

## Powdery Scab in South Africa: What's New?

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Research on powdery scab on potatoes in South Africa is in its infancy. The disease has increased in intensity in South Africa over the past decade and has now reached epidemic proportions in some growing regions. Research has thus focussed on determining risk factors for disease development in South Africa.

The susceptibility of five crops planted in rotation with potatoes in South Africa; cabbage (cv. Copenhagen market), mustard (cvs. Florida Broadleaf and Southern Giant Curled), soybean (cv. PAN737R), wheat (cv. SST882) and tomato (cv. Rodade); to *Spongospora subterranea* subsp. *subterranea* (Sss) was determined. Results showed that Sss zoospores infected cabbage, both mustard cultivars, wheat and tomato 14 days after inoculation. Soybean was not a host for Sss. Galls containing sporeballs were observed in the roots of tomato and both mustard cultivars, indicating that the pathogen completes its life cycle in these hosts. Wheat and cabbage may be used as trap/decoy crops as the pathogen is unable to complete its life cycle within these hosts, thus reducing Sss inoculum in the soil.

A pilot pot trial was conducted to determine the relative levels of susceptibility of six cultivars widely planted in South Africa to powdery scab. The cultivars evaluated were Argos, BP1, BP13, Caren, Up-to-Date and Valor. Results showed no significant differences between powdery scab severity on tubers or root galling between cultivars.

In another study, Sss samples from potato growing regions in South Africa were collected, sequenced and analysed to investigate genetic variation. Comparisons with known Sss ITS Group Type I/II sequences were made to determine the specific Group Type/s found in South Africa as well as their phylogenetic position within the Plasmodiophorids. Tubers with Sss lesions were collected between 2008 and 2010 from four potato growing areas in South Africa. Dried tuber skins with Sss lesions from the Sandveld, dated 1936, were also obtained. Tuber lesions were removed and ground using a mortar and pestle and the powdery mass of sporeballs was used for DNA extraction and sequencing. Neighbour-joining (obtained using Kimura's 2-parameter distances) and Maximum parsimony trees were used to determine genetic variability of samples. South African samples grouped together along with known Sss Group Type II isolates. Isolates from South Africa formed a monophyletic group with other species from Plasmodiophorids. Long-term sampling from South African fields contaminated with Sss may indicate the presence of Sss subgroups which will be of importance for future resistance breeding programs.

The current research focus is on the development of sustainable, integrated management strategies for powdery scab.