Abstract

Combination of pest management strategies that minimize pesticide use and conserve natural enemies is important for a sustainable environment. Overreliance on synthetic insecticides in the management of *Tuta absoluta* has led to pesticide resistance leading to difficulties in managing the pest. In this regard, alternative measures need to be put in place to reduce the effects of this pest. The objective of this study was, therefore, to assess the effectiveness of host plant resistance, biological control, and selective insecticides when used in combination, in the management of *T. absoluta* in tomato production. The study was set up in a greenhouse in a completely randomized design involving two tomato varieties, an insecticide (chlorantraniliprole), and a biological control agent(*Macrolophus pygmaeus*), applied singly or in combination. Data were collected on *T. absoluta* damage from the lower, intermediate, and upper leaves. The results from this study show that a combination of insecticide with a moderately resistant variety had a significantly lower *T. absoluta* damage as compared with a susceptible variety combined with an insecticide. However, the moderately resistant variety when combined with insecticide showed no effect when the biological control agent was added. The susceptible variety significantly reduced *T. absoluta* damage when combined with the biological control agent. These results indicate that treatment combinations in insect pest management can be utilized. The present study results indicate that using a moderately resistant variety (Riogrande VF) in combination with the insecticide chlorantraniliprole (Coragen®) and a susceptible variety (Pesa F1) in combination with the biological control agent (*M. pygmaeus*) can improve *T. absoluta* management. Under good habitat management, the susceptible variety will perform equally as the moderately resistant variety due to suppression of the *T. absoluta* populations by natural enemies. These findings show the importance of environmental conservation both by enhancing natural enemy abundance and use of selective insecticide in the management of *T. absoluta* in tomato production. Combinations in this present study are likely to reduce insecticide doses, thereby reducing the cost of production and enhancing environmental compatibility with natural enemies.