

Chemical Control/New Products

Pyriproxyfen (V-71639), Overview of a New Insect Growth Regulator

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Pyriproxyfen is an insect growth regulator (IGR) from the research laboratories of Sumitomo Chemical Corp. and is being developed in the United States by Valent USA Corp. Pyriproxyfen acts as a juvenile hormone mimic. The presence of juvenile hormone (JH) induces larval molting and the absence of JH induces pupal or adult molting. The same hormone is present in female adults and is called gonadotrophic hormone and its presence assures proper egg formation. The application of V-71639 disturbs the hormonal balance in insects and causes inhibition of metamorphosis, embryogenesis, reproduction and larval development in certain insects.

V-71639 has shown activity in fruit and nut crops for control of pear psylla, Lepidoptera species (codling moth, navel orangeworm, peach twig borer, obliquebanded leafroller, pandemis leafroller) and scale insects (San Jose scale, California red scale; black scale). V-71639 has also shown excellent whitefly activity on a number of crops including the silverleaf whitefly on cotton. Ant activity is also well documented, particularly in combination with a bait to help move the product down into the nest. V-71639 does not have mite activity.

Bee toxicity is not a problem even when V-71639 is applied directly to blooming crops. V-71639 applied to blooming pears or to blooming white dutch clover did not affect honey bee foraging, the number of dead bees found in Todd bee traps, or the development of eggs and larvae when capped cells were examined (Dr. D. F. Mayer, WSU, Prosser, WA, 1994). V-71639 has also been shown safe to beneficial insects such as Orius, Anthocoris, Aphytis, and Encarsia.

Physical properties include low solubility in water (0.36 mg/liter at 20°C), but easily soluble in most organic solvents. V-71639 is sensitive to water and photodegradation, however once inside the leaf itself the material is considerably more stable. Toxicology of the technical material include acute oral LD₅₀ to the male and female rat is >5000 mg/kg and acute dermal LD₅₀ to both male and female rat is >2000 mg/kg. V-71639 is minimally irritating to the eye of the rabbit.

V-71639 is formulated as a 10% EC (100 g ai/liter or 0.83 lb ai/gal). Application rates tested on tree fruits have ranged from 30 to 50 g ai/acre (.066 to .11 lb ai/acre) applied in water volumes of 50 to 350 gal per acre.

Major areas of future research will be to refine application timing for each of the target pests and to expand the documented spectrum of activity for V-71639.

V-71639 has shown promising activity on a number of economic tree fruit pests, with good selectivity to parasite and predator populations. V-71639 will be an additional tool for integrated pest management programs available for rotation with conventional pest control materials or possibly in conjunction with mating disruption programs being developed.