

An end to the game



Movento® is the new innovative insecticide from Bayer CropScience. It moves easily within the plant, allowing it to reach insect pests that have burrowed deeply into the plant's tissues. It is characterised by a broad and long-lasting efficacy, mainly against sucking insects. At the same time, Movento works hand-in-hand with beneficial arthropods and honey bees.

Crop protection products must work. This is a rather obvious statement – but it encapsulates the challenge that keeps thousands of researchers around the world occupied for entire careers. It isn't just a matter of rendering the pest harmless through contact with, or uptake of, the active substance: the active substance first

has to reach the pest. If insects are lodged deep inside plant tissues (for example in a lettuce heart or at the ends of roots), the challenge may be a considerable one.

With its new insecticide Movento, Bayer CropScience now has a trump card in its hand. "There's no escaping this product – it penetrates through to the remotest parts of the plant, providing reliable control of pests", says Emmanuel Salmon, Product Manager for insecticides at Bayer CropScience. The active substance spirotetramat spreads throughout the entire plant – it simply reaches every part, from root tissues to young, developing shoots. Spirotetramat's movement up and down the plant is continuous, so it eventually becomes distributed

evenly throughout the plant's tissues. This is what sets it apart from almost all the insecticides that have appeared on the market so far. As Emmanuel Salmon points out, "Movento is currently the only modern insecticide that is able to ride the plant's bi-directional transport system."

Integrated Crop Protection with Movento

Bayer CropScience's scientists are especially proud of the fact that besides being extremely effective against insect pests, Movento also possesses remarkable environmental properties. Movento can be considered safe to populations of beneficial

of hide-and-see

arthropods. There were no long-lasting, adverse effects on beneficial bugs, lacewings, spiders, earwigs, ladybird beetles or trichogramma. Furthermore, there was no longer lasting effect on predatory mites. Moreover large scale, internal field tests also demonstrated safety to honey bees as long as the product is used correctly. This good selectivity discloses manifold options for the combined use of this product with beneficials. Movento can be highly recommended for the use in Integrated Pest Management.

The active substance's really innovative property is its ability to move within both the upward-bound water column, and the assimilate stream that moves mainly in the opposite direction. Systemic insecticides

from older chemical classes have so far only been able to move in the water column; they have therefore been unable to reach all parts of the plant. But insect pests have now lost their hideaways.

New tool for resistance management

The active substance spirotetramat derives from the young chemical class of ketoenols, two other representatives of which are now well-established under the trade-names Oberon® and Envidor®. Spirotetramat excels through its broad spectrum of activity against sucking insects. These include aphids, thrips, planthoppers, vine lice, mealy-

bugs, whiteflies and scale insects. The use of this active substance is most profitable in intensively-managed crops such as vegetables, citrus, pome and stonefruits, nuts, grape, hop, potato, tropical fruits, cotton and soybean. Movento's active substance inhibits lipid synthesis in sucking insect pests. It is particularly effective during the insects' early developmental phases; larvae are unable to move after ecdysis, and they eventually dry out. But adult insects are also affected insofar as their fertility is reduced. The pests' typical explosive population growth, which can otherwise be relied upon to occur as soon as environmental conditions become favourable, simply breaks down.

“As no other known classes of active

substance interfere at this particular point in the insect's metabolism, Movento can be an important tool for effective resistance management." says Karl Muenks, Project Leader for spirotetramat at Bayer CropScience. Farmers and horticulturalists around the world have observed that pest insects often become gradually less sensitive to substances belonging to chemical classes that have been represented on the market for a long time. Trials with Movento have demonstrated its strength here – researchers have so far failed to find any indication of cross-resistance, even in aphids and whiteflies that are highly resistant to other compounds. Product Manager Emmanuel Salmon advises that in order to preserve the long-term effectiveness of this new class of insecticides, "Movento should, wherever possible, be used in alternation with products from other chemical classes, and on no more than two occasions within a growing season." He continues: "Because the conditions associated with the application vary greatly from region to region and from year to year, we recommend contacting the local Bayer agronomic advisor for advice, especially with regard to avoiding resistance development."

Reduced number of applications

One of Movento's greatest benefits is its longevity of action – it can protect a crop from pest infestation for several weeks: even insects that attack plants after treatment are affected. Together with optimal distribution within the plant via bi-directional systemic movement, this offers users

the option of reducing the total number of applications. Moreover, this innovative insecticide possesses favourable residues and breakdown profiles. "Movento is the ideal insecticide for farmers running integrated crop protection programs", concludes the Bayer Product Manager.

These particularly positive properties are of course relevant not only to users, but also to the international food-chain, with its high standards of quality. Free trading of farm products requires that maximum residue limits and import tolerances are being held to. Movento's ability to meet these requirements if used as recommended on the label has already been demonstrated – and confirmed by the US Environment Protection Agency, among others. "With Movento, producers have a tool to help them to produce high-quality fruit and vegetables. Food traders and consumers are entitled to expect healthy, safe and op-

tically-attractive products – Bayer's crop protection innovations make a valuable contribution towards achieving this", explains Karl Muenks.

As market introduction has already taken place in many countries, and is imminent in others, Emmanuel Salmon has plenty to do at the moment. The very first registration, which was achieved in Tunisia at the end of 2007, was followed in summer 2008 by further registrations in the USA, Canada, Turkey, West Africa, Morocco and New Zealand. "By 2010, Movento will be in use in more than 70 countries. Its tangible advantages for users, the trade, processors and consumers mean that it presents an attractive alternative to the standard options." Product Manager Salmon is therefore firmly convinced that Movento will soon be gaining considerable market share in fruit and vegetable crops. ■

An overview of Movento's strengths:

- The active substance spirotetramat belongs to the new chemical class of the ketoenols, and possesses a new type of mode of action.
- No cross-resistance with the standard classes of active substance
- Broad activity against sucking insect pests
- 2-way systemicity for optimum distribution within the plant
- Long-term protection
- Spares beneficials, working hand-in-hand with them
- Fulfils the expectations of the food chain and environmental protection requirements.



Whiteflies



Aphids



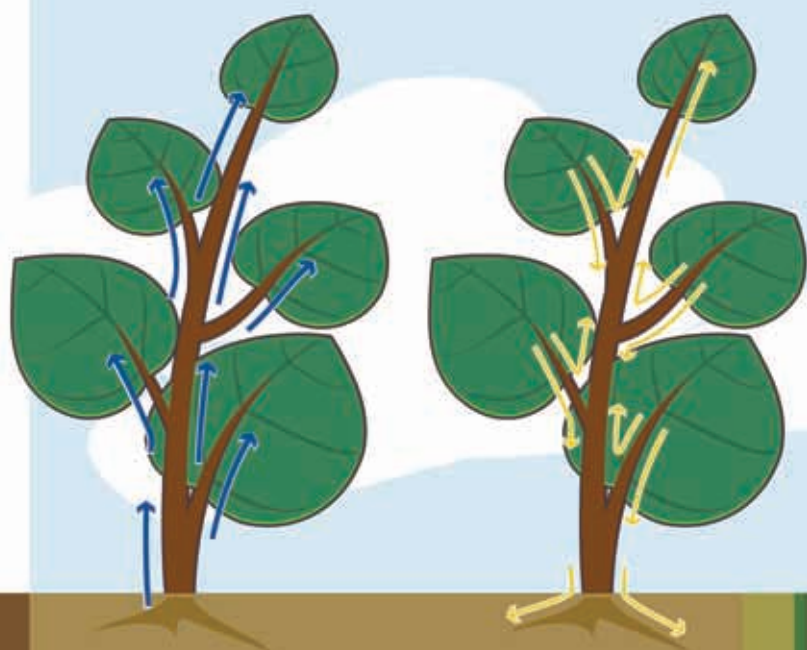
Scales

2-way systemicity

Conventional systemic insecticides work according to the following principle: the active substance is taken up through the leaves and distributed through the plant, predominantly via the xylem. The xylem cells provide a transport path for water and nutrients taken up by the plant's roots; the transport stream is driven by the suction effect caused by the evaporation of water through stomata on the leaves. This means that the conventional insecticides can only be distributed in one direction – towards the point of evaporation. Remote tissues such as the roots, newly developing tissues, or innermost leaves (for example in a head of lettuce) cannot be protected properly from pest insect attack. Things are different with spirotetramat: instead of being restricted to this one-way traffic, it can move in both directions by virtue of its ability to be transported in both the xylem and the phloem. Assimilates and other organic compounds move up and down within the plant's phloem cells – between the roots and the shoot tips, young buds or fruits. This means that even insects hidden in the inner leaves of a lettuce or cabbage head, or those hidden under the bark of a fruit tree, can be controlled effectively. Spirotetramat's excellent mobility also ensures that plant tissues formed after treatment are equally well protected.

A: Translocation pattern of a typical one-way systemic insecticide

B: Movento®'s two-way systemicity



Mealy bugs

Psyllids