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Fusarium in Lisianthus cultivation

Lisianthus is one of the important ornamental crops in Dutch greenhouses. Problems with Fusarium in this crop are not new. In the early 2000's the cultivation was affected by *Fusarium avenaceum*. In 2018 *Fusarium oxysporum* fsp. *eustomae* was identified as an important pathogen during a survey of *Fusarium* problems in the greenhouses. Recently, *Fusarium solani* seems to be the main culprit.

Lisianthus is a soil based cultivation, which makes it all the more difficult to get rid of *Fusarium* once it establishes in the soil. It can survive in soil as chlamydospres, which are extremely difficult to eradicate.

Soil steaming between the cultivation cycles is often used by the growers to prevent the spread of the pathogen. It is a very costly management practice. Moreover, it is not always sufficient to prevent the disease. *Fusarium* pathogens are becoming also increasingly resistant to chemical plant protection. Additionally, the availability of the chemical products allowed to be used in the cultivation is also relatively limited. Therefore an alternative management strategies are urgently needed.

Resistant plant material, if available, together with hygiene protocols are the basis of the integrated approach to prevention of *Fusarium* disease. In greenhouse bioassays we have shown that it is also possible to (partially) suppress the pathogen by manipulating the soil microbiome and/or addition of antagonistic microorganism, for example present in biofungicides. Manipulation of natural soil microbiome with addition of specific organic amendments, such as composts, seem to have more robust effect on Fusarium infection. Some biofungicides, used as stand- alone or in combinations, are also effective against this pathogen. However, it remains to be seen to which extend these management strategies can be effective against *Fusarium* in the greenhouse cultivation in practice.