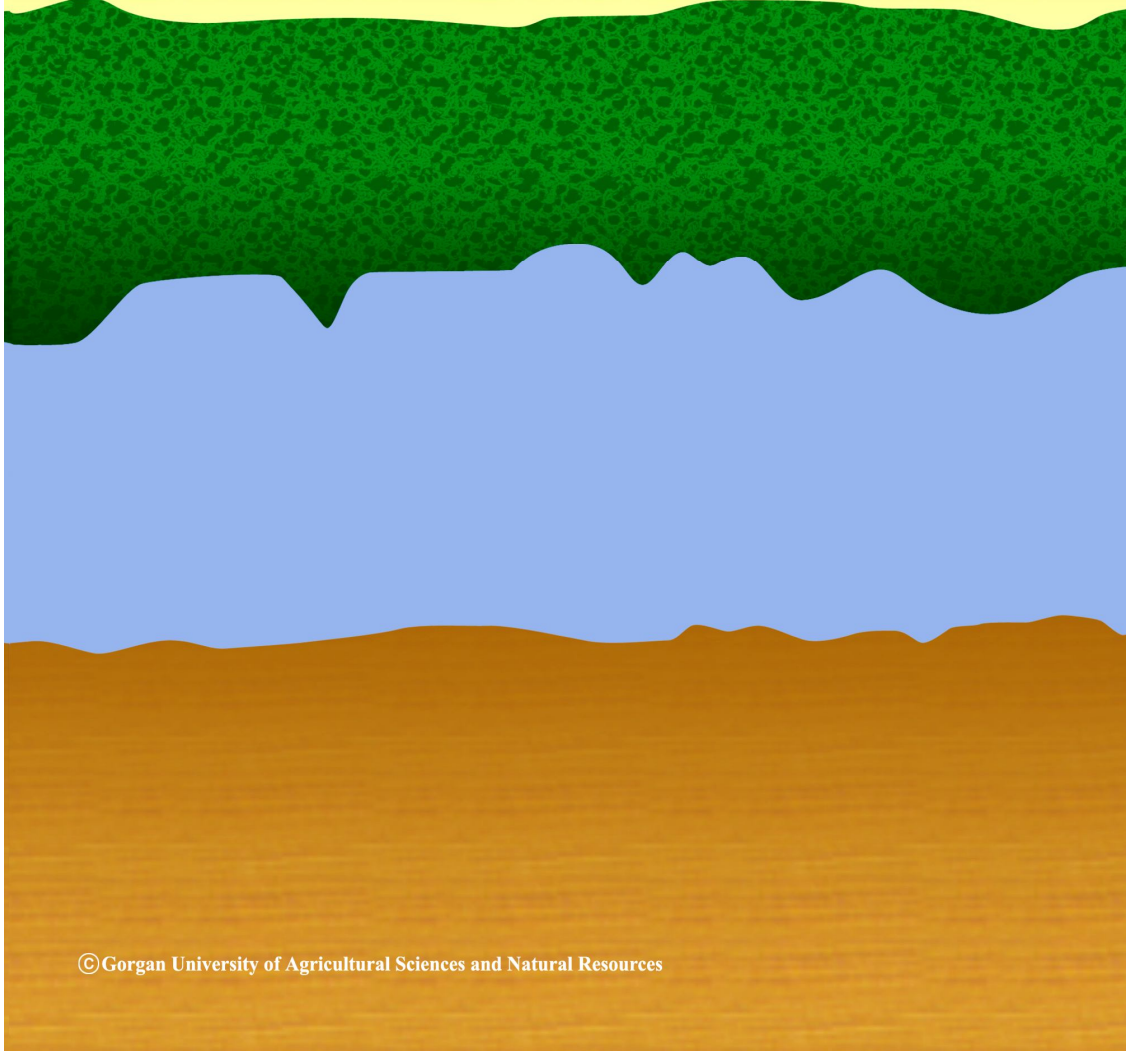


Vol. 11, No. 3, July 2017

ISSN:1735-6814



International Journal of  
*Plant Production*



© Gorgan University of Agricultural Sciences and Natural Resources

# International Journal of Plant Production



Gorgan University of Agricultural  
Sciences and Natural Resources

## **Executive Director:**

Najafinejad, A., President of GUASNR, Gorgan, Iran

## **Editor-in-Chief:**

Soltani, A., GUASNR, Gorgan, Iran

## **Editors:**

Bagherieh-Najjar, M.B., Golestan University, Gorgan, Iran

Kamkar, B., GUASNR, Gorgan, Iran

Khormali, F., GUASNR, Gorgan, Iran

Sadeghipour, H.R., Golestan University, Gorgan, Iran

## **Editorial Board Members:**

Ehdaie, B., University of California, Riverside, CA, USA

Fallahi, E., University of Idaho, Parma, Idaho, USA

Gholipoor, M., Shahrood University of Technology, Shahrood, Iran

Hashemi, A., University of Massachusetts Amherst, MA, USA

Hoogenboom, G., Washington State University, Prosser, WA, USA

Kashaninejad, M., GUASNR, Gorgan, Iran

Manschadi, A.M., University of Natural Resources and Life Sciences, Vienna, Austria

Montemurro, F., Research Unit for Cropping Systems in Dry Environments (SCA), Metaponto, Italy

Pala, M., Ankara, Turkey

Robertson, M.J., CSIRO, Wembley, Australia

Sepaskhah, A.R., Shiraz University, Shiraz, Iran

Sharifani, M.M., GUASNR, Gorgan, Iran

Shiraiwa, T., Kyoto University, Kyoto, Japan

Siddique, K., the University of Western Australia, Crawley, Australia

Walayar, F., ICRISAT, Bamako, Mali

Yu, Q., University of Technology, Sydney, Australia

## **Editorial Manager:**

Hajjarpoor, A., GUASNR, Gorgan, Iran

## **Executive Manager:**

Eimantalab, M., GUASNR, Gorgan, Iran

**Aims and Scope:** International Journal of Plant Production (IJPP) publishes original research papers and review papers related to physiology, ecology and production of *field crops and forages* at field, farm and landscape level. IJPP does not publish papers with a background in genetics and plant breeding, plant molecular biology, plant biotechnology, as well as soil science, meteorology, product process and post-harvest management unless they are strongly related to plant production under field conditions.

Papers should be original, unpublished and not being considered for publication elsewhere. Papers based on limited data or of local importance, and results from routine experiments will not normally be considered for publication. Field experiments should include at least two years and/or two environments. Papers on plants other than field crops and forages, and papers based on controlled-environment experiments will not be considered.

Preferred topics are: (1) yield gap in cropping systems: estimation, causes and closing measures, (2) ecological intensification of plant production, (3) improvement of water and nutrients management in plant production systems, (4) environmental impact of plant production, (5) climate change and plant production, and (6) responses of plant communities to extreme weather conditions.

**Publishing plan:** IJPP is published in yearly volumes of four issues on January, April, July and October.

**Contact information:** Journals Office, Vice-Presidency for Research, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan 49138-15739, Iran.

Website: [www.ijpp.info](http://www.ijpp.info), Email: [ijpp@gau.ac.ir](mailto:ijpp@gau.ac.ir), Phone: +98-17-32245884, Fax: +98-17-32225989



## Contents

H. Ding, Z. Zhang, T. Kang, L. Dai, D. Ci, F. Qin, W. Song Rooting traits of peanut genotypes differing in drought tolerance under drought stress .....	349
J.K. Xu, Y. Shi, Z.W. Yu, J.Y. Zhao Irrigation methods affect wheat flag leaf senescence and chlorophyll fluorescence in the North China Plain.....	361
O. Sedlář, J. Balík, J. Černý, M. Kulhánek, F. Vašák Relation between nitrogen nutrition index and production of spring malting barley.....	379
T. Kassu, H. Tilahun, D. Yared, H. Watanabe Effect of irrigation regimes on yield and water use efficiencies of potato.....	389
T. Zhou, K.W. Xu, W.G. Liu, C.C. Zhang, Y.X. Chen, W.Y. Yang More aboveground biomass, phosphorus accumulation and remobilization contributed to high productivity of intercropping wheat.....	407
S. Ghassemi, K. Ghassemi-Golezani, S. Zehtab-Salmasi, S. Alizadeh-Salteh Improving essential oil content and yield of ajowan organs under water stress by application of salicylic acid and abscisic acid.....	425
Y. Wang, J.W. Lu, T. Ren, S. Hussain, Q. Jia, J.L. Zhang, M. Yousaf, X.K. Li Influence of tiller heterogeneity on yield components of rice grown under different nitrogen regimes .....	437
A. Woźniak, M. Soroka Effect of tillage systems on weed infestation of durum wheat.....	453