The high-dose / refuge approach is used globally as IRM strategy to manage resistance development in Bt crops. The “refuge in the bag” (RIB) strategy is also considered as IRM strategy. The target stem borer in South Africa (SA) is *Busseola fusca* which also developed resistance to Bt maize (MON810). The main reason for *B. fusca* developing resistance was ascribed to non-compliance with refuge requirements. Since 2011 event MON89034 that controls MON810-resistant *B. fusca* is also planted in SA. The objective of this study was to determine whether migrating larvae of *B. fusca* will be controlled effectively by using the RIB approach.

A field study with MON810 and MON89034 was done in which the migration patterns of *B. fusca* larvae inside different RIB treatments were studied. The experiment consisted of five seed mixture ratios (5%, 10%, 15%, 20% and a non-Bt control), each replicated 4 times. Natural infestation commenced 5 weeks after emergence and was augmented by artificial inoculation with neonate larvae into the central non-Bt maize plant of each plot. The rate of larval survival and migration, measured in terms of increase in number of plants that exhibited borer damage over time was recorded weekly for five weeks after inoculation.

The rate of survival and migration was significantly higher in MON810 and control plots than in MON89034 plots. Since the increase in damage over time, is associated with migration of older and larger larvae, the observed tendencies may indicate that the assumed high-dose does not kill larvae above a certain developmental stage.

The use of a seed mixture with MON810 will provide no IRM benefit in areas where resistance has already developed. The 5% seed mixture was most effective at controlling migrating larvae over time. However, migration of larger larvae late in the season may result in survival of individuals that developed on non-Bt plants and then migrated to Bt-plants, thereby contributing to survival of RS individuals and resistance development. The comparative efficacy of the high-dose/refuge and RIB strategies needs careful consideration before large scale deployment of the latter.

Keywords: *Busseola fusca*, insect resistance management, migration pattern, “Refuge in the Bag”