

## POTENTIAL PRIMARY SITE OF INFECTION OF *CERCOSPORA BETICOLA* IN SUGAR BEET

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### ABSTRACT

Repeated observations of isolated, growth reduced sugar beet plants with *Cercospora* leaf spot symptoms as early as late June, early July made us question the primary infection site of this pathogen. In this study we showed that it is possible to obtain leaf spot symptoms in the greenhouse as soon as two weeks after immersion of sugar beet seedling roots in conidial suspensions of *Cercospora beticola*. Not all infected seedlings showed leaf spot symptoms. In future research the use of molecular techniques will help to detect *C. beticola* in sugar beet plants without symptoms.

### ABRÉGÉ - SITE POTENTIEL D'INFECTION PRIMAIRE DE *CERCOSPORA BETICOLA* EN BETTERAVE SUCRIERE

Suite à des observations répétées de plantes de betteraves isolées à développement ralenti et présentant des symptômes de *Cercospora beticola* dès la fin du mois de juin, nous nous sommes interrogés sur le site d'infection primaire de ce pathogène. Dans cette étude, nous avons montré qu'en conditions de serre les taches foliaires peuvent apparaître endéans les 2 semaines après immersion de plantules de betteraves dans une suspension de conidies de *C. beticola*. Toutes les plantules infectées ne présentaient pas de symptômes. Les recherches futures visent à développer des outils moléculaires pour détecter ce champignon dans des plantes ne présentant pas de symptômes.

### KURZFASSUNG - POTENZIELLER ORT DER ERSTINFEKTION VON *CERCOSPORA BETICOLA* AN ZUCKER RÜBEN

Nach wiederholten Beobachtungen an isolierten, im Wachstum reduzierten Zuckerrüben mit frühen Symptomen der *Cercospora*-Blattfleckenkrankheit Ende Juni, Anfang Juli haben wir uns nach dem möglichen Ort der Erstinfektion des Erregers gefragt. In dieser Arbeit haben wir zeigen können, daß es möglich ist, unter Gewächshausbedingungen Symptome von Blattflecken innerhalb von zwei Wochen nach Eintauchen der Wurzeln von Zuckerrüben-Sämlingen in eine Konidien suspension von *Cercospora beticola* zu erhalten. Nicht alle infizierten Sämlinge zeigten Blattflecken. In der zukünftigen Forschung wird die Nutzung molekularer Techniken helfen, *C. beticola* in Zuckerrüben nachzuweisen, die

ohne Symptomen sind.

Repeated observations of isolated, growth reduced sugar beet plants with *Cercospora* leaf spot (CLS) symptoms as early as late June, early July made us question the primary infection site of this pathogen. CLS, caused by *Cercospora beticola*, is reported to survive in leaf debris in the soil and spreads from the soil to the cotyledons by splash dispersal. Later, secondary infection spreads between the leaves. In this study, a previously not reported site of primary infection of CLS in sugar beet is described. Fourteen day-old sugar beet seedlings were immersed with their roots in conidial suspensions ( $10^5$  spores/ml) of *C. beticola* for 2 days. Control seedlings were immersed in tap water for 2 days. After infection, the seedlings were potted in a peat-fine river sand mixture (1:9). In experiment 1, isolate code IRS 00-4 (Toldijk, The Netherlands) was used for root infection. Potted seedlings were placed at low relative humidity (RH) (RH < 80%) or at high RH (RH = 100%) in the greenhouse. Ninety percent disease incidence developed at high RH, and 25% disease incidence at low RH, whereas no disease symptoms developed in the control seedlings twelve days after incubation. CLS symptoms developed on cotyledons, leaves, petioles and stem of the seedlings. In experiment 2, isolate code IRS 00-2 (Veendam, The Netherlands) was used for root infection. Seedlings were placed at high RH in the greenhouse. One-hundred percent disease incidence was observed in the treated seedlings, and one leaf with CLS in the control treatment, 34 days after incubation. Not all infected seedlings showed symptoms, which can be due to sub-optimal climate conditions during the experiment. Future research therefore will focus on detection of *C. beticola* in sugar beet plants without CLS symptoms using molecular techniques. Using these techniques, CLS could then not only be detected in beet plants used in climate room experiments, but also in beet plants collected from the field e.g. within 2 months after sowing. In this study we showed that it is possible to obtain CLS symptoms in sugar beet seedlings when their roots were immersed in conidial suspensions of *C. beticola*. If sugar beet roots are the primary site of infection for CLS in the field, novel breeding strategies for resistance and controlling the disease can be developed.