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Ann-Charlotte Wallenhammar
Maria Algerin

Rural Economy and Agricultural Society, Örebro, Sweden

Detection of ascospore release of Sclerotinia sclerotiorum with real time PCR an important tool in understanding disease development in winter OSR

Sclerotinia stem rot, caused by Sclerotinia sclerotiorum (Lib.) de Bary, has been a major disease of spring oilseed rape (OSR) in Sweden. In recent years severe outbreaks were frequently reported in winter OSR south and south central Sweden. The objectives of this study were to increase our knowledge to understand disease development in individual fields of winter OSR by using quantitative detection of S. Sclerotiorum DNA on leaves of winter OSR and in air samples, and by determining the occurrence of infected plants in a region in south central Sweden where winter OSR previously rarely was grown.Ten fields were selected each year and early in May, at budding stage, sampling areas most commonly 24 meters x 100 m were selected. Leaves were collected at BCCH 63 in fields of winter OSR during four seasons from 2015 to 2018. The. From ten randomly selected plants the bottom leaves were detached. Air samples were collected by a Burkard 7-day continuously recording spore sampler placed within the sampling area in one of the fields. Air was sampled continuously from early May to early July. Disease incidence was determined in the sampling area in early July. Disease severity was assessed and a disease severity index calculated.

DNA extraction and qPCR analyses were performed according to a developed protocol.

In 2015 and 2016 the incidence of stem rot was equal to or above 15% in five out of ten and nine out of ten winter OSR fields, respectively. The highest infection level was 62 %, assessed in 2016, whereas no Sclerotina stem rot occurred in 2018. Analyses from the spore trap showed that S. sclerotioum DNA was detected in the air from the beginning of May until the beginning of July. The obtained qPCR data in combination with stem rot incidence and climate data are being employed in the development of a computational prediction model that could potentially be used to improve disease risk assessment. .