J Nutr Food Sci 2018, Volume: 8
DOI: 10.4172/2155-9600-C5-066

Food safety assessment of maize genotypes to Fusarium ear rot and fumonisin accumulation in Iran

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Fusarium ear rot (FER) of maize by Fusarium verticillioides is one of the most important of corn diseases in the world and named as world problem. It has the high potential for producing different mycotoxins especially fumonisins which are harmful to animal and human that its feed is along with incidence of cancer in human. One of the most effective methods of FER control is the use of resistant cultivars that has positive environmental effects, so that it does not consume fungicide in corn fields. In this study total fumonisins production level of each genotype was estimated using an ELISA test. In order to evaluate different maize genotypes to Fusarium ear rot, an experiment was carried out with 12 lines and 17 hybrids in 2015 and 19 lines and 12 hybrids in 2016 in RCBD with three replications at Karaj and Sari stations. In this investigations all ears of plants was inoculated by nail punch technique at flowering stage. At physiological maturity, evaluation was conducted by using disease severity index (1-6). The results of combined analysis showed that there is a significant difference among hybrids and lines on disease severity.Among hybrids, (KSC 709 and K3615/2 × K19) and among lines, (K18 and K19) were identified as resistant and susceptible respectively. Fumomisins production analysis of different maize genotypes in both Karaj and Sari locations showed different levels of total fumonisins production. The results also demonstrated that there is a positive correlation between resistance to disease and fumonisin production on genotypes, whereas line K18 specified as the most resistant with low fumonisin and hybrid K3615/2 × K19 specified as the most susceptible with high fumonisin production level at experimental stations.

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