



Research Article

Persistence of acetamiprid in selected soils of Karnataka

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Summary

Persistence and degradation of acetamiprid was determined in soils of three different locations of Karnataka viz., Kodagu, Bangalore and Chamarajanagar. The soils were incubated at 25 mg kg⁻¹ of acetamiprid using soluble powder formulation grade acetamiprid (Star-20) under different moisture regimes air dry, field capacity, submergence and alternate wetting-drying. The persistence of acetamiprid differed in all the three soils. Higher persistence was noticed in Chamarajanagar soil followed by Kodagu and Bangalore soils. Half-life ($t_{1/2}$) of acetamiprid was found to be highest in air dry moisture regime in Chamarajanagar soil (97.6 days) compared to Kodagu soil (96.8 days) and Bangalore soil (95.2 days). The half-life values in field capacity, submergence and alternate wetting-drying are 56.7, 64.5 and 61.8 days (Kodagu), 59.4, 66.7 and 57.7 (Bangalore) and 59.1, 66.7 and 70.8 days (Chamarajanagar) soils, respectively. The degradable pattern of acetamiprid residue followed a close correspondence to first order exponential degradation in all the three soils.

Key words : Acetamiprid, Field capacity, Submergence, Alternate wetting-drying, Exponential degradation

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Introduction

Crop protection is an integral part of agriculture with pesticide application as a major component. It is estimated that one third of the world's food crop is destroyed by the pests annually. Chemical pesticides play an important role in increasing crop production by reducing the incidence of pest attacks. Pesticides are inherently poisonous molecules and have the potential to harm the environment if not used properly. The neonicotinoid insecticide acetamiprid (N-[(6-chloro-3-pyridyl) methyl]-N-cyano-N-methyl-acetamidine) is a new-generation insecticide with ground and aerial application against aphids, leafhoppers, whiteflies, thrips, leaf beetles, leaf miner moth, termites etc. It is commonly used on leafy vegetables, fruiting vegetables, cole crops, citrus fruits, pome fruits, grapes, and ornamental plants and flowers. It selectively binds and interacts with the insect nicotinic acetylcholine receptor site. It has been used to great effect in order to control some harmful insects

which are tolerated to conventional insecticides. Acetamiprid poses low risks to the environment relative to most other insecticides and its use would pose minimal risk to non target plants (USEPA, 2002). With this in view, a study on persistence of acetamiprid in selected soils of Karnataka was conducted.

Resources and Research Methods

A laboratory experiment was conducted using soils from three districts of Karnataka viz., Kodagu, Bangalore and Chamarajanagar to study the persistence and degradation of acetamiprid on different soils. Persistence was studied by using formulation grade Star-20 (Acetamiprid -20 % SP). Twenty gram of each soil was weighed into 20 mm x 100 mm glass tubes or 125 ml conical flasks, 1 ml of freshly prepared acetamiprid solution in acetone was added quantitatively to each soil to give concentration of 25 mg kg⁻¹. The soil moisture was maintained as per the treatments details.