

Title Characterization and mycotoxigenic potential of *Fusarium* Species in freshly harvested and stored sugar beet in Europe

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Abstract

Based on a 2-year field trial at two locations in Lower Saxony (Germany), 395 *Fusarium* isolates belonging to 13 species were collected from more than 3,000 sugar beet roots that were apparently healthy at harvest. In a comparative screen, subsamples were analyzed for *Fusarium* infection directly after harvest and after different storage conditions. Depending on the storage duration, a different species composition was observed. *F. redolens* was predominant in freshly harvested beets, while *F. culmorum*, *F. cerealis*, and *F. graminearum* comprised 50.0% (2006) and 84.8% (2007) of the *Fusarium* mycoflora of sugar beets subjected to long-term pile storage. Randomly selected isolates of all species detected were tested for pathogenicity to sugar beet, but only isolates of *F. graminearum* and *F. sambucinum* caused severe root symptoms. Overall, 34 isolates of all species detected were characterized for their mycotoxin profile in rice culture to determine potentially produced toxins for future analysis of sugar beet. A total of 26 *Fusarium* mycotoxins were detected by liquid chromatography-tandem mass spectrometry, including trichothecenes, zearalenone, and especially high amounts of beauvericin, enniatins, and moniliformin. Further work is required to analyze the natural occurrence of these mycotoxins in sugar beet.