

## SUMMARY AND CONCLUSION

This study was conducted to investigate the effect of the rhizosphere of corn and soybean plants on the mineralization of P-nitro phenol "PNP", 2,4-dichlorophenoxy acetic acid "2,4-D" and glyphosate in clay loam and silty loam soils. The effect of corn and soybean root exudates as well as synthetic root exudates on the mineralization process were also considered.

A modified model system was used for the cultivation of corn and soybean seedlings under laboratory conditions. PNP, 2,4-D and Glyphosate were applied at a concentration of 1ppm in the surface of the soils used. The mineralization of the three radiolabeled compounds was determined as the amount of  $^{14}\text{CO}_2$  evolved during the mineralization process. Corn and soybean root exudates as well as synthetic root exudates were added to the surface of the soils under investigation and  $^{14}\text{CO}_2$  evolved from the mineralization of PNP, 2,4-D and glyphosate was measured over time of the experiments.

The obtained results revealed that :-

1. Both corn and soybean plants had a non-significant effect on PNP mineralization in both clay loam and silty loam soil.
2. In the soil irrigated with either corn or soybean root exudates, there was a highly significant difference in PNP mineralization compared with the soils irrigated with nutrient solution as a comparative study.
3. In soil irrigated with synthetic root exudates, there was a highly significant difference in PNP mineralization compared with soil irrigated with deionized water as a control.
4. From the obtained results, it can be concluded that, both corn and soybean root exudates as well as synthetic root exudates may provide PNP degraders with a necessary nutrients to facilitate its mineralization.
5. In comparing PNP mineralization in the presence of corn and soybean plants, it was observed that there was a slightly increase in the extent of PNP mineralization in the presence of soybean plants than that in corn plants in the same type of soil.

6. It was also observed that, PNP mineralization in clay loam soil was much better than that in silty loam soil.
7. mineralization was stimulated in the presence of corn plant compared with soil without plant in clay loam soil, Therefore, the presence of the rhizosphere of corn plant may be considered responsible for the increase of 2,4-D mineralization.
8. When pH of 2,4-D soln. was changed from pH= 4 to pH=6 , the adjustment of pH did not accelerate the mineralization process.
9. It was observed that, the presence of soybean plant did not accelerate the mineralization of 2,4-D in clay loam soil.
10. In silty loam soil, the results showed that, there was non significant increase in 2,4-D mineralization in soil cultivated with corn or soybean plant compared with soil without plant.
11. In soil irrigated with corn or soybean root exudates, the results showed that, there was a slight increase in 2,4-D mineralization but this

increase was non significant compared with the same type of soil irrigated with nutrient soln.

12. The previous trend was observed in soil irrigated with synthetic root exudates.

13. Data revealed that clay loam soil cultivated with corn or soybean plant showed a significant increase in glyphosate mineralization compared with uncultivated soil, so, the rhizosphere of corn or soybean plant may provide a favourable environment for stimulating the breakdown of glyphosate.

14. In silty loam soil, the results indicated that, neither corn nor soybean plant showed a significant effect on glyphosate mineralization.

15. In soil irrigated with corn or soybean root exudates, the results showed that irrigation with natural root exudates failed to give any significant effect on glyphosate mineralization.

16. The application of synthetic root exudates gave a slight increase in glyphosate mineralization compared with soil irrigated with deionized water.