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Place : Sacramento

From : Department of Food and Agriculture

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Subject: Literature Review of the Environmental Fate of Clandosan

A literature review for environmental fate data of Clandosan was performed using information from the CDFA Pesticide Registration Packet and sources obtained by searching MELVYL Current Contents, MELVYL University Book Catalog, Dialog Chemical Abstracts and Dialog Science Search, and CDFA Environmental Monitoring reprint database.

Clandosan is a compound manufactured by Igene Biotechnology, Inc. and is essentially a mixture of chitin from ground crustacean exoskeletons, urea, soybean meal, and to a much lesser extent, phosphoric acid and various carbonates. No direct studies on Clandosan environmental fate were found. This is probably due to the fact that the major ingredients of Clandosan are considered naturally occurring and nobody seems concerned regarding the individual breakdown paths and products as possible adverse effects in the environment. Clandosan urea would be hard to isolate from natural urea in the environment. Soybean meal is used in livestock feeds. Chitin is a structural component of insect, plankton, crustaceans, algae, annelids, arthropods, mollusks, fungi and nematodes (Chavasit and Torres, 1990). In addition, Clandosan has been exempted by the FDA from medical toxicology and fish and wildlife toxicology requirements due to minimal toxicological properties and naturally occurring properties (Igene, FDA). Chandy and Sharme (1990) reasoned chitin and resulting degradation products were natural and safe in their investigations proposing use of chitin as a biomaterial.

Bacterial degradation of chitin has been studied in various environments (Aumen 1980, Tom 1980, Sturz and Robinson 1985, Cody et al. 1990). A proposed anaerobic fermentation of chitin (Sturz and Robinson 1985) is as follows:

$$8C_8H_{13}(N)O_5 + 18H_2O \rightarrow 29_2CO + 35CH_4$$

The sediment surface has been found the most active region of anaerobic chitin decomposition (Sturz and Robinson, 1985). Rodriguez-Kabana, et al (1983) found fungi to be a primary producer of chitinase (causes enzymatic hydrolysis of chitin) in experimental soils. No other types of environmental chitin degradation or decomposition references were found.

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