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Assessment of environment effect on yield component in barley (*Hordeum vulgare* L.) genotypes under rainfed conditions

Öztürk, İ.

Trakia Agricultural Research Institute, Edirne, Turkey, e-mail: ozturkirfan62@yahoo.com

Purpose. This research was carried out to assess barley genotypes yield and quality parameters under various environmental conditions. **Methods.** The experiments were set up with 25 barley genotypes in a completely randomized blocks design with four replications at four locations in the 2018–2019 cycles in the Trakia region, Turkey. Data on grain yield, plant height, days of heading, 1000-kernel weight, test weight, protein ratio and grain uniformity were investigated. **Results.** The combined ANOVA revealed significant differences ($p<0.01$) among genotypes and environments for all parameters investigated. In the study genotype G4 (8514 kg ha^{-1}) had a higher yield followed by G9 (8369 kg ha^{-1}). The highest thousand kernel weight was 52.0 g in G14 and the test weight was 75.1 kg in genotype G5. There was a significant difference among genotypes for protein ratio and genotype G22 had a higher protein ratio, followed by genotypes G23 and G24. The grain uniformity in barley is an essential parameter and G14 had a higher ratio of grain uniformity. Correlation analyses showed that a negative correlation was determined between grain yield with days of heading (r=-0.506**), plant height (r=-0.583**), and protein ratio (r=-0.542**). 1000-kernel weight and test weight were significantly positively correlated (r=0.708**). Grain uniformity had a positive correlation with 1000-kernel weight (r=0.898**) and test weight (r=0.539**). Protein ratio was positively associated with plant height (r=0.692**). According to stability analysis genotypes G9, G3, G15, G2, and G17 were adaptable to less fertile environmental conditions. It was determined that G10 and G16 were well adaptable to all environmental conditions and also were ideal in terms of higher-yielding ability and stability. **Conclusions.** While genotype G9 has high yield potential, G10 and G16 have high adaptability to different environmental conditions. The environmental effect was found to be very important according to the parameters examined. Early and short genotypes have higher yield potential. Environment E4 was the ideal environment because located close to the first concentric circle in the environment-focused biplot. Therefore, it should be regarded as the most suitable to select widely adapted genotypes

Keywords: *barley; genotypes; yield component; environment effect.*

İrfan Öztürk
https://orcid.org/0000-0002-1858-0790

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Diversity analysis amongst *Juglans regia* L. genotypes using molecular markers

Sankhyan, S.[1, 2]*, Kaur, R.[1]

[1]Department of Biotechnology, Dr Yashwant singh Parmar University of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh India.
[2]Department of Biotechnology, Chandigarh University, Gharuan, Mohali, Punjab, India,
**e-mail: shailjabiotech@gmail.com*

Purpose. On the basis of a comprehensive study of the genetic diversity among 37 genotypes of Persian walnut by using Molecular marker. **Methods.** Field, Laborartry, Isolation, Gelelectrophoresis, software and mathematical statstics. **Results.** The results of this study shows that 22 ISSR produced amplification out of 30 primers. Amplification of Genomic DNA from 37 genotypes using 22 ISSR generated a total of 849 scorable bands. The similarity coefficient values ranged from 0.583 to 0.962.Dendrogram was generated based on the similarity matrix data applying unweighted pair group method with arithematic averages (UPGMA). Cluster analysis was done using SAHN module of NTSYS-pc computer programme 2.02h .The tested 37 genotypes were divided into two cluster i.e 'E' and 'F'. Cluster E was further subdivided into E1 and E2. The cluster E1 and E2 contained 28 and 8 genotypes whereas cluster F contained only 1 genotype. **Conclusion.** The ISSR markers

Shailja Sankhyan
https://orcid.org/0000-0002-9292-3990
Shailja Sankhyan
https://orcid.org/0000-0002-9292-3990

used have shown a high level of polymorphism in the 37 genotypes of Juglans regia L., revealing their efficiency for diversity analysis studies. This will not only help in authentic identification of the walnut germplasm but later can be used in breeding programmes.

Keywords: *Walnut; Juglans regia; Molecular Marker; ISSR; Genetic diversity.*

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Walnuts with a commercial potential in Latvia

Stalažs, A.

Institute of Horticulture, Latvia University of Life Sciences and Technologies, Graudu iela 1, Ceriņi. Krimūnu pagasts, Debeles novads, LV-3701, Latvia, e-mail: arturs.stalazs@llu.lv

Purpose. Persian walnut (*Juglans regia*) is one of the most commercially important nut-crop in the world. The nuts of these plants contain a lot of fat, also proteins and carbohydrates. Their nutritional value is significant, as nuts contain a lot of calories and several dietary minerals as well. Walnut cultivation in Latvia used to be fragmentary in past, but these plants are used in breeding work in Latvia as well. Climate changes have created better conditions for growing walnuts, so they can be commercially promising in Latvian conditions as well. Until now, these plants have been little popularized, and their cultivation in Latvian conditions has never been wider explored. **Methods.** An initiative by Finnish colleagues in 2021 to obtain walnut genetic material that could be promising for Finnish conditions resulted in amount of important information obtained in several expeditions. During the expeditions, as far as possible, also by surveying citizens, information was obtained both about some particular walnut trees and about the distribution of walnuts in Latvia. The expeditions were carried out in 2021 and continued in 2022. **Results**. It was found that Persian walnut is grown in Latvia much more than these plants were previously reported in the literature. In terms of climate, Kurzeme and Zemgale regions are more suitable, where these trees are found the most. There is only one commercial plantation in Latvia with an area of 11 ha. Generally, walnuts are grown in backyard gardens, they are specially planted in several cities (e. g. Dobele, Jūrmala and Ventspils). Trees have also been preserved from the material of Latvian breeders. The best trees are from Viktors Vārna and Pēteris Upītis breeding material. Some trees are from Artūrs Mauriņš material. The last breeding was done in Latvia by Gunvaldis Vēsmiņš. Plants of his selection have also been planted in the first commercial orchard, as well as better known to public. It is necessary to think about the further identification, evaluation and preservation of the most valuable genotypes of the walnut grown in Latvia. Special attention should also be paid to plants that were planted in the first half of the 20th century which has survived number of harsh winters. **Conclusions.** Latvia has sufficient genetic material that can be of commercial importance in the south-western part of the country.

Keywords: *genetic resources; Juglans regia; promising crop.*

Arturs Stalažs
https://orcid.org/0000-0002-3971-6255