

Pesticide Toxic to Bees and Aquatic Life Contaminates Surface Waters



(*Beyond Pesticides*, January 24, 2012) Research published this month in the online edition of the *Bulletin of Environmental Contamination and Toxicology* finds that the neonicotinoid pesticide **imidacloprid** contaminates surface waters in agricultural regions. Imidacloprid is a systemic pesticide, meaning it is taken up by a plant's vascular system and expressed through pollen, nectar, and gutation droplets, and is highly toxic to bees, birds and aquatic organisms. The study, "**Detections of the Neonicotinoid Insecticide Imidacloprid in Surface Waters of Three Agricultural Regions of California, USA, 2010–2011,**" concludes that imidacloprid commonly moves offsite and contaminates surface waters at concentrations that could harm aquatic organisms following use under irrigated agriculture conditions.

Researchers at the California Department of Pesticide Regulation collected 75 surface water samples from three agricultural regions of California and analyzed them for contamination with imidacloprid. Samples were collected during California's relatively dry-weather irrigation seasons in 2010 and 2011. Imidacloprid was detected in 67 samples (89%); concentrations exceeded the U.S. Environmental Protection Agency's (EPA) chronic invertebrate Aquatic Life Benchmark of 1.05 µg/L (micrograms per liter) in 14 samples (19%). Concentrations were also frequently greater than similar toxicity guidelines developed for use in Europe and Canada. A benchmark is a chemical concentration, specific to either water or sediment, above which there is the possibility of harm or risk to the humans or animals in the environment.

Neonicotinoids are a class of chemicals that target nerve cells in a similar way as nicotine, acting as neurotoxins to insects. One of the most commonly used neonicotinoids is the insecticide imidacloprid, manufactured by Bayer Crop Science and used in agriculture to control aphids, beetles, and other sucking insects. Imidacloprid has been linked to neural effects in honey bees, including disruptions in mobility, navigation, and feeding behavior - similar behaviors that are being displayed by bees suffering from **Colony Collapse Disorder** (CCD). In CCD, bees are flying off in search of pollen and nectar and simply never returning to their colonies.

Another study looking at neonicotinoid pesticides published this month -conducted by Christian Krupke, PhD, a Purdue University entomologist who will be speaking at the 30th National Pesticide Forum- shows that EPA underestimates the environmental exposure of neonicotinoid pesticides to honey bees, exposing bees even through dandelions grown in contaminated soil. The researchers found even greater exposure to bees during the planting process when bees are exposed to contaminated dust originating on the pesticide-treated seeds. The neonicotinoid pesticides examined in this study were **clothianidin** and **thiamethoxam**.

For more information on pesticides, honey bees and other pollinators, as well as what you can do, see Beyond Pesticides **Pollinator Protection** program page.

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