Spongospora diseases of potato; current knowledge and prospects for effective management

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Spongospora subterranea (*Plasmodiophorida*, *Protozoa*) was first described as a potato pathogen in 1842[a], although powdery scab of potatoes was probably known long before. This pathogen and host most likely originated in northern South America, but *S. subterranea* has since disseminated to most potato-producing countries[b, c]. The pathogen causes potato root hair infections, root galls and tuber lesions, and vectors *Potato mop-top virus*, all of which can harm crop productivity. Host resistance is the best strategy for Spongospora disease control. Appropriate crop management practices can reduce effects of the pathogen[c], including:

- pre-planting (long *Solanum*-free crop rotations, field choice, fertilizers, soilborne pathogen tests, potato processing effluent disposal, planting date);
- at planting (*Spongospora* resistant cultivars, disease-free seed tubers, soil and seed tuber pesticide treatments, organic amendments);
- during crop growth (fertilizers, irrigation management).

Future research and technology transfer should involve[c]:

- implementing practical integrated disease management for potato producers;
- increasing knowledge of *Spongospora* genetics, and host/pathogen/environment interactions;
- identifying markers to assist potato breeding for *Spongospora* resistance;
- optimising mass screening to identify resistant *Solanum* germplasm;
- developing potato cultivars with resistance to Spongospora diseases.

[a] Wallroth RW (1842). Der Knollenbrand der Kartoffel. *Linnaea. Ein journal für die Botanik in ihrem ganzen Umfang* **16**: 332.
[b] Gau RD, *et al*. (2013). Global genetics and invasion history of the potato powdery scab pathogen, *Spongospora subterranea* f.sp. *subterranea*. *PLoS ONE* **8**(6): e67944.
[c] Strydom RF, *et al.* (2024). Advancements in *Spongospora subterranea*: current knowledge, management strategies, and research gaps. *Potato Research*: https://doi.org/10.1007/s11540-024-09701-8.