

## WHAT'S NEW IN SYSTEMIC INSECTICIDES?

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Systemics are not new as P-40 (sodium selenate) was used in the 1940's on various greenhouse crops. Since that time, systemic organo-phosphorus compounds were developed in the 1950's. These were OMPA, Systox® and phosphamidon which were quite effective against aphids and mites. However, with resistance building up against these materials, other systemics such as Thimet® and Di-syston® were developed. In the late 50's and early 60's several others appeared on the scene and soon showed promise for pests other than aphids and mites. One of the first things these materials were tried on was the flower thrips on various flowering crops. In 1961, Cygon®, Thimet and Di-syston were tried on gladiolus and proved to be very successful in controlling the flower thrips. These materials were next tried in 1962 on field-grown roses for control of thrips and the results were just as good as on the gladiolus. Along with these, two relatives of Cygon, AC43064 and AC47031, were incorporated in the tests and they were as effective as Cygon.

When Cygon was tried on chrysanthemums, we ran into trouble with phytotoxicity as it damaged the plants severely. So, "mums" was one of the more important flowering crops that did not have an effective systemic. In 1964 several new systemics were synthesized and sent to us for evaluation on ornamentals. These were Furadan®, Temik®, and GC 6506. These were tried out on "mums" and the first two proved to be very outstanding on thrips while the third was like Cygon in that it severely damaged the plants. These three materials were followed by Azodrin® and Lannate® and these two were as good as the first two. After testing for three years, it was determined that Temik, Azodrin and Lannate were systemics effective against thrips that could be used on "mums".

In 1966, 13 known or suspected "worm killers" were tried on a new species of lepidopterous larvae and from the tests two of the systemics, Furadan and Azodrin, proved to be the best materials tested. In 1968, several compounds were tested in the field for the control of the geranium plume moth larvae and the tobacco budworm on geraniums. Two of the newer systemics, Lannate and Azodrin, proved to be the best "worm killers." In several tests run against the citrus and Baker's mealybugs, Temik, Lannate, Azodrin and Furadan all proved to be very effective insecticides. Phytotoxicity tests on various plants in the greenhouse and in the field have shown that the plants can tolerate these materials used at a moderate dosage. Several tests are in progress now where systemics are being utilized against several scale species.

MODERATOR MAIRE: Any questions for Pat?

UNIDENTIFIED SPEAKER: Has Temik been released?

PAT MORISHITA: I hope that it will come out about the first of the year. I have no experience with it on commercial crops. I gave Wes Humphrey some of this material and he tried it on Cuban laurel thrips. He had control for somewhere around six months. Timing is going to be very important.

I have a few words to say about control of scales and mealy bug, both of which are pests on woody ornamentals. Four different systemics, Temik, Lannate, Azodrin and Furdan gave very good control of several kinds of scale and mealy bug in greenhouse tests on Cycads. These materials have possibilities in the nursery if they're handled right.

MODERATOR MAIRE: Thank you Pat. At this time we once again have the pleasure of hearing Dr. Robert Raabe. He will tell us "What's New In Systemic Fungicides". Bob.

### SYSTEMIC FUNGICIDES

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The development of systemic pesticides has opened a new era in agriculture. Some systemic insecticides are now available and more are in the process of being tested. Systemic fungicides are in the testing stages and only one has been released to date. The development of systemic fungicides has been slower than that of the systemic insecticides, partly because with the insecticides, the chemical must be effective against an animal system while moving through a plant system. Since fungi are plants, systemic fungicides must be effective against a plant system while moving through a plant system. Though this presents difficulties in finding materials which will be toxic to some plants and not toxic to others, such materials when found have the advantage that they are less likely to be toxic to animals (including man) than the systemic insecticides.

The first group of systemic fungicides to be developed belong to a group of chemicals known as oxathiins. These were first obtained by the Uniroyal Corporation as by-products of sulfur mustards in 1960. In 1963 Vitavax (also known as DCMO or D735) was synthesized and was found to be systemically active against loose smut of barley. Soon a dioxide analog, called Plantvax (also called DCMOD or F461), followed and it was found to be effective in controlling leaf rust and stripe rust.

Both of these compounds have been found to be specific against certain fungi in the Basidiomycetes, namely the rusts