



EFFECT OF PESTICIDES ON ENZYMATIC ACTIVITIES AND NITROGEN MINERALIZATION IN SOILS

Arvind Kumar

Department of Ag. Chemistry and Soil Science, R. K. (PG) College, Shamli - 247 776 (U.P.).

E-mail : rastogiakumar62@gmail.com

ABSTRACT

The activities of soil enzymes *viz.* urease, acid phosphatase and dehydrogenase were significantly inhibited (4.00 to 25.21%) by pesticides i.e. captafol, carbofuran and butachlor and it was comparatively higher in salt affected soil. The urea N-mineralization was significantly inhibited (4.00 to 25.03%) by the application of pesticides and it was comparatively higher in acid soil. The higher doses of pesticides inhibited higher level of enzyme activities and urea N-mineralization were observed at longer days of incubation. Thus, to avoid the inhibition of biochemical processes in soil it is advisable to apply the pesticides at least after one month of fertilizer application.

Key words : Soils, Pesticides, Enzymatic activities, Nitrogen mineralization.

INTRODUCTION

Soil is a living system where all biochemical activities proceed through enzymatic processes. It is well known that all biochemical reactions in soils are catalysed by soil enzymes. The physiochemical state of enzymes and their influence on biochemical reactions are markedly dependent on pH, ionic strength, temperature and presence or absence of inhibitors or activators. The use of agricultural chemicals in present agriculture is imminent, for controlling pests. Despite the beneficial impact of pesticides in improving and stabilizing agricultural productivity by the control of obnoxious weeds, fungi and insects, these organic chemical may be one of the inhibitors or activators of soil enzymes (Bollag and Stotzky, 1993). Living organisms in soils are generally

produced these enzymes. It seems obvious therefore that any compound which alters the number or activity of micro-organisms could therefore affect directly the activities of soil enzymes *viz.* urease, phosphatase, dehydrogenase etc. and indirectly the soil biochemical processes and ultimately influence the soil fertility and plant growth. Keeping this in mind, a concerted effort has been made to study the effect of three popular pesticides *viz.* carbonfuran, captafol and butachlor on activities of soil enzymes, specifically urease, acid phosphatase and dehydrogenase and urea nitrogen mineralization in three different soils of Uttar Pradesh. Moreover, the influence of soil characteristics on enzyme activities and N-mineralization have also been considered. Thus, the objectives of the present study are: