

CHEMICAL METHODS
IN AN INTEGRATED ACTION
AGAINST *EUPULVINARIA HYDRANGAEAE*
IN BELGIUM

(HOMOPTERA: COCCOIDEA: COCCIDAE)

(Summary)

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Abstract. Six contact insecticides were tested against *Pulvinaria hydrangeae* under laboratory conditions, and six systemic ones were applied at big trees by means of a prototype injector *commander system*.

Since 1980, a severe outbreak of soft scales (in fact a complex of 3 various introduced species) causes serious injuries, in particular by the defoliation of urban trees in the Region Bruxelloise (center of Belgium). Among them, *Eupulvinaria hydrangeae* Steinweden is the most noxious pest. As the number of plant species and new regions of our country colonized by the scale continuously increases, the situation becomes more and more worrying. Management of the pest must be adapted to the urban context, using two control methods: on one hand, pulverization of insecticides with very low human toxicities, and, on the other hand, systemic injections in the stem flow of the biggest trees.

Classical control method

The classical control method is spraying of insecticides effective against *E. hydrangeae*, but innocuous to man and to beneficial organisms, in particular the predator: a coccinellid, *Exochomus quadripustulatus* L.

Contact toxicities of 22 insecticides (10 O.P., 8 pyrethroids, 3 carbamates and 1 formamidine) were tested in a lab screening using severely infested maple branches. Finally, 6 of them were selected considering their efficiency, moderate toxicity and, in some case, possible harmlessness to auxiliaries: they were tested in 3 different stations submitted to natural conditions of infestation. Concentrations tested were equal to: 2 ml/l of ACTELLIC (EC 500g pyrimiphos-methyl/l), 1 ml/l of AMBUSH (EC 250g permethrin/l), 2ml/l of FOLITHION (EC 550g fenitrothion/l), 2g/l of MITAC (WP 50% amitraz), 2g/l of PIRIMOR (WG 50% pirimicarb) and 1 ml/l of TALSTAR (EC 100g bifenthrin/l). ACTELLIC, AMBUSH and MITAC appear to be more toxic than the other insecticides. As each of them comes from a different chemical family, their use in alternance could be a very effective treatment against *E. hydrangeae*.

Furthermore, we found in a laboratory experiment that one of them (MITAC) seems to be harmless to the natural predator: *E. quadripustulatus* L. This active ingredient could be used in an integrated pest management program against *E. hydrangeae*.

A particular method aimed at big trees

Injection of systemic insecticides in the trunk of big trees should provide a solution to the impossibility of spraying infested big trees in the city. Indeed, this method is completely harmless to man and, in most probably to auxiliaries.

For this application, a prototype injector, the "Commander System" (Birchmeir & Co Ltd) was used. Such a device integrates all tools needed for the treatment of the trees:

- the energy required is provided by CO₂ at high pressure, so that the active ingredient solution could be very quickly injected (at a 15 bars pressure);
- the form of the injection needle is designed for injecting the product into the trunk at the most appropriate depth for meeting the ascendant sapflow;
- the system does not require to bore holes into the trees and therefore causes a minimum injury to the tree tissues.

Six active ingredients (dicrotophos, methamidophos, monocrotophos, oxamyl, phosphamidon and vamidothion), selected for their water solubility properties, were tested in laboratory and field trials.

One of them, monocrotophos, gives interesting results against *E. hydrangeae*, especially on lime trees.

Nevertheless, some problems are not quite resolved yet:

- homogeneity of repartition of the infected produce in the canopy of the tree;
- optimum dosis of active ingredient per hole;
- long term examination of the injuries in the trunk caused by injections.

All of these topics are or will be investigated in our next trials.

