

Validation of methods/protocols for routine detection and quantification of *Spongospora subterranea* in field soils and in production and storage facilities

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Spongospora subterranean f. sp. *subterranea* (Sss) produces durable resting spores that can survive in soil for many years. Sporosori can also be transmitted on infected seed tubers, infested growing substrates, and contaminated farm equipment. Powdery scab is not a major disease in France, but occasional infections may occur in potato plants grown in infested soils or substrates (mainly peat), and strict preventive measures are taken to avoid dissemination of Sss. During recent years, a set of detection and quantification tools have been developed and used to detect and monitor Sss in epidemiological studies. Reliability of these tools for routine preventative detection of Sss has been assessed in: 1) soils of different textures from regions where seed potatoes are grown in France; and 2) different production operations where first seed generations have been grown and stored. For reliable field detection of Sss, eight soils with different textures were collected from seed potato fields in different geographical areas. For detection of Sss in greenhouses, dust was collected using a swab method. Distinct swabs and different DNA extraction kits were used to optimize detection. Protocols for detection of Sss in water were also assessed, using different membranes and filters, and different DNA extraction kits. Detection sensitivity was compared for the different protocols using real-time PCR. The best protocols were selected and tested for the detection of Sss in samples collected from fields, greenhouses, or potato storage facilities. DNA extraction from soil was automated using a platform allowing DNA extraction from up to 380 samples. This is useful for routine detections, and this extraction system will soon be assessed for other substrates.