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"Resilience of agricultural systems against crises"

Effects of Sanitation and using Insect-Proof Screens on Population Density of *Chaetosiphon fragaefolii* (Cockerell) on Strawberry under Greenhouse Conditions

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Abstract

The strawberry (*Fragaria ananassa* Duchesne) hosts a wide variety of aphid species. *Chaetosiphon fragaefolli* (Cockerell) (Homoptera: Aphididae) produces honeydew where sooty molds grow, leading to downgrading of the fruit. Although aphids are not the main pests in strawberry fields, strawberry aphid can be a serious problem because it can transmit viruses such as cytorhabdovirus, one of the most dangerous viruses affecting strawberry. In this study, strawberry plants cultivar Selva, were grown to determine the effect of crop sanitation and the use of insect-proof screens on the population density of *C. fragaefolii*, under greenhouse conditions (L:D 14:10, 26±2°C Temp., and 60±10 % R.H.). A field experiment was conducted during the 2010/2011 season, in two experimental greenhouses of the Iranian Research Organisation Science and Technology (IROST) in Tehran, Iran. Experiments were performed as factorial experiments in a completely randomised design with two factors, which were sampling time (at eight different times), and the type of greenhouse (organic and untreated (control) greenhouse) with ten replications. In the organic greenhouse, the crop sanitation and the insect-proof screens were used in order to protect the strawberry greenhouses for excluding aphid. Prior to planting, 13×23 screens (13×23 threads cm^{-2}, 13×23 screens have 13 threads by 23 threads in a centimeter square) were installed in all windows and doors of the greenhouse. The results indicate that under the conditions of the experiment aphid populations were significantly different in the greenhouses ($F = 208.2688$, $p < 0.0001$, $df = 1$). *C. fragaefolii* populations in the control greenhouse were significantly greater than populations in the organic greenhouse at all times of sampling. However, there was no significant difference between sampling times. There was also not a significant difference in time of sampling × type of greenhouse interaction, which suggested that difference in aphid population across a type of greenhouse was not relative to sampling times. Moreover, results showed that no aphid was found in the organic greenhouse in all the sampling times. It is concluded that sanitation and using insect-proof screens for *C. fragaefolii* populations control will benefit by decreasing insecticide application and have advantages in strawberry aphid integrated pest management programs.

Keywords: *Chaetosiphon fragaefolli*, organic greenhouse, sanitation, strawberry

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