefore, treatment to protect soybean has to be made before or during the flowering period, depending on chemicals used.

In Iowa, for the first time in the 2009 growing season, we observed wide spread of both the soybean sudden death syndrome (SDS) and white mold (WM). Sporadically, the simultaneous occurrence of SDS and WM had only been observed once in 2007 (X.B. Yang, ICM December 14, 2009). Many growers experienced the occurrence of SDS and WM (Figure 1) on the same farm, and some in the same field. This is complicating management strategies. The objective of this study was to evaluate fungicides against WM alone; since SDS was observed in the same field we considered evaluating the products against SDS as well.

Materials and Methods

The experiments were established in a randomized complete block design with three replications at the ISU Northeast Research

Farm, Nashua, IA. A soybean variety (Pioneer 92M76RR) was planted (203,000 plants/acre) on May 11. Each plot consisted of 30-in. row spacing, 15 ft wide, and 35 ft long. Weeds were kept under control by spraying Roundup Weathermax at 22 oz/acre twice during the season. Plots were evaluated for infected plants, incidence, and severities of WM and SDS on August 3 and 17 and September 1 and 18, 2009. The final disease rating is given in Table 1. Plot yields were measured in bushels/acre.

Results and Summary

The results indicated that seed treatment of soybean with a bio-fungicide (BFNI) reduced both WM and SDS compared with other products tested during the season (Table 1). Also, the yield levels of BFNI treatments were on par with other products tested except the HeadsUp. Protection from white mold by seed treatment could be a result of reducing sclerotial germination of *Sclerotinia sclerotiorum* that were in the vicinity of seed emergence or may have been due to systemic-acquired resistance similar to HeadsUp. Fungicide seed treatment as a preventive measure can increase yields in a season when disease pressure is moderate or high. For a preliminary report on effects of foliar fungicides on soybean yield tested during 2008 growing season please refer to <http://www.ag.iastate.edu/farms/08reports/Northeast/EffectofFoliar.pdf> and to understand minimizing SDS and WM risk in the same field please refer to ICM newsletter December 14, 2009 <http://www.extension.iastate.edu/CropNews/2009/1209yang.htm>.

Table 1. Efficacy results of fungicides on soybean white mold and SDS tested during 2009 at the Northeast Research and Demonstration Farm, Nashua, IA.

Products tested	Application rate	Application method	White mold (WM)			Sudden death syndrome (SDS)			Yield bu/ac
			Plants/plot	Inc %	Sev %	Plants/Plot	Inc %	Sev %	
HeadsUp	1g in 1L of water	Seed treat	30.7	1.5	71.7	3.3	0.2	26.7	71.6
Topsin	19 fl oz/ac	Seed treat	57.0	2.8	70.0	2.3	0.1	10	68.8
BFNI100*	4 ml/kg	Seed treat	13.3	0.7	76.7	0.0	0	0	68.3
BFNI50*	4 ml/kg	Seed treat	16.0	0.8	61.7	0.0	0	0	68.7
Cobra	5 fl oz/ac	Spray at R3	53.3	2.5	70.0	3.0	0.1	13.3	67.3
Headline	6 fl oz/ac	Spray at R3	74.3	3.5	76.7	0.7	0	6.7	69.7
Control	0	Untreated	76.0	3.6	91.7	7.7	0.4	40	69.1

Mean of 3 replications; * = Unregistered bio-fungicide, Plant Pathology Dept, Iowa State University
 Inc = incidence, Sev = Severity; Plot size: 445 to 455 square feet. Products tested in this study during 2009 do not imply endorsement of one over another, nor did discrimination intend against any similar products tested in our studies.

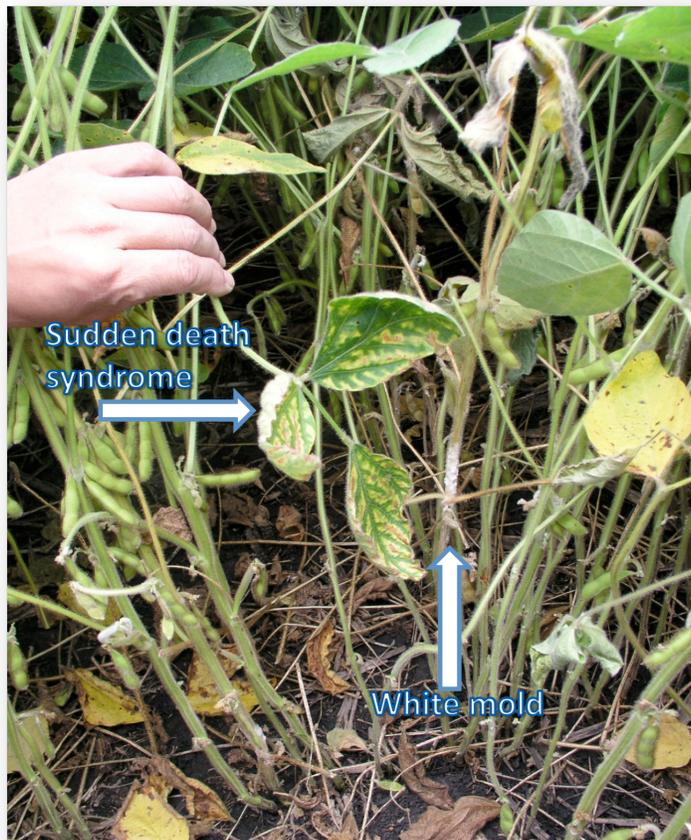


Figure 1. Occurrence of white mold and sudden death syndrome of soybean in the same field during 2009 growing season.