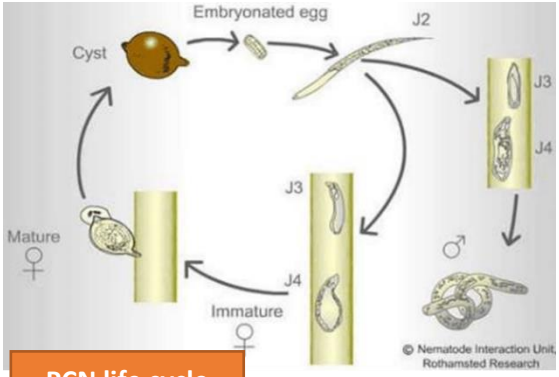
Master thesis BIOVIT 2021/22

Topic/Title (Norwegian)
Damping av PCN (*Globodera* spp.) i jord fra potetindustri

Topic/Title (English)
Evaluating soil steam sterilisation for eradicating PCN (potato cyst nematodes *Globodera* spp.) in soil waste from potato packaging industry.

Foto: PCN patch in potato field



PCN life cycle

Summary (Describe the topic/thesis, type of thesis work: field work, laboratory work, literature study)
Potato cyst nematodes (PCN, *Globodera* spp.) are destructive pests in potato production and are classified as quarantine pests in over 100 countries. PCN have a narrow host range, spesialising on solanaceous crops, in which potato are most affected. The PCN cysts are hardy and long-lived surviving over 30 years in soil without a host. Each cyst contains 300 – 600 eggs, triggered to hatch only in the presence of solanaceous (potato) root exudates (PCN hatching factors). The emerging juveniles locate and invade the host roots, develop into females (or short-lived males) and new cysts are formed completing the life cycle within a cropping season. Root invasion of the nematodes cause damage to the plant by inhibiting water and nutrient uptake, leading to stunted growth and reduced tuber production. PCN may cause over 80% yield loss in potato if left unchecked, but more importantly once a field is infested, they are impossible to eradicate hence these pests are under strict quarantine regulations. The Norwegian Food Safety Authority also imposes strict regulations to prevent the spread of PCN from contaminated potatoes/potato seed, soil, or potato waste.

This thesis is valuable in determining if soil waste from the potato packaging industry, that may be contaminated with PCN cysts, can be treated with soil steam to eradicate/destroy any cysts present. The outcome of the thesis will be of value to the industry if steam treated soil can be declared free of PCN.

The work will involve a literature review on PCN and current eradication methods, laboratory studies to test different soil steam temperatures and time of exposure to PCN cysts, aiming to determine the threshold time and temperature necessary to destroy the eggs/juveniles in PCN cysts.

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Subject area (keywords)
Potato cyst nematodes, PCN, *Globodera* spp., soil steam, survival, potato, potato industry.

Language thesis (Norwegian and/or English)
English

Bachelor or Master thesis
Master

Credits
60 credits

Project/company
NIBIO and Soil Steam International AS

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