



Tropentag, October 9-11, 2007, Witzenhausen

“Utilisation of diversity in land use systems:
Sustainable and organic approaches to meet human needs”

Compatibility of *Striga*-Mycoherbicides with Fungicides Delivered Using Seed Treatment Technology and its Implication for *Striga* and Cereal Fungal Diseases Control

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Abstract

Root parasitic weeds of the genus *Striga* and fungal diseases constitute a major biotic constraint to staple food production in Africa, and consequently aggravate hunger and poverty. With the aim of improving sorghum and maize performance and yield, an investigation on the possibility of delivering *Striga*-mycoherbicides (*Fusarium oxysporum* Foxy 2 & PSM197) and selected fungicides using seed treatment technology to control simultaneously *Striga hermonthica* and sorghum and maize fungal diseases was made for the first time. Film-coated seeds of sorghum with different application rates (dosages) of Apron XL and Ridomil Gold in combination with the mycoherbicides Foxy 2 and PSM197 and different coating adhesives were used. The effects of Apron XL and Ridomil Gold fungicides on growth and sporulation of the two isolates was examined by growing the film-coated sorghum seeds on PDA media. Delivering of the fungicides Apron XL and Ridomil with *Striga*-mycoherbicides Foxy 2 and PSM197 using seed treatment technology did not interfere with the seed coating process nor with the initial survival of fungal isolates on coated sorghum seeds. Apron XL clearly enhanced the growth, sporulation and viability of both isolates, indicating strong compatibility with *Striga*-mycoherbicides. However, Ridomil Gold was not compatible on PDA medium. Under field conditions of West Africa, the integration of fungicide Apron XL (at a rate of 0.5ml kg⁻¹ of seeds) with *Striga*-mycoherbicides (Foxy2 & PSM197) and resistant maize cultivars using seed treatment technology and Arabic gum as adhesive showed significant reduction in *Striga* emergence by 81 % and 90 % compared to the respective resistant and susceptible controls. Improved performance of maize treated with *Striga*-mycoherbicides and fungicide by 300 % was further recorded. The compatibility between *Striga*-mycoherbicides and Apron XL fungicide has significant implication for controlling simultaneously *Striga* and sorghum and maize fungal diseases and improving crop performance and yield.

Keywords: Fungal diseases, fungicides, *Fusarium oxysporum*, integrated control, biological control, mycoherbicide, seed coating, *Sorghum bicolor*, *Striga hermonthica*, *Striga*-resistant cultivar, *Zea mays*

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