

Summary sheet

SUMMER OILS USE FOR SPIDER MITES CONTROL IN ORNAMENTAL NURSERY CROPS Émilie Lemaire, MSc, Agrm., Marie-Claude Lavoie, BSc (biol), Agrm.

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HIGHLIGHTS

Mites are important pests in ornamental nursery and need repeated miticide applications that could affect natural enemies and other beneficial organisms. Since few years, high purity horticultural oils are available and registered for summer use on ornamental plants. However, there are some interrogation about their efficiency and risk of phytotoxicity. A two years study was done to clarify 1- efficiency and 2- the phytotoxicity, of the product. The trials confirmed that summer oil can be as efficient as a miticide and even more. On the other side, the miticides shown varying efficiency between the two years. Oil acts with different mode of action so there is a low risk that this pest develops resistance. The tests have allowed to confirm that the oil is an efficient product and more interesting for a long term strategy compared with many other miticides. The oil is a contact product and has no residual effect. It must therefore correctly reaches the pest to be effective. The results of the project show that, in some cases, one or two applications of summer oil are insufficient and that it is preferable to repeat it within 7 to 10 days to maintain the mites population at a low level. While at others moments, especially when there are natural enemies, a single application can be sufficient. After summer oil applications on 72 cultivars of perennials, shrubs and trees, only 6 were shown signs of phytotoxicity: flecks on the foliage on 2 *Hemerocallis* cultivars and 2 of *Calamagrostis*, the disappearance of the waxiness that modified the appearance of the *Sedum spectabilis* 'Brillant' and brown spots on *Imperata cylindrica* 'Red Baron'. On the other hand, no phytotoxicity were observed on species for which warnings are mentioned on the product label: *Acer saccharum*, *Thuja* spp., *Juniperus* spp. Summer oil was found to be non-toxic to most species even when applied in direct sunlight at temperatures above 30°C.

OBJECTIVES AND METHODS

The specific objectives of this study were to evaluate the summer oil 1-efficiency against spider mites and 2- phytotoxicity on several ornamental species produced in the nursery. In the first year of the project, 5 treatments were compared: 1- Control (3 sprays of water); 2- Miticides (3 sprays); 3- Oil 1x (1 spray); 4- Oil 2x (2 sprays) and 5- Oil 3x (3 sprays). Treatment 3 (1x oil) was withdrawn from testing in the 2nd year. The treatments were repeated 4 times out of 3 plant species: *Sambucus canadensis*, *Hemerocallis* x hybrida and *Thuja occidentalis*. A non-destructive scouting was done before and after each spray. In phase 2, for the 2 years of the project, 4 treatments were compared and repeated 3 times of a total of 72 cultivars of perennials, shrubs and trees. The treatments were an application of summer oil and water (control) during a regular summer day (maximum 24°C) and on a warm day (30°C or more). Phytotoxicity was evaluated on the plants one week after treatment. The same methodology was repeated at two sites.

SIGNIFICANTS INDUSTRY RESULTS

The results of this two-year trials show that spray of summer oil could be even and more efficient than a miticide for two-spotted spider mite control. Figure 1 shows population density evolution of the mite on *Sambucus* on Site 1 at season 2. On the graph, the second oil application helped maintain a low population compared to a Shuttle miticide treatment for which the population was greater. Oil is a contact product without residual effect. A good foliage cover is necessary to ensure the contact of the product with the pest. More than once, like presented on figure 1, we observed at the end of the trial that the population density of spider mite was significantly higher on the plants that received only 2 oil applications than those who received 3. Indeed, following the cessation of spraying oil, the population density increases again (Oil 2x figure 1).

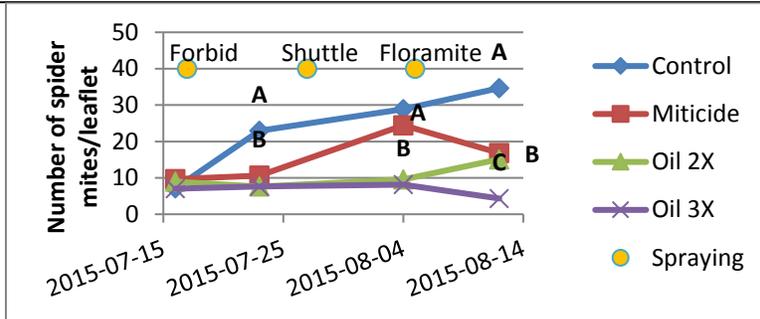


Figure 1.

In season 2, the sprays were made at closer intervals than season 1. On the 72 perennials, shrubs and trees cultivars tested, only 6 showed signs of phytotoxicity: flecks on foliage of *Hemerocallis x hybrida* 'Stella de Oro' and 'Texas Sunlight' and *Calamagrostis acutiflora* 'Karl Foerster' and 'Overdam'; brown spots on *Imperata cylindrica* 'Red Baron' and the disappearance of the wax aspect modified the color of *Sedum spectabilis* 'Brillant'. On the other hand, no phytotoxicity was observed on species for which warnings were mentioned on the product label: *Acer saccharum*, *Thuja* spp., *Juniperus* spp. The summer oil was nontoxic for the majority of species, even when applied in full sun at a temperature greater than 30°C.

APPLICATIONS POSSIBILITY FOR THE INDUSTRY AND/OR FLOW-UP

The results of the project over two years showed at 2 sites and on 3 plant species that a summer oil application can be as effective a miticide and even more. Since the summer oil acts on insects and mites with different modes of action, the risk that pests develop resistance is low. Thus, summer oils appear like efficient products and more advantageous in a long term strategy than conventional miticides. Its cost is comparable to the miticides cost and the production is easy to obtain making it very accessible to producers. On the majority of the tested plants, the oil did not cause any phytotoxicity. Producers could therefore use it repeatedly on many shrubs, trees and perennials and thus reduce the use of miticides.

Additional tests with higher densities of spruce spider mites should be done to confirm the effectiveness of the oil against this species. Its effectiveness should be validated for other pests, for example scale insects.

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