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An observation for the control of red spider mites in cucumbers Using Oils

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Introduction:

Red spider mites (*Tetranychus urticae*) are considered as a major pest in cucumbers in greenhouses. The effectiveness of the chemical pesticides against this insecticide has been decreasing over the years as a result of the development of resistance against them. Over the years, the possibility of integrated biological pest control has also been tested using predatory mites, but as of now it has been unsuccessful.

GrowSafe, which is an emulsion of vegetable oils (produced by agro-Shelef) has recently entered the market. It is important to note that oils in general are used as physical toxins that block the airways of the mite so that there is no danger of developing resistance against them and they can even be integrated into a biological control system integrated with the cultivation.

In this observation, we would like to examine the **efficacy of GrowSafe in comparison with the treatment of mineral oil (JMS) and chemical treatment.**

Methods and Materials:

The observation point was conducted in a cucumber greenhouse in Moshav Achituv. Planting date 17/7/2013, strain 2232 variety.

The application of the products was done using a portable independent sprayer with air blower (Chico, Degania) with a spray volume of 60 liters per dunam.
The size of each the observation plot: 250 sq/meters.

The spraying applications began with the first incidence of mites in the plot, about three weeks from planting, on Aug 7, 2013, and were given ones every week and a total of 6 treatments, and the last treatment was given on Sept 11, 2013.

The chemical treatment was: Vertigo (Abamectin) at a dose of 150 ml/dunam, with the exception of one of the six treatments using Floramite at 50 ml/dunam.

Due to the increase of infestation in the treatment of JMS, in the last two spraying, the oil was combined with Vertigo (Abamectin) at a dose of 150 ml/dunam.

Application dates:

--Aug 7, 2013 -- Aug 15,2013 -- Aug 22,2013 -- Aug 29, 2013 -- Sept 3,2013 -- Sept 11,2013



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List of treatments

1. JMS oil 1% (contains 97.2% mineral oil)
2. GrowSafe oil 3% (contains 60% vegetable oil)
3. Chemical (Vertigo 150 ml/dunam OR Floramite 50 ml/dunam)
4. JMS 1% + Vertigo 150 ml/dunam
5. GrowSafe 3% + Vertigo 150 ml/dunam

In each treatment plot, 25 leaves at a height of 1.5-2 meters from the ground were randomly sampled and all adult mites were counted.

Evaluations were performed several times during the growth period.

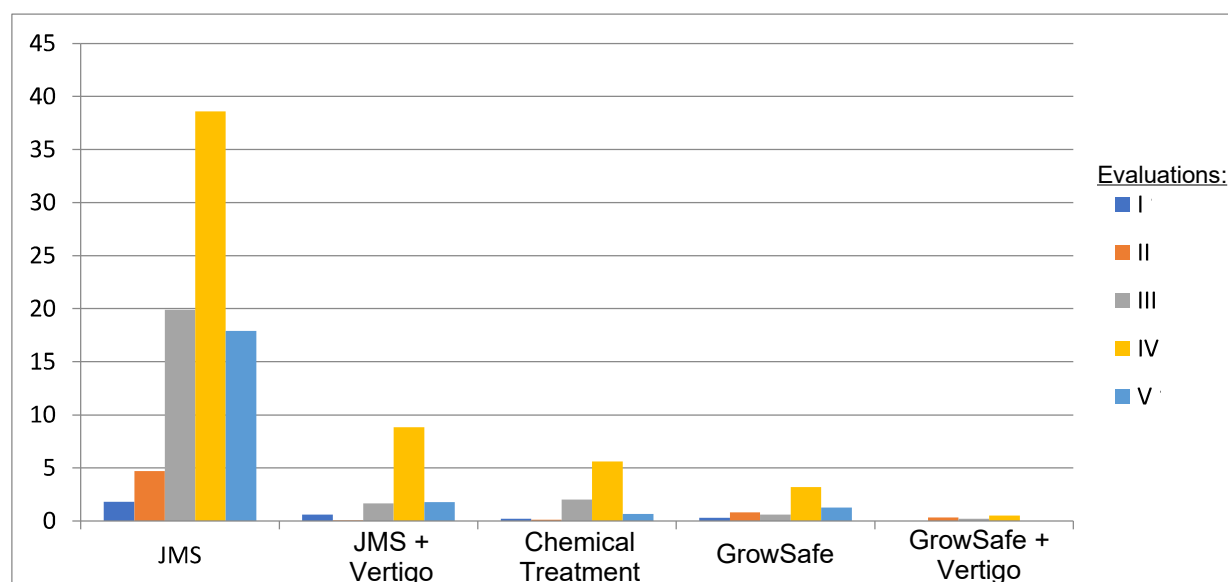
Results:

Table 1: Average number of adult spider-mites per leaf

Date/Treatment	Aug-20-2013	Aug-27-2013	Sep-2-2013	Sep-10-2013	Sept-17-2013
JMS*	1.8	4.7	19.9	38.6	17.9*
JMS+Vertigo	0.6	0.04	1.64	8.8	1.76
Chemical	0.2	0.12	2	5.6	0.64
GrowSafe	0.3	0.8	0.6	3.2	1.24
GrowSafe + Vertigo	0	0.32	0.2	0.5	0

*During the last two spraying intervals a chemical spray (vertigo) was combined with JMS

Graph 1 - Average number of adult spider-mites per leaf





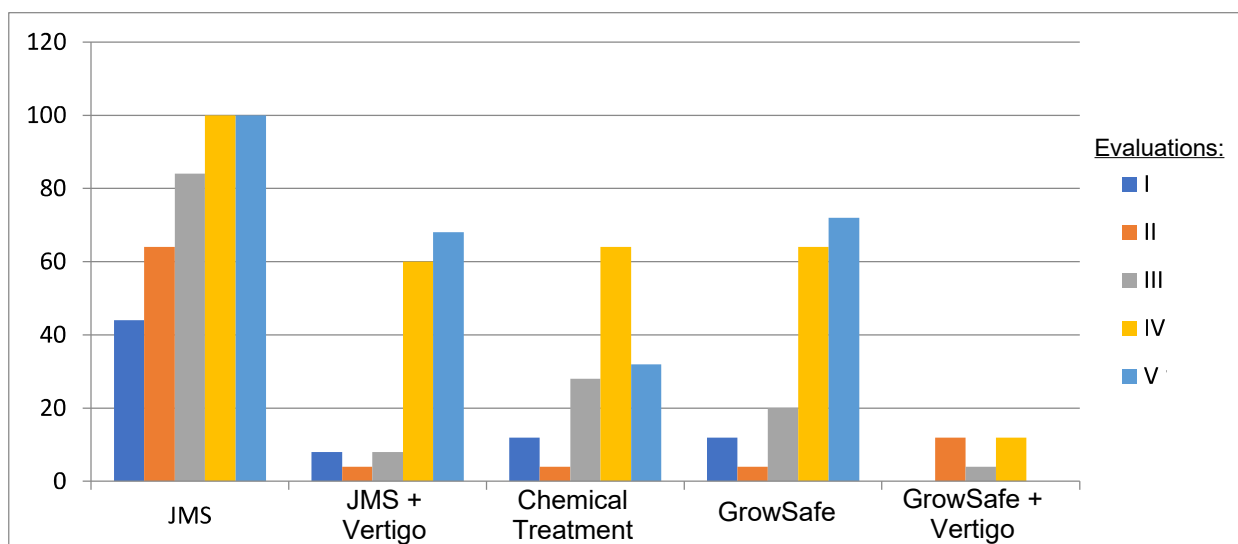
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As shown in Table 1 and Figure 1, the infestation level of spider mites kept low throughout the time of the observation - except in the JMS plot. The decrease of infestation in this treatment may be related to the addition of "vertigo" to the JMS plot in the last two applications. In this observation, the treatment of GrowSafe separately, and in combination with "Vertigo", maintained low spider-mite infestation rate throughout the season. In this observation, the chemical treatment based mainly on "Vertigo", which has been very "weak" in recent years, has been found to be effective, when it is applied on regular basis, from the beginning of the infestation. It should be noted that it is very important to use an air blower sprayer that exhibits a uniform and superb leaf coverage on both top and bottom sides of the leaf.

Table 2: Leaves infested with Adult Spider-Mites (Percent)



* In the last two spraying JMS plot was also treated with "Vertigo"

As shown in Table 2 and Figure 2, it is clear that the percentage of the leaves infested with spider-mites has increased over time in all the treatments, except for the treatment of GrowSafe in combination with "Vertigo". In the JMS treatment, the percentage of infected leaves was 100% in the fourth count and in the JMS + chemical, chemical and GrowSafe treatments the percentage was not higher than 65%.



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Summary and Conclusions:

1. GrowSafe was effective in protecting the crop against red spider mites and kept the populations low during the entire growth.
2. JMS oil is found to be less effective.
3. The chemical treatment, which was mainly based on 150 mg / abamectin ("Vertigo") and applied weekly from the beginning of the infestation, was also effective.
4. The combination of chemical treatment with GrowSafe or JMS improved the results.
5. It is important to note that the use of a sprayer with air blower which provide good coverage of the leaves is very significant in these results.
6. Following these results and additional impressions from the growers, GrowSafe will continue its testing of additional cucumbers and experiments.