

## Yield Loss in Maize Due to Stem Borers and Their Integrated Management

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**Abstract :** Maize (*Zea mays* L.) an important cereal crop in the world has diversified uses including human consumption, animal feed, and industrial uses. A major constraint in low productivity of maize in India is undoubtedly insect pests particularly two species of stem borers, *Chilo partellus* (Swinhoe) and *Sesamia inferens* (Walker). The stem borers cause varying level of yield losses in different agro-climate regions (25.7 to 80.4%) resulting in a huge economic loss to the farmers. Although these pests are rather difficult to manage, efforts have been made to combat the menace by using effective insecticides. However, efforts have been made in the present study to integrate various possible approaches for sustainable management of these borers. Two field experiments were conducted separately during 2016-17 at Main Agricultural Research Station, University of Agricultural Sciences, Dharwad, Karnataka, India. In the first experiment, six treatments were randomized in RBD. The insect eggs at pinhead stage (@ 40 eggs/plant) were stapled to the under surface of leaves covering 15-20 % of plants in each plot after 15 days of sowing. The second experiment was planned with nine treatments replicated thrice. The border crop with NB -21 grass was planted all around the plots in the specific treatments while, cowpea intercrop (@6:1-row proportion) was sown along with the main crop and later, the insecticidal spray with chlorantraniliprole and nimbecidine was taken upon need basis in the specific treatments. The results indicated that the leaf injury and dead heart incidence were relatively more in the treatments T<sub>2</sub> and T<sub>4</sub> wherein, no insect control measures were made after the insect release (58.30 & 40.0 % leaf injury and 33.42 and 25.74% dead heart). On the contrary, these treatments recorded higher stem tunneling (32.4 and 24.8%) and resulted in lower grain yield (17.49 and 26.79 q/ha) compared to 29.04, 32.68, 40.93 and 46.38 q/ha recorded in T<sub>1</sub>, T<sub>3</sub>, T<sub>5</sub> and T<sub>6</sub> treatments, respectively. A maximum yield loss of 28.89 percent was noticed in T<sub>2</sub> followed by 19.59 percent in T<sub>4</sub> where no sprays were imposed. The data on integrated management trial revealed the lowest stem borer damage (19.28% leaf injury and 1.21% dead heart) in T<sub>5</sub> (seed treatment with thiamethoxam 70FS @ 8ml/kg seed + cow intercrop along with nimbecidine 0.03EC @ 5.0 ml/l and chlorantraniliprole 18.5SC spray @ 0.2 ml/l). The next best treatment was T<sub>6</sub> (ST+ NB-21 borer with nimbecidine and chlorantraniliprole spray) with 21.3 and 1.99 percent leaf injury and dead heart incidence, respectively. These treatments resulted in highest grain yield (77.71 and 75.53 q/ha in T<sub>5</sub> and T<sub>6</sub>, respectively) compared to the standard check, T<sub>1</sub> (ST+ chlorantraniliprole spray) wherein, 27.63 percent leaf injury and 3.68 percent dead heart were noticed with 60.14 q/ha grain yield. The stem borers can cause yield loss up to 25-30 percent in maize which can be well tackled by seed treatment with thiamethoxam 70FS @ 8ml/kg seed and sowing the crop along with cowpea as intercrop (6:1 row proportion) or NB-21 grass as border crop followed by application of nimbecidine 0.03EC @ 5.0 ml/l and chlorantraniliprole 18.5SC @ 0.2 ml/l on need basis.

**Keywords :** Maize stem borers, *Chilo partellus*, *Sesamia inferens*, crop loss, integrated management

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