
Session 3

Epidemiology and pathogenicity of *Sclerotinia sclerotiorum* in oilseed rape: Overview of SkleroPro project

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The cooperative project "ValiProg", which is headed by Central Institute for Decision Support Systems in Crop Protection (ZEPP), is concerned with the fundamental validation and new development of decision support systems in agriculture. Prediction models have to be checked and optimized regularly for actuality and accuracy. The goal of decision support system is the reduction of chemical pesticides, which can be realized by accurate forecasts. In the subproject "SkleroPro", the forecast model of *Sclerotinia sclerotiorum* in oilseed rape is revalidated and adapted to the changed conditions. The model specifically calculates the importance of the *S. sclerotiorum* treatment during oilseed rape flowering. The cost of fungicide application and expected yield losses are included in the calculation. The model is available on the website www.isip.de.

The pathogen *S. sclerotiorum* is a soil-borne fungus that can persist in the soil for several years by means of sclerotia (permanent bodies). As the sclerotia germinate, apothecia (fruiting bodies) are formed, which produce ascospores. These infect the petals of the oilseed rape crops. During flower senescence, the infected petals fall into the leaf axils where the fungus infects the plant under favourable weather conditions. The difficulty of the pathogen management lies in the delayed formation of symptoms. Once symptoms are visible, it is too late for control.

To revalidate and optimize the "SkleroPro" forecasting model, two trials were conducted at the Julius Kühn-Institute (JKI) in Braunschweig in 2020. To investigate the relationship between *Sclerotinia*-infestation and yield losses, the winter oilseed rape cv. Avatar was artificially inoculated with different amounts of fungal inoculums at flowering stage (BBCH 65). Disease incidence and severity was assessed at BBCH 81-83 and correlated with crop yields after harvest. Symptom severity was dependent on inoculum levels, plant moisture and air temperature. There was a significant difference in disease severity between the untreated control and inoculated plots. Moreover, the economic and biological control thresholds of the model were investigated in two further field trials. It was shown that a fungicide treatment was not economical in 2020. Furthermore, to improve risk assessment, sclerotia depots were established in autumn 2020. At four locations on JKI campus, 100 sclerotia were buried at 3-5 cm depth, which weekly have been assessed. The depots will remain for 3 years without soil cultivation. The germination rate of sclerotia will be determined per year. In addition, the effect of temperature, light intensity, and relative air and soil moisture on sclerotia germination will be studied under controlled conditions.

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