

Potential of seed transmission of *Verticillium longisporum* in oilseed rape (*Brassica napus* L.)

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Verticillium longisporum is a soil-borne vascular fungal pathogen, which has spread throughout the European oilseed rape cultivation area and recently reached canola fields in Canada. In present study a series of greenhouse and field inoculation experiments using resistant and susceptible cultivars of winter and spring type oilseed rape were conducted to investigate the potential of transmission of *V. longisporum* by seeds of oilseed rape. The identity of the pathogen re-isolated from seeds of greenhouse grown diseased plants was confirmed using a DsRed labeled *V. longisporum* isolate. The fungal colonization from roots to hypocotyls, pods and seeds of diseased plants was further verified by species-specific qPCR. Frequency of recovery of viable colonies of *V. longisporum* from seeds harvested from greenhouse grown diseased plants ranged from 0.08 to 13.3%. Incidence of

seed transmission was higher in the susceptible than in the moderately resistant oilseed rape cultivar. Subsequent studies on transmission of the disease into the offspring revealed that only 1.7 to 2.3% of plants showed disease symptoms as confirmed by the formation of microsclerotia in the stems. Different to greenhouse, although low level of *V. longisporum* DNA was found in seeds of both field grown diseased winter and spring oilseed rape, viable *V. longisporum* colonies only yielded from seeds of the spring type but not from winter type plants. Equally, none of these seeds transmit the disease into the offspring. These results strongly suggest that the rate and probability of seed transmission of *V. longisporum* depends on the speed of plant colonization which is significantly faster under greenhouse conditions and in a spring-sown crop compared to autumn-sown oilseed rape.