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CHARACTERIZATION OF *FUSARIUM SECORUM*, A NEW SPECIES CAUSING FUSARIUM YELLOWING DECLINE OF SUGAR BEET IN NORTH CENTRAL USA

**Caractéristiques de *Fusarium secorum*, nouvelle espèce causant un jaunissement des betteraves sucrières au nord/centre des États-Unis /
Charakterisierung von *Fusarium secorum*, eine neue Spezies, die in den Nord- und Zentral-USA Fusariumwelke an Zuckerrüben verursacht**

ABSTRACT

An aggressive disease of sugar beet in the production area of ND and MN in the USA has been spreading since first discovered in 2008. The disease, named Fusarium yellowing decline, is similar to Fusarium yellows but causes earlier infection of petioles and roots and rapid death of plants. Isolates of Fusarium were consistently recovered from diseased sugar beet roots and were able to cause the disease in greenhouse trials. Based on culture morphology and molecular phylogenetic analyses of three loci (translation elongation factor1 α , calmodulin, mitochondrial small subunit) the disease is caused by a distinct Fusarium species in the *Fusarium fujikuroi* species complex. It can be distinguished morphologically from other Fusarium spp. by the bright orange color on the underside of culture media, circinate hyphae, sparse macroconidia production and abundant corkscrew-shaped hyphae in culture. Collectively, these data suggest that a novel *Fusarium* sp., tentatively named *Fusarium secorum*, is the cause of Fusarium yellowing. *F. secorum* has a limited host range based on field and greenhouse testing of crops commonly used in rotation with sugar beet, and infects only sugar beet and canola, and is asymptomatic in canola. In greenhouse trials, a wound is not required for infection and disease development. *F. secorum* has an optimum growth temperature of 24°C. The natural occurrence of this novel *Fusarium* pathogen of sugar beet may have implications in breeding for resistance to Fusarium yellows, since yellow decline has been observed in purportedly *Fusarium* tolerant cultivars.
