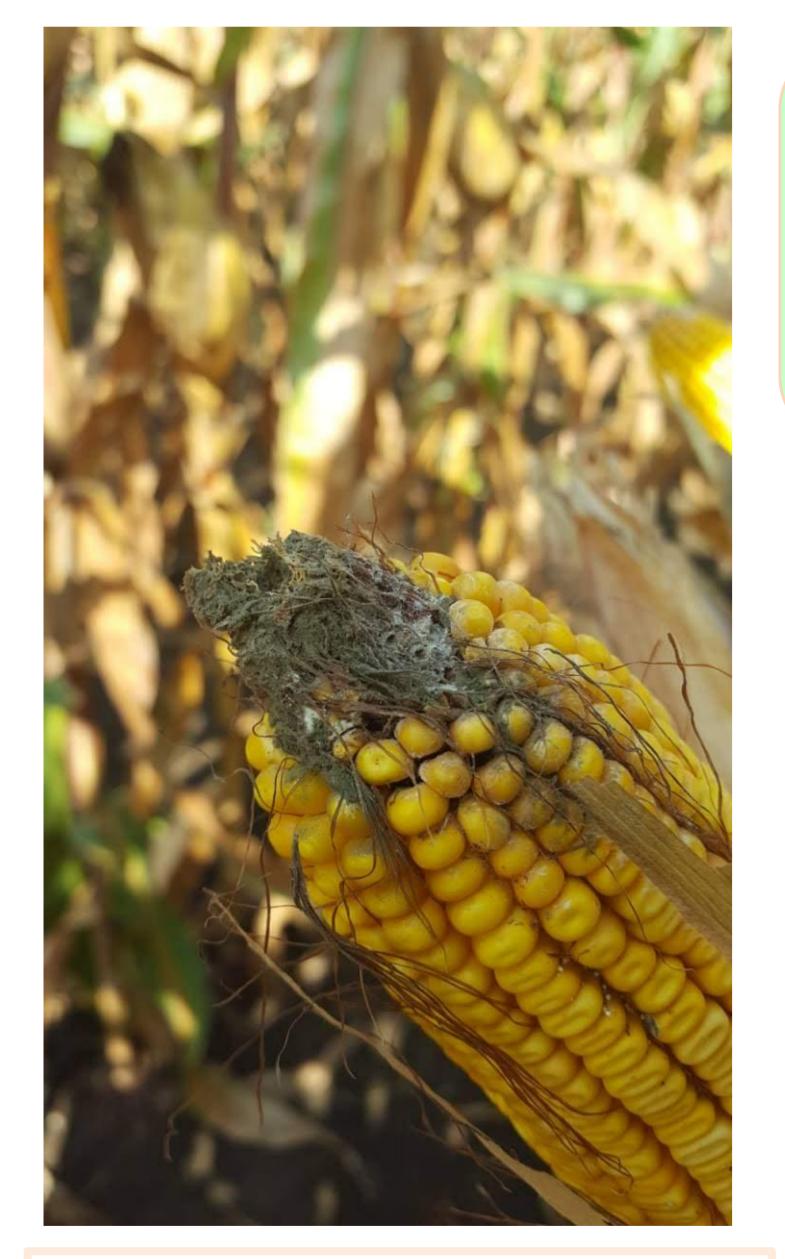# THE AFLATOXIN B1 INCIDENCE IN MAIZE DURING 2017 IN VOJVODINA

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Aflatoxins are highly toxic secondary metabolites of fungi, produced mainly by *Aspergillus* species and often found as contaminants in a vast range of agricultural products. Climate conditions in Serbia are favorable for growth and toxin production of *Aspergillus* fungi, especially in the years with severe droughts and extremely high temperatures, as in 2012, when large quantity of the maize crop was contaminated with aflatoxins. During 2017, the mean daily temperatures were 0.9 – 1.7 °C higher than the multiannual average and precipitations were 20% lower than the multiannual average. Warmer and dryer weather conditions posed a risk of aflatoxin contamination; therefore, screening of aflatoxin B1 levels in maize samples was performed.c

In total, 45 representative samples of maize kernels from commercial fields were analyzed. Samples and information about maize hybrids were collected during harvest from 11 localities in the northern Serbian province of Vojvodina. Each sample was used for *Aspergillus* spp. isolations and for aflatoxin analysis. Isolation was performed by spreading the suspension containing 5 g of grounded maize and 25 ml of Tween 80 onto CU (Clean Up) medium, in three replications. After incubation (48 h on 37⁰C), colonies were counted and the number of colony forming units (CFU) was calculated per 1 g of maize sample. Liquid chromatography-tandem mass spectrometry (LC-MS/MS) was used for screening of Aflatoxin B1.

Photo 1. Symptom of *Aspergillus flavus* infection of maize ear

Photo 2. Colonies of *Aspergillus flavus* isolated from maize samples on CU (Clean Up) medium

Aflatoxin B1 was detected in 53.3% of samples, with the average contamination level of 21.3 µg/kg. The highest level detected was 146.8 µg/kg and the lowest was 0.8 µg/kg. The *Aspergillus* spp. colonies were isolated from all maize samples. The average number of CFU per 1 g of maize was 6560.2. Additionally, Spearman correlation was performed using Statistica 13. to determine if there were correlations among aflatoxin levels, number of CFU and FAO groups of maize hybrids. A strong positive correlation (r = 0.83) was found between Aflatoxin B1 levels and the number of CFU, while there were no other correlations at 95% confidence level.

Maize is one of the main strategic products in Serbia, which is also among the top ten exporters of maize in the world. Screenings like this are necessary to assure the good quality of the commodity for both health and economic reasons.