Resmethrin Summary

Resmethrin is a pyrethroid, a synthetic analog of pyrethrins.

Acute toxicity

Resmethrin is moderately acutely toxic to rats. Three metabolites are much more acutely toxic. One of these has an oral rat LD50 of 46 mg/kg -- just below the 50 mg/kg criterion threshold. Resmethrin is highly acutely toxic to fish and honey bees. All calculated expected environmental concentrations for runoff from agricultural use were above the lethal dose for bluegill and trout. One reference showed resmethrin as highly acutely toxic to wild birds, another found it to be essentially nontoxic to quail.

Chronic toxicity

A mouse carcinogenicity study was negative. EPA is requesting additional information about a rat study, which found increased cysts in thyroids at 5000 ppm.

Mutagenic studies were negative, but did not meet EPA's minimum guidelines. The only developmental effect seen in one rat study was a delay in skeletal development, but at maternally toxic doses. Other studies in rabbits, mice, and rats were negative.

Two reproductive studies in rats found increased numbers of pups cast dead and lower pup weight among survivors. EPA considered the effects in one of the studies to be minimal when compared with controls.

Environmental fate

Degrades rapidly in sunlight, slowly in the dark. EPA considered the potential to contaminate groundwater as unknown, but unlikely to be a concern based on related pyrethroids and most use being indoors. Absorption and solubility parameters also indicate poor mobility.

Inerts

The Department of Agriculture provided a printout of approximately 50 products containing resmethrin as the only active ingredient. Two randomly-selected manufacturers were requested to provide inert information for two specific products. Both products contained the same inerts: 1,1,1-trichloroethane, petroleum distillates, and carbon dioxide. The first two are List 2 inerts. The inerts constitute a significant portion of both formulations, with only 0.15% and 0.284% resmethrin.

Conclusions

Resmethrin is moderately acutely toxic to rats, but its metabolites are highly toxic. Resmethrin is extremely toxic to fish, with expected environmental concentrations exceeding lethal doses. It is also highly toxic to honey bees.

Mutagenic and developmental studies have been mostly negative. Carcinogenicity studies have been mixed: one negative, one under going further review. Two reproductive studies have been positive, although EPA considered the effects of one these to be of minimal concern.

Resmethrin degrades rapidly in sunlight, and is unlikely to be a groundwater concern. Bioaccumulation data were not available. Many data gaps are listed in the reregistration document, including residue, leaching, avian LC50 and reproduction, mutagenicity, and honeybee toxicity of residues on foliage.

In terms of the pesticide review criteria, resmethrin would fail for acute toxicity to rats (for the metabolite) and fish, reproductive toxicity, and data gaps. Carcinogenicity may also be a concern, depending on the additional information being reviewed.