Development of a Pest Warning System to Reduce Chemical Use in Hardy Nursery Stock Production and by Professional Gardeners©

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INTRODUCTION

In Belgium a pest early warning system was introduced in 1996 by the extension service of the Belgian Ministry of Agriculture.

Its creation was prompted by the withdrawal from the market of several broad-spectrum pesticides and the growing environmental consciousness of both growers and their customers. The warning system meant that existing routine calendar-based treatments could be replaced by a more integrated pest management approach with selective pesticides and more attention paid to use of natural enemies. The aim of the system is reduced and more effective use of pesticides by limiting treatment to the moment in the lifecycle of a pest when it is most vulnerable. The number of treatments and thus the cost therefore decrease. The system is available to nurseries, garden contractors, and local authority parks and open spaces managers.

The service initially provided warning messages regarding five pest species. In 1997 operation of the warning system was transferred to the Research Centre for Ornamental Plants. At that time it was part of a 5-year project receiving financial support from the European Union, and the warning messages were free to growers. In 2001 the funding was finished and the system had to begin to charge a membership fee to cover its costs. This did not prevent uptake, and the system has developed further so that in 2006 it provides warnings about the activity of 50 pest species including insects, mites, and some fungal diseases.

THE BASIS OF THE WARNING SYSTEM

There are three major elements to the warning system. These are detailed below:

Observation. There are observation points in the four important nursery areas in the Flanders region of Belgium. Observation points include nurseries, gardens, and parks. Pest advisers using hand lenses carry out observations in the field, and plant samples are also collected for laboratory examination and diagnosis using microscopes and Berlese funnels. Samples placed in the Berlese funnel are exposed to heat and light, which makes any pests hidden within a sample escape. While migrating they fall into a small jar of preserving liquid (alcohol) and can then be removed and identified.

Warning. Warning messages are sent when we detect pests that are hatching or that are at another stage in the lifecycle when control measures are most effective. The messages contain information about the life cycle of the pest, a description of symptoms, and advice on treatment (including products and the dose that may be required). They are illustrated with pictures of symptoms to make recognition easier. Each message contains advice to check the plants for symptoms first. The message

is intended as an alert to encourage growers to go out and check their crops, not an instruction to apply treatments regardless of the presence or absence of the pest.

Education. To manage pests, growers must learn how to recognise them and understand something about their way of life. Therefore, an important element in the pest-warning programme is the provision of courses and practical sessions for users. Each year members of the scheme are sent a number of illustrated index cards containing information about pests and diseases and about the natural enemies that control them. The cards contain comprehensive information about the lifecycle of the species, each stage being described and illustrated with pictures. Diagrams of the lifecycle clearly show the stage when control measures are most effective.

Growers should also be aware that not everything they see crawling on their plants is harmful. Many organisms are very useful, so the warning scheme also promotes the creation of habitats for beneficial organisms, such as wild flower areas to harbour hoverflies and lacewings.

SOME PARASITES INCLUDED IN THE SYSTEM

Scale. Scales demonstrate the importance of observations and warnings. The best moment to control these pests is when the eggs hatch and the young larvae come out from under the mother's protective shield. During a short period these "crawlers" are mobile and shieldless, which makes them vulnerable to pesticides. The scales can't be reached for the rest of the year, except for a very short period in spring when they migrate to lay eggs. Some species of scales lay eggs outside the shield in white egg sacs. Scales are most obvious in spring, which is when people start to panic and want to spray, but at this stage treatments are useless.

Gall Mites. Because of their way of life, gall mites are one of the most difficult pests to control. Many species have a very complicated lifecycle. In general the migration period is the best time for control measures. The rest of the year they are protected by the galls of plant tissue. In the case of *Aceria unguiculata*, which occurs on boxwood, the plant does not produce closed galls, but the mites do cause heavy stunting of the upper shoots. As a result they are difficult to reach in the deformated leaves. They migrate to new shoots on warm sunny days. A warning message is sent in spring when the overwintering females migrate towards the upper shoots.

Spider Mites. It is important to control these pests as soon as possible in the season, while winter eggs are hatching. Delay of treatment can lead to permanent visual damage in the case of boxwood spidermite (*Eurytetranychus buxi*) or needle loss and even death in the case of conifer spinning mite (*Oligonychus ununguis*).

Plant Lice. Treatment when winter eggs are hatching is necessary to prevent large-scale infestations.

Vine Weevil (*Otiorhynchus sulcatus*). This can be controlled biologically by using nematodes in late summer to early autumn or spring. Field trials showed a good result for the spring application. Chemical treatment must be carried out when the adults hatch from the pupa in early summer.

SCHEME MEMBERSHIP

Our membership includes a number of services. Each member receives a folder to put the warning-messages and illustrated index cards in. We also send messages regarding recent developments in crop protection, correct and efficient use of products, and so on. Members can also phone us for advice. Samples can be sent for identification and advice given on treatment. There is also information available on our website with a part which is exclusive for members.