

analysis of viral infection of tubers at harvest. To use Real Time PCR as a diagnostic tool it is necessary to determine if the two techniques give comparable results on batches of field-grown potatoes. Such a test was performed on potential seed tuber lots for three successive spring harvests. The results show that at a low PVY infection rate (suitable for seed tubers) there is a reasonable agreement between the techniques. However, at higher levels of PVY infection, which are anyway unsuitable as seed, there is not a good agreement between the techniques. Real Time PCR is appropriate for the determination of PVY infection in potential seed tubers in Israel.

EPIDEMIOLOGY AND CONTROL MEASURES

An integrated system approach for the management of root knot nematodes in greenhouse production of pepper crops

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The Israeli pepper crop is grown intensively in closed structures (plastic and net houses), and for export of high quality fruits. The plants are susceptible to root knot nematodes and pathogenic fungi which dwell in deep soil layers. Therefore, it is a challenging task to control nematodes and other soil-borne pests to ensure a productive and healthy crop. The objectives of this study were to develop a nematode control approach which is integrated with measures such as sanitation and special crop fertigation. Two field experiments were carried out in plastic- and net-houses for pepper production which were heavily infested with *Meloidogyne incognita*. Each experiment was for a period of two years. Each experiment was designed with three levels of treatments, including soil disinfestation, root destruction and crop fertigation. At the end of the previous pepper crop 1,3 dichloropropene (1,3D) was applied to the plots to kill the roots and prevent the establishment of a new generation of nematodes. Soil disinfestation using combination of 1,3D or dimethyl disulfide (as Paladin) and solarization was applied during the summer. The combination of sanitation (root destruction) at the end of the previous crop together with soil disinfestation and specific fertigation reduced the number of nematode eggs in the soil to negligible levels. Fertigation with a phosphate/nitrogen based formula was applied periodically to improve the tolerance of the plants to nematode infection during the crop season. During the crop production we did not observe any damage from nematode infection in the treated plots. Root analysis at the end of the crop season indicated zero infection by nematodes in one experiment and a low rate of infection in the second. This study indicates that control of root knot nematodes in intensive crops requires concerted action of various measures within the production system, which benefits crop production and are detrimental to the pathogen.

Observations regarding the primary inoculum source of *Phytophthora infestans* in potato and tomato fields and the spread of the disease in Israel

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Late blight, caused by *Phytophthora infestans*, is one of the most important diseases of potatoes and tomatoes in Israel and worldwide. Although the epidemiology and management of late blight have been studied in Israel for more than 50 years, it is still not clear what are the main sources of primary inoculum in both crops. The objectives of this study were: (i) to characterize the *P. infestans* genotypes prevailing in Israel, and (ii) to document the spatial and temporal onset of late blight symptoms around the country. The genotype of 41 *P. infestans* isolates sampled from potato and tomato crops in the 2013-14 autumn seasons, 2014 spring season and the 2014-15 autumn seasons was characterized. All isolates were categorized as belonging to the US-23 clonal lineage, suggesting that infected potato seeds imported from European countries, did not serve as the source of initial inoculum in local production areas. Based on data recorded in 2014-15 we hypothesized that late blight epidemics in that year originated in the northwestern Negev (where host crops are grown year-round) from which the pathogen sequentially spread to other production areas of the country.

Control of Fusarium wilt in summer lettuce by sanitation and pre-planting soil fumigation

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Fusarium wilt caused by the soil borne fungus *Fusarium oxysporum* is one of the major diseases of lettuce, with highest incidence during summer when high soil temperatures prevail. Disease symptoms include chlorosis and wilt, brown discoloration of the vascular bundles, root rot and eventually plant death. The common practice in lettuce cultivation of incorporating plant residues into the soil causes an increase in soil borne inoculum. Therefore soil fumigation, mainly by metam sodium (MS) is frequently applied through the irrigation system prior to planting. However, MS fumigation has high costs, negatively affects the environment and its efficiency is inconsistent due to accelerated biodegradation. The objectives of the current study were to evaluate the effect of lettuce residue sanitation (chemical and