

Efficacy and economics of some neem based products against tobacco caterpillar, *Spodoptera litura* F. on soybean in Madhya Pradesh, India

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ABSTRACT

A field experiment was conducted at Zonal Agricultural Station (JNKVV), Powarkheda during kharif 2004 and 2005. Six neem based products and quinalphos (0.04 %) were evaluated to assess the efficacy and economics in managing the *Spodoptera litura* in soybean. Quinalphos (0.04%) application was proved to be most effective, it reduces 73.28 per cent larval population, with the highest seed yield (1183.13 kg/ha) and incremental cost benefit ratio [(ICBR) (7.40)]. Among the neem based products, application of Neem Seed Kernel Extract (NSKE) 5% + Neem Leaf Extract (NLE) 10% reduces the maximum larval population (51.59%) and gave the seed yield (987.66 kg/ha). However the ICBR showed that the application of NSKE 5% (2.44) proved economically most viable amongst the neem based treatments, followed by NLE 5% (2.20).

Key words : Soybean, *Spodoptera litura*, Neem, ICBR

INTRODUCTION

Soybean is an important *kharif* crop of Madhya Pradesh. The crop is attacked by large number of insect pests, which are one of the major constraints in soybean production in the state. *Spodoptera litura* F., commonly known as Tobacco caterpillar has been reported on soybean in M.P., U.P., Delhi, Maharastra, Karnataka, Orissa, and H.P. (Singh *et al.*, 1989). The pest appeared in serious form on soybean crop during *kharif*, 2003-04; causing severe yield losses in Hoshangabad, Harda and Chindwara district of Madhya Pradesh. Several liquid and dust formulations have been recommended for control of the pest. To avoid the serious residual, resistance problems and ecological consequences due to chemical, the plant products derived from *Neem* were tested against the *Spodoptera litura* on soybean.

MATERIALS AND METHODS

Experiments were conducted during two kharif seasons (2004 & 2005) at Zonal Agricultural Research Station, Powarkheda (M.P.). The experiment was laid out in randomized Block Design with three replications. There were eight treatments (Table no.1), which were applied twice at fifteen days interval. The plot size was maintained to be 5 X 2.4 m comprised of six rows at a row distance of 30 cm. Prior to first treatment application, mechanical removal of egg masses/ early instars larvae was carried out uniformly in all the plots. Observation on larval population on per meter row length from 3 random spots was recorded one day before and 3, 5, 7, and 15 day after treatment from each plot, while the per cent

pod damage and grain yield was recorded at harvest. Data so obtained were transformed by $\sqrt{X+1}$ of larval population, while the percent pod damage were transferred by Arc sin transformation prior to statistical analysis. Results obtained were given and discussed in result and discussion section.

RESULTS AND DISCUSSION

The pooled data of two years (Table 1) revealed that the pretreatment larval population in different treatments had non-significant differences, and ranged from 15.61 to 28.22 larvae per meter row length. While the Post treatment mean larval population per meter row length ranged from 2.18 to 8.16 in various treatments and differed significantly. Larval population was found to be significantly lowest in quinalphos (0.04%) application (2.18). Neem based treatments, although, proved to be significantly inferior then the quinalphos but was superior and had significantly low larval population (3.95 to 6.01) as compared to the control (8.16). Among Neem based treatments, the application of Neem Seed Kernel Extract (NSKE) 5% + Neem Leaf Extract (NLE) 10% (3.95) was the most effective, followed by NSKE 5% + NLE 5% (4.13), and were significantly at par with each other, while the later was at par with NSKE 5% (5.50).

Maximum larval reduction of 73.28 per cent was achieved in case of quinalphos (0.04%) treatment. In various Neem based treatments the larval population reduction varied from 29.17 to 51.59 per cent as compared to control. The NSKE 5% + NLE 10% reduced the larval population by 51.59 per cent, followed by NSKE 5% +

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