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A RE-EXAMINATION OF FIPRONIL TOXICITY IN BIRDS

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ABSTRACT

Fipronil, a phenyl pyrazole insecticide developed in the late 1980s, is the active ingredient in many pest control formulations including the locust-control insecticide Adonis®. Fipronil acts by blocking g-aminobutyric acid (GABA) receptors and exposure of insects at sufficient doses results in severe paralysis and ultimately, death. Adonis® has been used in Australia to control locusts in semi-arid and agricultural areas since 1997. Locust populations build to plague proportions during conditions also attracting breeding birds. Over 100 avian species have been observed coincident with locust control operations. Avian exposure to fipronil occurs via direct contact and by ingesting contaminated insects or seeds. Avian toxicity data demonstrates that there is high species-specific variability in fipronil sensitivity in the few species studied. There is no research, however, explaining this variability. Further, there is no research regarding physiological or behavioural sub-lethal effects of fipronil, nor is there data assessing its toxic effects in avian species that are at high risk of exposure.

We examine firstly the effects and duration of sublethal fipronil exposure in a sensitive and a non-sensitive avian species to determine whether fipronil has predictable sublethal effects, and secondly avian metabolism of fipronil to determine the mode of the toxicity resulting in the variation in species sensitivity; knowledge essential in evaluating the ecotoxicology of fipronil as a result of locust-control spraying.