AN AJSS

An Asian Journal of Soil Science

Volume 7 | Issue 1 | June, 2012 | 8-12

Research Article

Field studies on persistence of pyrazosulfuron-ethyl in soil, ground water and residues in transplanted rice

D.V. NAVEEN, R. C. GOWDA AND B. MAMATHA

Received : *12.01.2012;* **Revised :** *15.02.2012;* **Accepted :** *20.02.2012*

MEMBERS OF RESEARCH FORUM :

Corresponding author :
D.V. NAVEEN, Department of Soil Science and Agricultural Chemistry, College of Agriculture, University of Agricultural Science, G.K.V.K.,BENGALURU (KARNATAKA) INDIA
Email: dvnaveena@gmail.com

Co-authors :
R.C. GOWDA AND B. MAMATHA, Department of Soil Science and Agricultural Chemistry, College of Agriculture, University of Agricultural Science, G.K.V.K.,BENGALURU (KARNATAKA) INDIA

Summary

Field experiment was conducted at Zonal Agricultural Research center, Kathalagere, during *Kharif* 2008. To study persistence and residues of pyrazosulfuron-ethyl in soil and ground water in transplanted rice ecosystem were estimated using HPLC technique. Pyrazosulfuron-ethyl was applied at 25 g a.i. ha^{-1} and 50 g a.i. ha^{-1} with and without addition of recommended farm yard manure in transplanted rice. The study revealed that the residue of pyrazosulfuron-ethyl in soils ranged from 0.0103 and 0.0199 mg kg^{-1}, respectively with FYM at recommended and double the recommended dose on 2nd day of application. And without FYM the residues were 0.0116 and 0.0229 mg kg^{-1}, respectively. The residues were detected up to 35 days only. The half-life of pyrazosulfuron-ethyl ranged from 16.6 to 21 days. The results revealed that the residues of pyrazosulfuron-ethyl were below the detectable level in the post harvest soil, paddy grain and straw. No residues of pyrazosulfuron-ethyl were detected in ground water up to two weeks after the application of pyrazosulfuron ethyl. After two weeks the residues were detected in ground water collected from both the piezometers which were applied with recommended and double the recommended dose of pyrazosulfuron-ethyl .The residues ranged from 0.0071 to 0.0042 mg kg^{-1} between 21st and 28th day, respectively, after which the residues were below the detectable level both at recommended and double the recommended level of application. A maximum of 0.0154 mg kg^{-1} on 21st day and minimum of 0.0023 mg $kg^{-1}$of pyrazosulfuron ethyl residues on 35th day were detected in the underground water.

Key words : Pyrazosulfuron-ethyl, Half-life, HPLC

How to cite this article : Naveen, D.V., Gowda, R.C. and Mamatha, B. (2012). Field studies on persistence of pyrazosulfuron-ethyl in soil, ground water and residues in transplanted rice. *Asian J. Soil Sci.*, **7**(1): 8-12.

Introduction

India is a leading producer of rice *(Oryza sativa* L.) in the world. Every year most of the yields losses occurring due to the infestation of grass, annual and perennials broad leaved weeds and sedges. There are many herbicides to control these weeds. Among them pyrazosulfuron- ethyl is a selective pre-emergence sulfonylurea herbicide, used primarily to control broadleaf weeds and some grasses. It is already established that sulfonylurea group of herbicides are very effective against various weeds and grasses (Suzuki *et al.*, 1990: Umehara and Suzuki, 1992: Hamada *et al.*, 1999: Chu *et al.*, 2002).

This herbicide has become more popular due to its high activity at low application rates and low mammalian toxicity. Although pyrazosulfuron-ethyl would appear to be degraded rapidly in soils like other sulfonylureas herbicides (Kim *et al.*, 2003a and 2003b; Mikada *et al.*, 1996). Pyrazosulfuron-ethyl herbicide application in soil leads to various reaction in soils and environment, which determine the toxicity and persistence in the soil and plants. The breakdown of pyrazosulfuron-ethyl is largely depends on soil temperature, moisture content, organic matter and pH. The chemical will degrade faster under acidic condition, and soil with higher moisture content at higher temperature. In Karnataka pyrazosulfuron-ethyl is recommended for transplanted rice at 25 g a.i ha^{-1} and is available as Sathi (Trade name) 10 WP in 80 g packet, being extensively used in Bhadra commend area.