The Quarterly Scientific Journal of Applied Biology

Vol.36, No.4, Sering. 78, Winter 2024, p. 5-7

Journal homepage: https://jab.alzahra.ac.ir

doi.org/10.22051/jab.2023.43019.1549

Study of Tolerance some of Alfalfa Genotypes (*Medicago sativa* L.) to alfalfa Weevil (*Hypera postica* Gyll.)

Sahar Bakhtiarian[1], Mehdi Kakaei*[2] and Hojatollah Mazahery Laghab*[3]

1-M. Sc. Former plant Breeding, Department of Production Engineering and Plant Genetics, Bu-Ali Sina University, Hamedan-Iran.

2- Associate Professor Plant Breeding, Department of Agricultural Science, Payame Noor University, Tehran-Iran. *(Corresponding Author2: M.Kakaei@pnu.ac.ir)

3- Associate Professor of Plant Breeding, Department of Production Engineering and Plant Genetics, Bu-Ali Sina University, Hamedan-Iran. * Correspondent author1: Hojat.mazahery@yahoo.co.uk

Introduction:

Cultivated alfalfa, which is known as green gold, is one of the best and most suitable fodder plants known in the world. Leaf weevil pest of alfalfa is considered as one of the limiting stresses in alfalfa production in the conditions of Iran. The use of tolerant cultivars is a safe and beneficial way to control the leaf weevil pest in alfalfa. Green and juicy alfalfa fodder or dried and ensiled can be used for livestock and contains large amounts of protein, carbohydrates, mineral salts and vitamins needed by livestock. In addition to its role in feeding livestock, it has a special value in human nutrition directly or indirectly, in the preparation of green manure, fertility and prevention of soil erosion.

The yield of forage with high nutritional value has been and continues to be the primary goal of forage growers (Eckberg, et al., 2022). Forage yield is a quantitative genetic trait controlled by genetic and environmental factors (Ren, et al., 2021).

In other words, in addition to agricultural benefits, alfalfa has many positive effects on the environment in terms of increasing soil fertility. Among these positive effects are as follows Protection against soil erosion, low nitrogen fertilizer requirements due to its ability to biologically fix nitrogen and the ability to provide nitrogen for the next crop. Reducing energy and greenhouse gas emissions and maintaining plant and animal biodiversity (Tucak, et al., 2023 & Julier, et al., 2017). Tucak, et al., 2023 in the study of some alfalfa populations stated that the results showed that there is a statistically significant difference between alfalfa

experimental populations and years in terms of fodder and grain yield. The purpose of this research is the primary and basic measure to identify cultivars tolerant to leaf weevil pest in alfalfa plants in Hamadan conditions.

Material and Methods

In order to investigate the genetic diversity and the relationship between yield and resistance of alfalfa to the red weevil, 30 varieties of different alfalfas (Table 1) from native (Iranian) and non-native (foreign) alfalfas that exist in the populations in Germ The plasma of the research farm of Bu-ali Sina University of Hamedan, which had 4 China, were examined in the first China. Genotypes were cultivated on 2-meter cultivation lines with a distance of 50 cm from each other. This research was carried out as a farm, in a land with an area of 900 square meters in the Dastjard area of Hamedan, with a longitude of 48 and 28 and a latitude of 34 and 54 with an altitude of 1810 meters above sea level became. The available germplasm was cultivated in the field in a completely random design. Irrigation was done once every 8 days. All traits were measured with standard methods and statistical analysis of data was done using MINITAB, SAS and SPSS software.

Findings

The interaction between the varieties and the levels of pest attack showed significant differences in relation to weevil number, fresh forage yield, dry forage yield, plant height at the time of harvesting at1% and the amount of damage at 5% probability. The number of larva had significant positive correlation at a level of 5% with damage amounts. In stepwise regression, damage percent as dependent and other traits as independent variables were used. The results showed that larvae number, leaf chlorophyll extent and plant height with 30/01 cumulative coefficient explained the most variations of damage percent.

Conclusion

Considering to the percent of damage and the average comparison for other traits, Yazdi35 and Maoopa102 with the least number of larvae and the least percent of damage respectively and the highest height in attack or damage time as the most tolerance and cultivars Tak Buteh92 and MahalieMiandoab with the most larval number, damage percent and the lowest plant height were recognized as the most susceptible cultivars towards alfalfa weevil attack at damage time too.

Keyword: Correlation, Genetic Diversity, Germplasm, *Hypera postica*, Tolerance.

Acknowledgement: The current research has been financially supported by Bu-Ali sina University and also, we thank all those who helped us in the process of making this report.

Declaration of conflict of interest: *The authors declare that they have no conflicts of interest.*

Statement on ethics:

The authors declare that this work has not been published elsewhere nor submitted to another publication simultaneously.