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Physical Compatibility of Turf Fungicides in Hard and Soft Water Chemicals, November 2008

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Introduction

The purpose of this study was to determine whether STBX-013 and Phyton 27 are compatible with other fungicides. Physical compatibility was determined by the amount of settling. We also observed the effect of hard and soft water on compatibility.

Methods

Fungicide combinations were mixed with 1 pint of hard water (from City of Ames tap) or soft water (Scharneweber-Kinetico Water Conditioning Inc., Ames IA) in 1-quart mason jars. Two replications (jars) were made for each water-fungicide combination. The amount of fungicides in each jar was proportional to label rate (Table 1). Order of addition was as follows: 1) wettable powders 2) dry flowables 3) water dispersible granules 4) flowables (liquid) 5) microcapsules 6) solutions, and 7) soluble powders.

Mixing was done by inverting mason jars, once per second for ten seconds. Evaluations were taken 15 and 30 minutes after mixing. After the 30 minutes, jars were remixed to determine if any precipitate that had been formed after the first agitation would return into suspension. These second set of evaluations were made 15 and 30 minutes after the agitation. Trials were conducted twice on separate days.

Combinations were evaluated for physical compatibility based on the presence of

separation of layers, curdling and any other form of sectoring. A numeric rating scale was given to qualitative observation as follows: 0 = no settling; 1 = slight amount of settling; 2 = moderate settling; 3 = all of product settled.

Table 1. Fungicide and amounts used in study*

STBX-013	0.354 mL
Phyton 27	0.566 mL
Daconil Ultrex	2.45 g
Terrazole	0.42 g
Ridomil Gold	0.147 mL
Chipco 26 GT	3.2 mL
Cleary 3336 Plus	3.2 mL
Terraguard 50W	0.295 mL
Medallion	0.383 g
Heritage	0.306 g
Compass	0.142 g

*added to one pt water; proportional to label rates

Results

Observations are presented in Table 2. In general, product mixtures settled slowly, and would readily go back into suspension after the second agitation. We did not observe any curdling, layering, or formation of sludge that would interfere with dispersion from a spray nozzle. No effect of water type (hard vs. soft) was noted.

Conclusions

Based on the evidence from two runs of the jar tests in two types of water (hard and soft), STBX-013 and Phyton 27 are compatible as tank-mix partners with all the fungicides evaluated.

Table 2. Settling amounts* of fungicide combinations when mixed at label rates in 1 pint of water, agitated for 30 seconds, then allowed to settle for 15 and 30 minutes.**

		Soft water				Hard water			
		First Mix		Second Mix		First Mix		Second Mix	
Settling time (min)		15	30	15	30	15	30	15	30
Combined with STBX-013									
Trade name	Product								
Daconil Ultrex	Chlorothalonil	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Terrazole	Etridiazole	1.0	1.0	1.0	1.0	1.0	1.5	1.0	1.5
Ridolmil Gold	Mefanoxam	0	0	0	0	0	0	0	0
Chipco 26GT	Iprodione	1.0	1.5	1.0	1.3	1.0	1.5	1.0	1.8
Cleary 3336 Plus	Thiophanate-methyl	1.0	2.0	1.0	2.0	1.0	2.0	1.0	1.8
Terraguard	Triflumizole	0	0	0	0	0.5	0.5	0.8	0.8
Medallion	Fludioxonil	1.0	1.5	1.0	1.3	1.0	1.8	1.0	1.3
Heritage	Azoxystrobin	0.5	1.0	1.0	2.0	0.5	0.1	0.5	1.0
Combined with Phyton 27									
Trade name	Product								
Terrazole	Etridiazole	1.0	1.5	1.0	1.5	1.0	1.3	1.0	1.0
Medallion	Fludioxonil	1.0	1.0	1.0	1.3	1.0	1.0	1.0	1.5
Compass	Trifloxystrobin	1.0	1.3	1.0	1.0	1.0	1.0	1.0	1.0
Heritage	Azoxystrobin	1.0	1.3	1.0	1.0	1.0	1.0	1.0	1.0

*A numeric rating scale was given to qualitative observation as follows: 0 = no settling; 1 = slight amount of settling; 2 = moderate settling; 3 = all of product settled.

**Observations were averaged between replicates on a given day with the repeated trials from separate days.