

Photodegradation of Bistrifluron under Sunlight and UV irradiation윤영근, 이호주, 유광현, 김정환, 정봉진¹

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Bistrifluron [*N*-2,6-Difluorobenzoyl-*N*-(2-chloro-bis(3,5-trifluoromethyl)-phenyl)urea] is a new insecticide developed by Dongbu-hannong Chemical Co (Korea). Photolysis of bistrifluron was conducted in aqueous solution under sunlight and UV irradiation. Bistrifluron in acetonitrile solution (5.0ppm) showed λ_{\max} at 206 and 254nm. At 60 days after sunlight irradiation, 35.1% of bistrifluron degraded, while 15.5% for dark control was observed. Direct photolysis rate constant of bistrifluron (K_p), after adjusting with dark reaction rate, was $2.0 \times 10^{-3} \text{ day}^{-1}$. The half-life was estimated to 92.4 days. Quantum yield of bistrifluron was calculated to be 5.36×10^{-7} . Photodegradation of bistrifluron was enhanced in natural paddy water, resulting 0.015 day^{-1} of the calculated rate constants and 49.2 hr of half-life. In synthetic humic water solution for the indirect photolysis photodegradation rate constant was $7.1 \times 10^{-3} \text{ day}^{-1}$. By Fenton's reagent of various concentrations, similar results were obtained, suggesting that hydroxy radicals acts as strong sensitizer. Acetone showed strong sensitization effect by triplet oxygens involved mechanism. Photodegradation rate of bistrifluron increased greatly under UV-B (325nm) and UV-C lamp (264nm), but UV-A (364nm) did not affect its degradation and their K_p values were 0.76, 4.95 and 0.02 day^{-1} , respectively.