א. אנאליזה של הפחתת מחלות והגדלת יבולים ע"י חיטוי סולארי

Meta-analysis of disease reduction and yield increase by soil solarization and its combinations

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Soil solarization is a non-chemical method of using solar heating for managing a wide range of soilborne pests. Numerous studies have been performed since 1976 to examine and validate its potential and efficacy. The phaseout of Methyl Bromide (MB) has boosted the use of solarization alone and in combination with other measures, such as soil fumigants, nematicides, biological agents or organic amendments. Meta-analysis refers to methods used for amalgamating results from different studies for identifying general trends of effects, analyzing sources of disagreement among studies, and suggesting explanations for failures. Meta-analyses approaches can also illuminate other interesting relationships in the context of multiple studies. The aim of the current study was to employ meta-analysis tools for examining the general effects of solarization as opposed to analyses based on separated studies, under a specific set of conditions. In a preliminary examination we analyzed 41 documented experiments, and found that soil solarization reduced disease intensity significantly in 78% of the cases, as compared with the control treatment; in 69% of the experiments yield was significantly increased. The respective percentages for solarization combined with other control methods were 97% and 95%, respectively. Correlations between disease severity and disinfestation efficacy for solarization and combinations of solarization with other control measures were calculated for two pathogens as a test case. At a later stage, the entire documented and relevant data for soilborne pathogens will be analyzed. Attempts will be also made to identify the reasons for certain cases of reduced effectiveness in soil solarization.

ב. דינאמיקה של החיידק "ריקציה" בחרקים מזיקים

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INVERTEBRATE MICROBIOLOGY

Dynamics of the Endosymbiont *Rickettsia* in an Insect Pest

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Abstract A new heritable bacterial association can bring a fresh set of molecular capabilities, providing an insect host with an almost instantaneous genome extension. Increasingly acknowledged as agents of rapid evolution, inherited microbes remain underappreciated players in pest management programs. A *Rickettsia* bacterium was tracked sweeping through populations of an invasive whitefly provisionally described as the "B" or "MEAM1" of the *Bemisia tabaci* species complex, in the southwestern USA. In this population, *Rickettsia* provides strong fitness benefits and distorts whitefly sex ratios under laboratory conditions. In contrast, whiteflies in Israel show few apparent fitness benefits from *Rickettsia* under laboratory conditions, only slightly decreasing development time. A survey of *B. tabaci* B samples revealed the distribution of *Rickettsia* across the cotton-growing regions of Israel and the USA. Thirteen sites from Israel and 22 sites from the USA were sampled. Across the USA, *Rickettsia* frequencies were heterogeneous among regions, but were generally very high, whereas in Israel, the infection rates were lower and declining. The distinct outcomes of *Rickettsia* infection in these two countries conform to previously reported phenotypic differences. Intermediate frequencies in some areas in both countries may indicate a cost to infection in certain environments or that the frequencies are in flux. This suggests underlying geographic differences in the interactions between bacterial symbionts and this serious agricultural pest.

Keywords Whitefly · *Bemisia tabaci* · Middle East-Asia Minor 1 (MEAM1) · *Bemisia argentifolii* · B biotype · Diagnostic PCR