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POPULATION DYNAMICS OF SOYBEAN GIRDLER BEETLE *OBEREOPSIS BREVIS* SWEDENBOARD

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ABSTRACT

Field experiments were conducted during kharif 2017 and 2018 at the farm of AICRP on Soybean, Vasantrao Naik Marathwada Krishi Vidyapeeth (VNMKV) Parbhani (Maharashtra) to evaluate the population dynamics of soybean girdler beetle *Oberopsis brevis* Swedenboard. The infestation got initiated in 30th and 31st meteorological week (MW) during both the years. At the time of physiological maturity peak infestation was observed during 40th and 41st MW. The infestation was observed to be significantly positively correlated with bright sunshine hours (2017) and negatively and significantly with wind velocity (2018). The losses caused by *O. brevis* was observed to be influenced by crop stages and infestation levels.

Key words: Soybean, girdle beetle, *Oberopsis brevis*, population dynamics, correlation, weather factors, bright sunshine hours, wind velocity, crop loss assessment

Soybean is one of the most important leguminous crops originating from China (Hymowitz, 1970). India ranks fifth in area of soybean in the world after USA, Brazil, Argentina and China. Soybean crop attracts about 380 species of insects in many parts of the world (Luckman, 1971). In Maharashtra, especially in Marathwada 19 species of insects have been observed attacking this crop (Munde, 1982). Among them girdle beetle (*Obereopsis brevis* Swedenboard) and stem fly (*Melanagromyza sojae* Zehnter) are important; the former *O. brevis* is a major pest of soybean as compared to other stem pests. The losses caused due to this range from 19.5 to 30.72% (Ansari and Sharma, 2005). The evaluation of its population dynamics will help in developing predictive models and will aid in forecasting the incidence. With this objective, this study explores the infestation of girdle beetle on soybean in relation to weather factors.

MATERIALS AND METHODS

The field experiment was conducted during kharif 2017 and 2018 at the farm of All India Coordinated Research Project on Soybean, Department of Agricultural Entomology, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani. To study the population dynamics of *O.brevis*, the experiment was conducted in unprotected plot which was non-replicated and the plot size was 10 x 10 m which was divided in four quadrants. JS 335 (Jawahar) variety was used with spacing of 45 cm row to row and 5 cm of plant to plant. Observations were made at weekly intervals starting from seven days after germination, with 1 m row length marked at five places, and total number of plants and girdled plants were counted and the data converted to % infestation. The correlation and regression were worked out from these as per Panse and Sukhatme (1967) using WASP software.

RESULTS AND DISCUSSION

The infestation of *O.brevis* started from 30th and 31st MW (2.0%) during kharif 2017 and 2018, respectively (Fig. 1); and increased at the time of physiological maturity to 13.0 and 12.0% (40th and 41st MW, in kharif

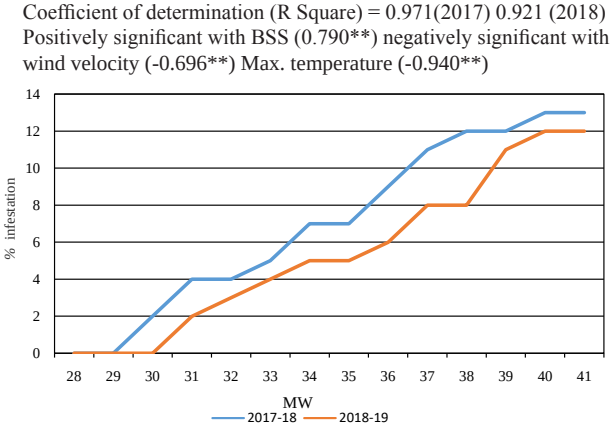

Fig. 1. Infestation by *O. brevis* on soybean (2017-18, 2018-19)

2017 and 2018, respectively); thus the infestation that initiated during the first week of August reached peak during first week of October. Thereafter the infestation remained constant up to harvesting. Motaphale et al. (2016) observed that peak infestation was during 40th and 41st MW, while Neeta Gaur et al. (2015) found its peak activity at 84 days after sowing. These observations corroborate the present ones. Chechani et al. (2000) observed that its infestation commenced at 30 days of sowing and increased up to 75 days of sowing. The infestation when correlated with weather factors, as given in Fig. 1, during 2017-18, infestation exhibited a positively significant correlation with bright sunshine hours (r=0.790**). During 2018-19, infestation was found correlated highly negatively and significantly with wind velocity (r=-0.903**). Bembalkar (2012) observed that infestation of *O. brevis* in relation to bright sunshine hours was positively correlated and significant. Sonule et al. (2019) also observed such a positive correlation (r=0.543*) with sunshine hours, also with wind velocity (r=-0.899**) exhibiting a negative and significant one. These observations are similar with the present findings. The weather parameters contributed for 97.1 and 92.1 % of total variation in the infestation of *O. brevis* on soybean during 2017-18 and 2018-19, respectively.

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