

HANSON, LINDA E., USDA-ARS, SBRU, 494 PSSB, Michigan State University, East Lansing, MI 48824-1325. **Fusarium seed stalk blight and rot in sugar beet.**

### ABSTRACT

*Fusarium* stalk blight of sugar beet can cause reductions or complete loss of seed production. The causal agent is *Fusarium oxysporum*, and may be *Fusarium oxysporum* f.sp. *betae* (FOB), the cause of Fusarium yellows. In addition, *Fusarium solani* has recently been demonstrated to cause a rot of sugar beet seed stalk, and other species have been reported associated with sugar beet seed or fruit, but their effect on seed production is not known. We sampled diseased seed stalks and examined isolates for their pathogenicity and virulence on sugar beet seed stalks in greenhouse tests and in the laboratory on detached seed stalk sections. Isolates of FOB representing three different genetic groups also were examined for their effect on seed stalks. Seed stalk tissue of sugar beet germplasm that had been found to vary in response to FOB or in response to stalk blight in field screening were inoculated by three different methods. The same germplasm also were tested for their response using the standard test for yellows. *Fusarium oxysporum* was the most commonly isolated species from seed stalks, but two other species also were isolated from stalk lesions. Isolates of *Fusarium solani* from seed stalk caused localized lesions on the stalk following inoculation. Lesions did not kill the seed stalk of any germplasm tested, but weakened the stalk such that it broke readily at the site of infection. The *F. solani* stalk isolates did not cause any visible symptoms in a yellowing screen and did not cause any visible root rot on the varieties tested. *Fusarium oxysporum* isolates caused more extended lesions that initially showed vascular discoloration. Several seed stalks also showed symptoms of necrosis on one half of a leaf before the entire leaf was affected. All of the *F. oxysporum* seed stalk isolates that caused stalk blight also caused typical yellows symptoms. A larger proportion of *F. oxysporum* isolates from diseased seed stalks were pathogenic on beet in all assays used than the proportion of pathogens usually reported from Fusarium yellows root isolations (98% and 19-25% respectively). Isolates of *F. oxysporum* f. sp. *betae* caused seed stalk blight when inoculated into either intact or detached seed stalks. Symptoms were similar with all inoculation methods. Sugar beet germplasm differed in stalk blight response and disease response correlated well between yellows tests and seed stalk blight tests for several germplasm with *F. oxysporum*. The third species isolated from beet stalks caused extensive lesions that girdled the seed stalk on one sugar beet germplasm, but only small localized lesions on two other germplasm. One of these germplasm was highly susceptible to *Fusarium oxysporum* but showed little response to the other two *Fusarium* species from seed stalks.