

MON 95379 as a new tool for the management of maize lepidopteran pests in South America

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Abstract

The fall armyworm (FAW), *Spodoptera frugiperda* and sugarcane borer (SCB), *Diatraea saccharalis* are key pests of maize in Brazil and Argentina. Genetically modified maize, producing *Bacillus thuringiensis* (*Bt*) proteins, has revolutionized the management of these pests in South America. Field-evolved resistance to *Bt* maize technologies was observed for these two species and new technologies are required for the management of these pests. The pyramided genetically modified maize event MON 95379, expressing the Cry1B.868 and Cry1Da_7 proteins, was developed to protect the plants against the damage caused by FAW and SCB. We assessed the efficacy of MON 95379 in laboratory, greenhouse and field conditions. The MON 95379 maize and both experimental maize lines expressing single protein (Cry1B.868_single and Cry1Da_7_single) were effective in controlling susceptible FAW laboratory leaf disc bioassays. For SCB, the MON 95379 and Cry1B.868_single maize resulted in 100% mortality of SCB, but the Cry1Da_7 resulted in <20% mortality on Cry1Da_7_single leaf tissue, evidencing that this protein does not have high efficacy against SCB. In greenhouse whole-plant assays, MON 95379 controlled FAW and SCB resistant to the MON 89034 maize (Cry1A.105/Cry2Ab2) and SCB resistant to Cry1Ab protein. Under field conditions in Brazil (FAW) and Argentina (FAW and SCB), MON 95379 event consistently protected the maize plants from the damage of FAW and SCB. The MON 95379 event will bring value to growers in South America by effectively protecting the maize plants from damage caused by FAW and SCB, being an important tool to manage resistant populations in the field.

Key words: *Spodoptera frugiperda*, *Diatraea saccharalis*, *Bt* plant, insect resistance management