

The Study Of Population Dynamics Of Dominant Leafhoppers In Cereal Fields In Shahrekord Province

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ABSTRACT

In this study population dynamics of dominant leafhoppers of Shahrekord cereal fields in Chaharmahal va Bakhtiyari in four fields was evaluated in a randomized complete block design. Among all fields' leafhoppers *P. alienus* had the highest average abundance and *E. decipiens* had the lowest average abundance between dominant leafhoppers. Leafhopper *M. laevis* in early-sowing wheat field two peaks of population activity in fourth week of October and fourth week of April respectively were observed, in late-sowing wheat field one peak of population activity in second week of July, in barley field one peak of population activity in third week of June and in maize field one peak of population activity in first week of July were recorded. Leafhopper *P. alienus* in early-sowing wheat field three peaks of population activity in first week of November, third week of April and fourth week of June respectively, in late-sowing wheat field one peak of population activity in first week of July, in barley field one peak of population activity in second week of July and in maize field two peaks of population activity in second week of July and third week of September respectively were recorded. Results showed that in late-sowing wheat field, leafhoppers because of cold winter could not settled in this field and were not observed until the end of overwintering. Planting of wheat in early to mid-November can prevent infection by leafhoppers population and thus reduces more damage to crop and decreases viral diseases.

Key words: Leafhopper, Vector, Population Dynamics, Cereals

INTRODUCTION

Specific climate conditions around the Shahrekord province provide suitable conditions for cereal. Leafhoppers are the most important sucking pests in this crops. These insects sometimes can transmit disease. Leafhoppers in two ways: direct and indirect (viral and phytoplasma diseases) make major damage to wheat, barley and maize fields (Culy, 2001; Sahragard, 2006). Studies of researchers of department of plant protection research of

agricultural and natural resources research center of Chahar Mahal va Bakhtiari province in recent years has shown that there are high population leafhoppers in Shahrekord plain cereal fields and feeding activity of these pests certainly plays a role in reducing cereals crop (Sahragard *et al.*, 2010). Applied goals that are followed in this study, is that by doing it take the great step in order to help farmers and producers for pest control and reduction of viral diseases and thereby reduce damage to crops, and research centers in the country in solving this pests problem and in a word, to support national production.

MATERIALS AND METHODS

Investigations have been carried out in the biennium 2011-2012, in four fields early-sowing wheat, late-sowing wheat, barley and maize. Location of experiment was in agriculture and natural resources center of Chaharmahal va Bakhtiari station. This experiment was evaluated in a randomized complete block design. Sampling systematically and weekly between the hours of 10 to 12 in the morning by standard sweeping net (length of 150 cm and 30 cm diameter) was done. In each sampling time, 10 samples were collected from the fields, that each sample was included 10 times the sweeping net handling. Data obtained from Samplings was recorded in special table carefully and analyzed by SAS statistical software. Also the average abundance of leafhoppers species per square meter in the fields was calculated by using Excel software.

RESULTS AND DISCUSSION

Species of leafhoppers *Macrosteles laevis*, *Psammotettix alienus*, *Empoasca decipiens* and *Laodelphax striatellus* were identified as dominant leafhoppers of cereal field. These leafhoppers are vectors of viral and viral-like diseases in Chaharmahal va Bakhtiyari province, and they have particular importance, and sometimes they cause economic damage. Among all four fields' leafhoppers *P. alienus* had the highest average abundance and *E. decipiens* had the lowest average abundance between dominant leafhoppers. For leafhopper *M. laevis* in early-sowing wheat field two peaks of population activity in fourth week of October and fourth week of April respectively were observed, in late-sowing wheat field one peak of population activity in second week of July, in barley field one peak of population activity in third week of June and in maize field one peak of population activity in first week of July were recorded.



Macrosteles laevis (Ribaut, 1952) *Psammotettix alienus* (Dahlbom, 1851) *Empoasca decipiens* (Paoli, 1930) *Laodelphax striatellus* (Fallen, 1826)

Figure 1. Species of dominant leafhoppers of cereal field

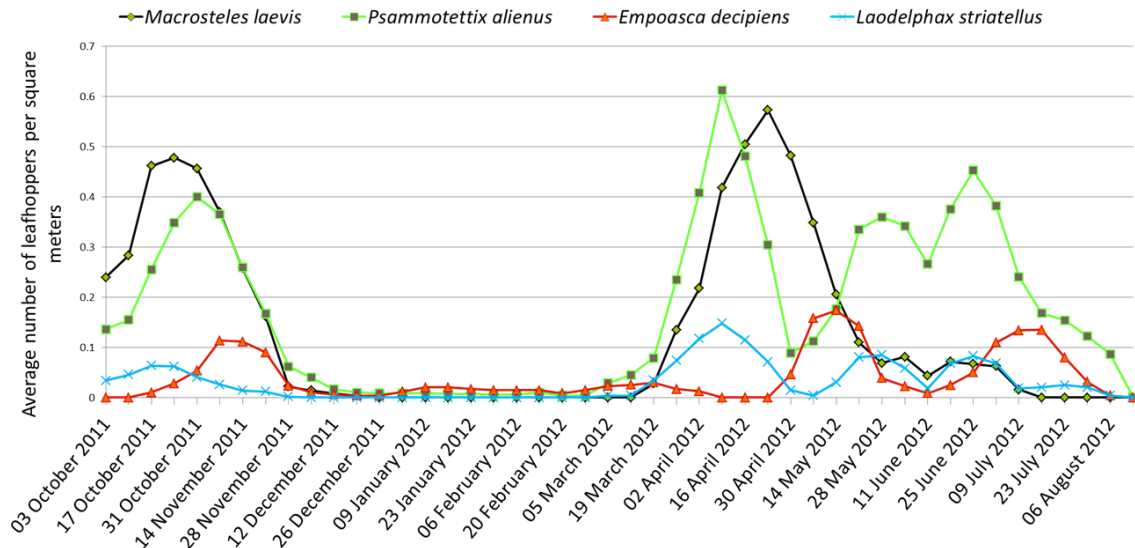


Figure 2. Population dynamics of dominant leafhoppers

For leafhopper *P. alienus* in early-sowing wheat field three peaks of population activity in first week of November, third week of April and fourth week of June respectively, in late-sowing wheat field one peak of population activity in first week of July, in barley field one peak of population activity in second week of July and in maize field two peaks of population activity in second week of July and third week of September respectively were recorded. For leafhopper *E. decipiens* in early-sowing wheat field three peaks of population activity in second week of November, third week of May and third week of July respectively were observed, in late-sowing wheat only a very few number were found in May and August; and in maize field one peak of population activity in third week of July was recorded. Results showed that in late-sowing wheat field, leafhoppers because of very cold winter could not settled in this field and were not observed until the end of overwintering, and the population abundance was much lower compared with population in early-sowing wheat field. Planting of wheat in early to mid-November can prevent infection by leafhoppers population and thus reduces more damage to crop and decreases viral diseases.

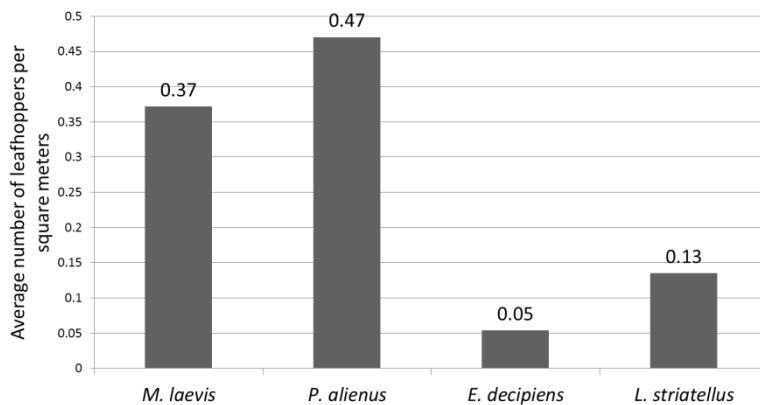


Figure 2. The mean abundance of leafhoppers per square meters in total of four fields

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