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MOLECULAR ASSESSMENT OF F. GRAMINEARUM IN SEVERAL MOLDAVIAN MAIZE GENOTYPES

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Fusarium graminearum is a typical pathogen of many cereal crops, causing grain, stalk and seedling rots. In maize, this pathogen causes Giberella ear blight and is able to infect kernels through the stigma. Optimal conditions for the development of the fungus include moderate temperatures around 25°C and high humidity, and the species is distributed throughout the maize cultivation region. It has been established that some strains of *F. graminearum* can synthesize DON mycotoxin, which is highly toxic and provokes alimentary-toxic aleukia. Non-compliance with the rules of corn agrotechnology, in particular, non-compliance with crop rotation, insufficient tillage, too high planting density, irrational use of fertilizers and pesticides can induce DON synthesis in toxigenic *F. graminearum* strains.

Molecular diagnostics of toxigenic strains of *F. graminearum* was carried out in kernel samples of several local maize genotypes grown under field conditions in the Republic of Moldova. The fungus was identified using the nested-PCR method with primer pairs based on the *F. graminearum* genomic cluster of the fungus involved in DON synthesis (*Fusarium graminearum isolate 23-4 Tri core gene cluster, complete sequence*). External pair: ftri8gr1 (forward) - CTTCCGGTAATGTTTCTCGTCACT, ftri8gr4 (reverse) - CGCTGCTGAGGGTTTTACCAT. Internal pair: fqtri8gr2 (forward) - CTCGTCACTTCCTTGATGACACA, fqtri8gr3 (reverse) - GGGGGCCGACATTCACTTC. Comparison of the frequency of infection of the studied samples with the control genotype B73 was carried out using the Student's test for two independent samples ($p<.05$).

In 2020, there was a decrease in the frequency of infection by the fungus for all genotypes, which was due to high temperatures and low rainfall in the spring-summer period. On the contrary, in 2021, which was characterized by moderate temperatures, high air humidity and heavy rainfall during the period from April to July, an increase in the infection rate of *F. graminearum* in corn kernels was observed. The highest mean frequency of infection was noted for kernels of the CP137 and CP148 genotypes. At the same time, KU123 and MK01 genotypes showed the lowest frequency of infection with *F. graminearum*; the average infection frequency during the observation period did not exceed 30%. A statistically significant lower infection frequency was observed for genotypes KU123 ($t=2.38$, $p=.02$) and MK01 ($t=2.84$, $p=.01$), while for CP137 and CP148 there was no significant difference in the frequency of *F. graminearum* in comparison with the susceptible line B73. Thus, the locally bred genotypes MK01 and KU123 are of interest for breeding programs aimed at obtaining maize lines and varieties with increased resistance to *F. graminearum*.

Keywords: *Fusarium graminearum*, genotype, pathogen, nested-PCR, frequency of infection.