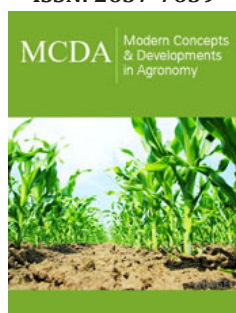


Study Report of Insect Damage on Field Chili Pepper Fruits

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Abstract

Chili peppers are favored worldwide and in Hungary as well, however limited information is available about the varieties and the adequate cultivation techniques (such as irrigation, plant density) and their plant protection aspects under field conditions in the European region. The present study aims to announce the results on insect damage found on two chili pepper varieties (Yellow Scotch Bonnet and Trinidad Scorpion Butch T) cultivated by two different irrigation frequencies and two different plant-to-plant distances. We give details about the circumstances and outcomes of the survey.

Keywords: *Capsicum chinense*; *Helicoverpa armigera*; *Halyomorpha halys*; *Nezara viridula*; Thripidae; Plant distance; Irrigation

Experience Report

Study was carried out at the experimental field of the Institute of Horticultural Science, Hungarian University of Agriculture and Life Sciences, Gödöllő, Hungary (47.58N, 19.37E). In total twenty-four plots were set up and plot size was determined in conforming to the amount of available seedlings. The same adjustments were carried out both years. However in 2021, due to the low plant germination rate and the weather conditions in May, plot size and the study field was smaller than in 2019. Chili pepper (*Capsicum chinense* Jacq.) varieties (Trinidad Scorpion Butch T, Yellow Scotch Bonnet) were planted in plots of 12.96m² (3.6 x 3.6m) in year 2019 and 2.16m² (1.8 m x 1.2m) in year 2021. Eight different combinations of settings were used. Each variety was planted in two different plant distances and two different irrigation frequencies by drip irrigation were used. There were three replications.

The coding of the treatments were as follows:

- A. V1: Trinidad Scorpion Butch T
- B. V2: Yellow Scotch Bonnet
- C. V1PS1: Plant spacing of 60cm
- D. V1PS2: Plant spacing of 40cm
- E. V2PS1: Plant spacing of 40cm
- F. V2PS2: Plant spacing of 30cm
- G. I1: Irrigation daily, 40 minutes (7.33L/m /day)
- H. I2: Irrigation every second day, 20 minutes (3.66L/m / two days)

Seeds were sowed in seedling trays on 12 March in 2019 and 7 April in 2021 and they were stored, first, in a germination chamber, and later, in a nursery. Seed dressing by spores of *Pythium oligandrum* mycoparasite fungi was used each year. Seedlings were planted on 24 May 2019 and 25 June 2021. Plants were harvested on 11-12 September in 2019 and 11 October in 2021. Except for seed dressing, no pesticide applications were used during the vegetation periods.

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Since under field conditions in Hungary, thrips species, Pentatomid bugs and cotton-bollworm are the common pests on pepper, we focus on the damage of these insects on the fruits. Ten plants per plot per year were selected randomly during the harvest and all fruits were checked carefully visually. Data were aggregated and analyzed using R [1] with Rcmdr package [2].

In both vegetation periods, the amount of healthy fruits was the highest in all treatments, and the productivity of Yellow Scotch Bonnet variety was bigger than the productivity of Trinidad

Scorpion Butch T variety. In the first year, the damage of different insects was similar in the treatments, except for Pentatomid bugs, *Nezara viridula* and *Halyomorpha halys*. In the year 2021, the number of damaged and undamaged fruits was higher than in the previous year, except for Trinidad Scorpion Butch T variety. In 2021, the damage of *Helicoverpa armigera* was the most frequent on the fruits of Yellow Scotch Bonnet variety, whereas the less in the case of Trinidad Scorpion Butch T variety. In the second growing season, the damage of thrips and stink bugs was similar in the different treatments (Figure 1 & 2).

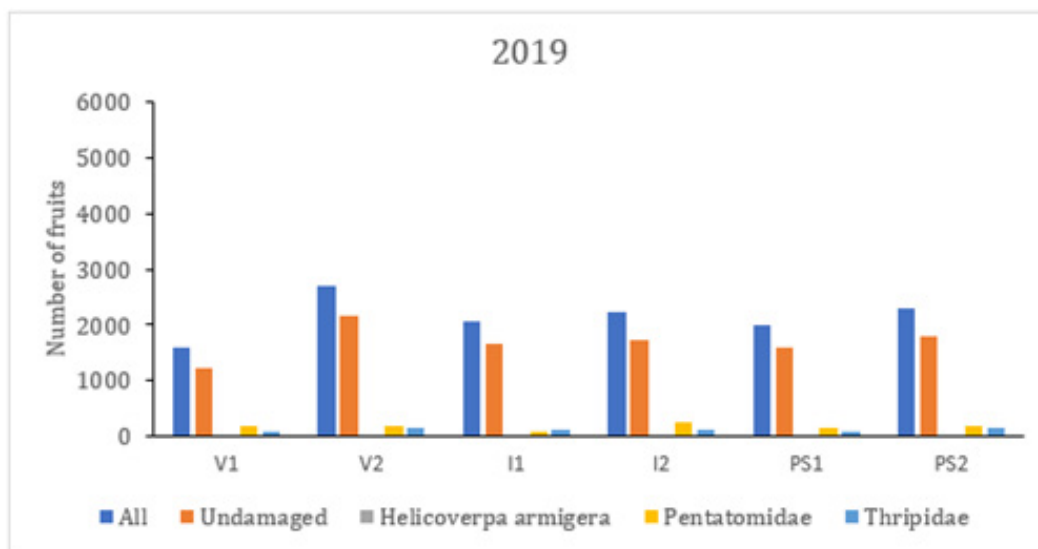


Figure 1: Number of all, undamaged and damaged chili pepper fruits by insect pests by treatments in 2019. V1: Trinidad Scorpion Butch T; V2: Yellow Scotch Bonnet; I1: Irrigation daily, 40 minutes; I2: Irrigation every second day, 20 minutes; PS1: increased plant distance; PS2: decreased plant distance.

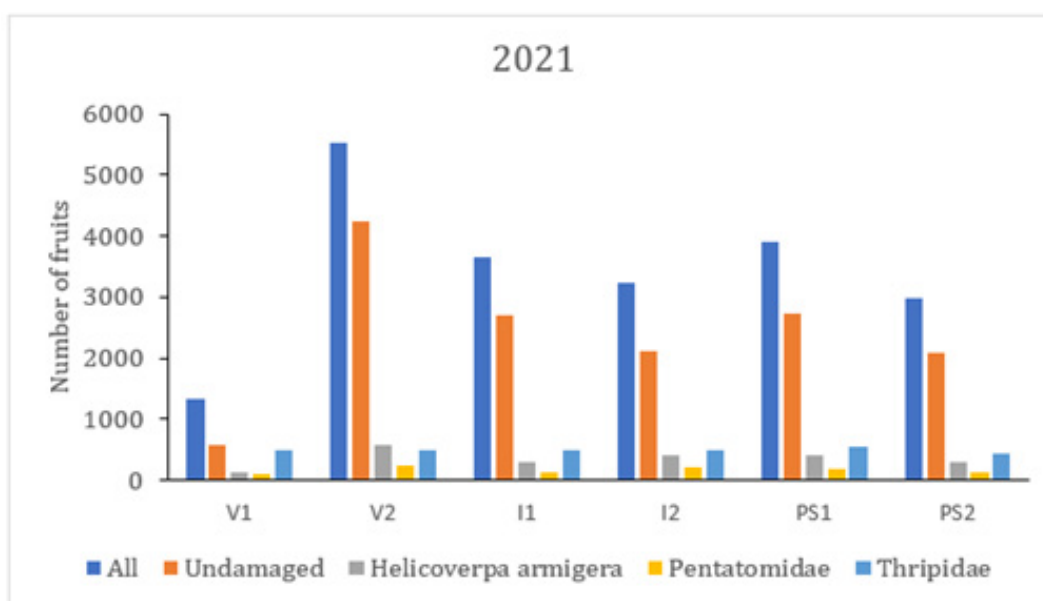


Figure 2: Number of all, undamaged and damaged chili pepper fruits by insect pests by treatments in 2021. V1: Trinidad Scorpion Butch T; V2: Yellow Scotch Bonnet; I1: Irrigation daily, 40 minutes; I2: Irrigation every second day, 20 minutes; PS1: increased plant distance; PS2: decreased plant distance.

Conclusion

According to our observations, the damage was below the economic threshold both years. The most popular and promising method to reduce pests is the alteration of plant distance [3]. However in our experiment the damage of studied insects was similar by the different plant spacings. We found higher number of damaged fruits by Pentatomid bugs by less irrigation both years. Therefore these taxa seem to prefer the fruits occurring in the less irrigated plots with a less humid microclimate.

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