Click www.researchjournal.co.in/online/subdetail.html to purchase.

Research Paper :

Effects of herbicides on the growth and activity of *Azospirillum lipoferum* and *Bacillus megatarium* var phosphaticum under *in vitro* conditions

P.C. LATHA AND H. GOPAL

International Journal of Plant Protection (April, 2010), Vol. 3 No. 1 : 50-54

See end of the article for authors' affiliations

Correspondence to :
P.C. LATHA
Department of Agricultural Microbiology, Tamil Nadu Agricultural University, COIMBATORE (T.N.) INDIA

SUMMARY

The growth of *Azospirillum lipoferum* and P solubilising capabilities, *Bacillus megaterium* and growth as influenced by the presence of herbicides were studied under laboratory conditions. The results indicated that butachlor supported lesser population of *Azospirillum lipoferum* (26.10 % reduction over control) and *Bacillus megaterium* (58.18% reduction over control) when compared to other herbicides.

Key words : Herbicides, *Azospirillum lipoferum, Bacillus megaterium*

In India, herbicides constituted only 15per cent of the total consumption of pesticides, compared to the worldwide consumption of 47.5 per cent. The herbicide consumption is expected to increase dramatically in future as the use of herbicides has been expanding more rapidly than that of the other pesticides. Herbicide usage, which was earlier confined to plantation crops, has now expanded to crops like wheat (42 per cent of the total consumption of herbicides) and rice (30 per cent) with the states of Punjab, Uttar Pradesh, Tamil Nadu and Andhra Pradesh leading in the consumption of more herbicides (Yadaraju and Mishra, 2002).

Research on the effect of herbicides on the soil microbial community in the rice field ecosystem is still fragmentary and inadequate to draw any major conclusions on the impact of herbicides, as majority of the research on tropical wetlands during the past decades focused mainly on the photosynthetic algae. In addition, most of the earlier studies on the impact of herbicides on soil microflora in wetland rice fields had emphasized only on short term acute impacts, while little is known about the chronic effect of repeated and long term application of herbicides under field conditions. Disappearance of components of microbial communities along with a population shift towards microorganisms more efficient in herbicide degradation have been known to occur when herbicides are applied repeatedly, leading to loss of microbial diversity and causing biological degradation of soil (Seghers *et al.*, 2003). The consequences of herbicide induced changes in microbial population would be most evident during biofertilisation, where the microbial population play an important role in maximizing the productivity of crops, as the herbicides, applied to soil persist during the development of plant roots and interact with the biofertilisers applied through seed and root inoculation (Forlani *et al.*, 1995). Moreover, the continuing introduction of new classes of herbicides and the practice of using herbicide mixtures to control weeds, demand a continued research effort to ensure that harmful effects to the ecosystem is avoided. Thus, there is a need to study the influence of herbicides on the microflora and their activities of flooded soils under realistic field conditions and cultural practices on a long term basis to derive any meaningful conclusions.

The increase in food production, till date, had come at the cost of the environment with both qualitative and quantitative degradation of land, water and bioresources (Sarkar and Ghosh, 2001). Hence, it has been advocated that, in the future, any increase in production should be obtained with practices that maintain or enhance the quality of the environment and

Accepted :
January, 2010