#20 Topic: Soft rot in potato crops. Can complex systems approaches help to reduce disease incidence?

Leading researcher: Dr. ir. Johannes Ransijn

Abstract:

Plant pathogens can be a serious threat to food production systems and food security. Pectinolytic Pectobacterium and Dickeya species cause softrot and blackleg in potato. Estimated economic damage in the Netherlands alone is already in the range of millions of euros. Pectobacterium and Dickeya are examples of cooperative bacteria that attack target tissue by means of coordinated collective action involving quorum sensing. The potato soft-rot disease system is a complex system with multiple hierarchical levels from cell to landscape scale. However, the potential power of epidemiological and complex systems approaches has hardly been used for investigating this system. We are only beginning to apply methodologies developed for plant, human and veterinary epidemiology on the extensive data from routine phytosanitary surveys from the Dutch seed potato certification programme.
I would like to introduce you to the potato soft-rot disease system, which can be an interesting model system for complex systems researchers, and explore the potential of 'complex system approaches' for understanding and managing this system. The subject has a natural science component related to, for example, epidemiology, eco-evolutionary dynamics and dispersal networks. Disease management also contains a social science component related to, for example, organisation for collective action by different stakeholders.