

Zysten anderer Nematodenarten. Insgesamt wurden 821 mikroskopische Differenzierungen durchgeführt. Dabei waren 99 Prozent (n=812) richtig.

Selektivität

Bei der Selektivitätsprüfung wurde die Methode mit drei verschiedenen Bodenarten Löß, Lößlehm, lehmiger Sand geprüft. Bei reinem Löß wurden 95% (n=40) richtige Ergebnisse erzeugt, bei Lößlehm 99% (n=102) und bei lehmigem Sand 100% (n=99).

Wiederholpräzision

Die Prüfung der Wiederholbarkeit erfolgte an der Nachweisgrenze mit einer Zyste je Bodenprobe als niedrigsten möglichen Belastungsgrad. Die Wiederholbarkeit wurde durch drei Personen und separat für drei Trägermatrices geprüft. Stets wurden acht Wiederholungen unter Berücksichtigung folgender gleichbleibender Bedingungen geprüft:

Messmethode; Mitarbeiter bzw. gleiche Mitarbeiter-Paarung (Arbeitsschritt 1: Flotation mit MEKU und Arbeitsschritt 2: Mikroskopie wurde praxisbezogen von zwei verschiedenen Mitarbeitern ausgeführt; Messinstrument; Ort; Versuchsbedingungen; Arbeitstag.

Reproduzierbarkeit (Vergleichspräzision)

Zur Bewertung der Reproduzierbarkeit oder auch Laborpräzision oder Vergleichspräzision genannt, haben drei Personen die einzelnen Arbeitsschritte jeweils getrennt durchgeführt.

A) zu verschiedenen Terminen

B) verschiedene Mitarbeiter bei der Bedienung des MEKU-Bodenextraktors

C) verschiedene Mitarbeiter bei der Mikroskopie

Es wurden keine falsch positiven Ergebnisse, oder zu viele Nematodenzysten detektiert.

Lediglich ein Mitarbeiter konnte in drei Fällen nicht alle Nematodenzysten wiederfinden.

Die Validierung ergab, dass das installierte Prüfverfahren eine sichere Extraktion von Kartoffelzysten nematoden im Sinne der EPPO PM 7/98 (1) aus Bodenproben ermöglicht. Regelmäßige Laborvergleichsuntersuchungen (Ringtest) sind für eine dauerhafte Aufrechterhaltung des erreichten Qualitätsstandards erforderlich.

Literatur

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169 - Influence of *Beauveria bassiana* on potato tuber damage and reproduction potential of *D. destructor* and *D. dipsaci*

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Beauveria bassiana is a cosmopolitan fungus, occurring in soils and occasionally as an endophyte in plants. Commercial biological insecticides from specific isolates of *B. bassiana* have been developed for the control of pests including the potato tuber moth, potato colorado beetle and nematodes. Potato tuber rot nematode (*Ditylenchus destructor*) and stem nematode (*D. dipsaci*), cause damage to potato tubers leading to economic losses. These nematode species are also polyphagous feeding on numerous fungal species. In this study, it was hypothesised that a complex

interrelationship occurs when *B. bassiana*, *D. destructor*, *D. dipsaci* and potato plants occur together, especially where *B. bassiana* is used as a bio-control agent against other pests. Two independent greenhouse experiments were conducted to investigate the influence of *B. bassiana* (isolate: Naturalis) on the damage potential and reproduction factors of *D. destructor* and *D. dipsaci* on potatoes. One potato tuber was planted per pot (700 cm³) and the surrounding soil drenched with 10ml *B. bassiana* (isolate: Naturalis; concentration- 5x10 conidia ml⁻¹). Two weeks later, plants were challenged with 2000 nematodes per pot. The experiments were laid out in a complete randomised design, replicated 8 and 10 times for experiment 1 and 2, respectively. The duration of the experiments was 12 and 16 weeks, respectively. In experiment 1, aboveground plant fresh and dry weights were not influenced by any treatments ($P > 0.05$). However, tuber numbers and weight were significantly reduced ($P < 0.05$) by the presence of nematodes or the combination of *B. bassiana* and nematodes. In the absence of nematodes, *B. bassiana* treatments had no influence on potato tuber weight. Nematode reproduction factors were significantly $P < 0.01$ higher in the presence of *B. bassiana*. An increase in the duration of experiment during experiment 2 led to increased damage caused by the nematodes. Tuber numbers and weights differed significantly among the treatments. Tuber damage and nematode reproduction factors were higher, when both *B. bassiana* and nematodes were present, compared to treatments with nematodes alone. However, in the presence of *B. bassiana*, the number of *D. destructor* juveniles and *D. dipsaci* females were significantly reduced. Although *B. bassiana* is an effective bio-control agent against some nematodes, its occurrence together with *D. destructor* and *D. dipsaci* in the presence of potato plants result in an increase in potato tuber damage caused by *D. destructor* and *D. dipsaci*.

170 - Characterization of *Heterodera schachtii* populations

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The beet cyst nematode *Heterodera schachtii* (BCN) is a major problem in sugar beet production in Germany. Although resistant mustard and oil seed radish varieties are in use for decades, there is little information on the genetic variability of BCN populations. Since sugar beet varieties with resistance or tolerance to BCN have been introduced recently, this aspect is of increasing relevance. Twelve populations collected from different sites in North Rhine – Westphalia and Lower Saxonia in Germany, and one isolate from Jordan were characterized morphologically, molecularly, and in terms of their virulence. Results showed that the German populations varied in their virulence on several mustard and radish cultivars. The Jordanian population was very virulent on cauliflower cultivars. Three populations were used to inoculate *Arabidopsis* growing on in vitro culture to test whether the differences of the virulence will follow that same pattern under these conditions. The results have shown that the populations have shown the same pattern of virulence (Fig. 1). The characterization of the populations is an important step in analyzing the genetic variability of BCN populations and their relevance in resistance management in sugar beet production.