

Inclusion of sulphur in fungicide programmes for integrated disease management of soybean

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Abstract

Soybean rust (SBR) and late-season diseases (LSD) significantly threaten soybean production worldwide. This study aimed to evaluate the effectiveness of incorporating sulphur into fungicide programmes for managing SBR and LSD in soybeans and to optimize these programmes with novel fungicide combinations. Field experiments were conducted over two phases across multiple localities and seasons in Paraguay. Phase 1 assessed the impact of sulphur-enriched fungicide programmes on disease control efficacy and soybean yield. Phase 2 optimized fungicide programmes by integrating sulphur with new fungicide combinations. Disease severity, area under the disease progress curve (AUDPC), thousand-grain weight (TGW) and yield were measured. Treatments combining sulphur with multi-site and site-specific fungicides significantly reduced the severity and progression of SBR and LSD compared to treatments without sulphur or the untreated control. Control efficacies exceeded 86% for SBR and were around 77% for LSD. Despite significant reductions in disease severity, yield and TGW did not always show significant increases, likely due to environmental factors. Incorporating sulphur into fungicide programmes effectively reduces SBR and LSD in soybean crops, enhancing disease control efficacy. Environmental conditions influenced treatment efficacy, underscoring the need for site-specific disease management strategies. Integrating sulphur with fungicides represents a viable approach to optimize soybean disease management and promote sustainable production systems.