

KEYPLEX AN ELICITOR FOR THE CONTROL OF BANANA SIGATOKA

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Abstract

Mycosphaerella musicola which causes Yellow Sigatoka leaf spot is pathogenic to table banana, *Musa acuminata* in south Florida. Field research in central Florida documents that KeyPlex, reduces Greasy spot caused by *Mycosphaerella citri* of citrus. Field and greenhouse studies in 1996 showed that KeyPlex reduced Yellow Sigatoka leaf spot. Black Sigatoka, *Mycosphaerella fijiensis*, was found in south Florida in 1998. Field studies over the past 3 years have shown that KeyPlex DP reduced Black Sigatoka. Banana trees at the research station were reduced to one 'hijo' and weekly applications of KeyPlex DP were commenced on the first unfolded leaf and continued to harvest. The leaves were rated for Sigatoka using a scale of 0 to 5 with 0=no leaf spot, 1=20% area affected, 2=20-40% area affected, 3=40-60% area affected, 4=60-80% area affected, and 5=80-100% area affected. The average severity rating was calculated and statistically analyzed. The KeyPlex formulation evaluated, DP showed significantly lower Sigatoka as compared to the untreated control. The 2 qt. rate was significantly more effective than the one-quart rate for Sigatoka diseases.

BACKGROUND AND OBJECTIVES

Commercial hectares of banana and plantain fluctuate annually in Florida from 100 to 400 ha with a value of \$2,558,000 per year (Degner 1996). Likewise production varies depending upon hectares planted, market potential, climate, insect and disease pressure, cultural practices, and cultivars that are grown. Although yearly estimates vary, annual production in south Florida is approximately 22,000 kg/ha. *Mycosphaerella musicola* which causes Yellow Sigatoka leaf spot is pathogenic to table banana, *Musa acuminata*, in south Florida and was the only form of Sigatoka up to 1998. Black Sigatoka *Mycosphaerella fijiensis* was found in south Florida in 1998. Induction of defense systems in plants can be achieved and enhanced using abiotic elicitors (SAR) which are currently in the trade. The SAR's are compounds that act as signals that stimulate the synthesis of natural products, phytoalexins, and plant pathogenesis-related (PR) proteins (Van Loon et al, 1994) that reduce pest damage (Benhamou and Theriault, 1992; Ebel and Cosio, 1994). Field research studies in central Florida found that KeyPlex 2C reduced greasy spot caused by *Mycosphaerella citri* Whiteside on 'Ray Ruby Red' grapefruit (Timmer and Zitko, 1993). The purpose of this study was to determine if KeyPlex DP would be efficacious on Black Sigatoka as was the case with Yellow Sigatoka (McMillan et al 1998).

MATERIALS AND METHODS

Field trial conducted at the University of Florida, Tropical Research and Education Center, January 2001 to January 2002. KeyPlex DP was applied 5-year-old clumps of *Musa acuminata* 'Dwarf Cavendish' bananas. The clumps of banana were reduced to one 'hijo' per clump which had not unfolded. Weekly applications of KeyPlex DP of 0.95 l. in 378.53 l. of water/ha, 1.90 l. in 378.53 l. of water/ha and an untreated water control at 378.53 l. of water/ha. were continued to harvest. Each treatment was applied 10 'hijo' per plot, replicated four times in a randomized complete block design. All treatments were applied with a hypro pump at 85 psi with a delivery rate of 378.53 l. per ha. The leaves were rated for Sigatoka using a scale of 0 to 5 with 0=no leaf spot, 1=20% area affected, 2=20-40% area affected, 3=40-60% area affected, 4=60-80% area affected, and 5=80-100% area affected. The average severity rating was calculated and statistically analyzed.



RESULTS AND CONCLUSIONS

All KeyPlex DP treatments significantly reduced the incidence of Yellow Sigatoka leaf spot and Black Sigatoka leaf spot as compare to the untreated control Table 1. The 1.90 l. treatment was significantly better than the 0.95 l. rate for Yellow and Black Sigatoka. The mechanism by which the nutritional chemicals reduce the incidence of Sigatoka leaf spot is still not very well understood. The results reported here support that reported by Timmer and Zitko (1993) and McMillan (1998). No phytotoxicity was noted at the 0.95 l. and 1.90 l. rate of the KeyPlex DP formulation evaluated.

Table 1. Effect of KeyPlex DP on Black and Yellow Sigatoka leaf spots.

Number	Treatment	Rate/378.53 l.	Sigatoka Index ^u	
			Yellow ^u	Black ^v
1	Untreated Control		2.8c	5.
2	DP + Kinetic	0.95l.+177.42ml	1.5b	2.3b
3	DP + Kinetic	1.90l.+177.42ml	1.0a	1.9a

^uLeaf spot rating: 0=no leaf spots, 1=20% area affected, 2=20-40% area affected, 3=40-60% area affected, 4=60-80% area affected, and 5=80-100%.
^vColumn means followed by the same small letter do not differ significantly according to Duncan-Waller multiple range test (p=0.05)

Literature Cited

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