



Compatibility and feasibility evaluation of zinc application with pesticides and bio-fertilizers as seed treatments in maize

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ABSTRACT

Importance of Zn in plant and crop production is well known. Role of Zn in animal and human health as mineral is also reported by several scientists. Simultaneously, deficiency of Zn is widely recognized in soils of India. Micronutrients are applied in the form of soil application, foliar spray or pre sowing seed treatment. Application of micronutrients through seed treatment nourishes crops at the critical early stages and helps in improving crop growth and is cheaper than foliar/ soil application. Other seed treatments like biofertilizer, insecticide and fungicide are also being exploited by the farmers. All these seed treatments have their individual application methods and positive impact on higher and quality produce. There is a need to develop technology which includes all such seed treatments viz., nutrient supply, biofertilizer, insecticide, fungicide etc. in order to get multiple benefits economically. Gujarat Maize – 6 variety was selected as the test crop. Seed treatment material included were zinc, bio-fertilizer (*Azospirillum brasilense* ABA– 1 and *Bacillus coagulense* PGA-1), insecticide (Imidacloprid) and fungicide (Thiram). Pot study was carried out and maize was grown up to 60 days and dry matter yields were recorded. The treatment consisting of Zn, insecticide and biofertilizers (*Azospirillum* and PSB) as seed treatment gave consistent results in increasing shoot yield and was found significantly highest over control. It was at par with the treatment combination of biofertilizers (*Azospirillum* and PSB) as seed treatment and Zn through soil application. The results revealed that the combined application of Zn, biofertilizers and pesticides is possible to increase yield due to early nourishment through Zn and biofertilizers as well as insecticides. Thus, zinc application as seed treatment in combination with conventional seed treatments i.e. biofertilizer, insecticide and fungicide was found feasible. Among the different seed treatment combinations, Zn was found more compatible with biofertilizer and insecticide rather than fungicide. The Zn application as seed treatment found equally efficient to Zn supplementation through soil application in increasing growth and dry matter yield of maize, was economical besides reduction in chemical load.

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Key words : Zinc, Insecticides, Biofertilizers, Fungicides, Seed treatment, Soil application

INTRODUCTION

Zinc deficiency is the most widely recognized deficiency in India. Micronutrients are applied in the form of soil application, foliar spray and pre sowing seed treatment. Micronutrient deficiencies and their impact on crop yields are widely reported in various parts of the country (Singh, 2008). There are reports of wide spread micronutrient deficiency in different soils of Gujarat due to intensive cropping systems and use of micronutrient free fertilizers besides less use of farm yard manures (Patel *et al.*, 1999). The lack of Zn can limit the growth and

productivity of a wide range of crops. It is therefore, necessary to supplement Zn for higher crop yields. Corrections of micronutrient deficiency require application of high doses of fertilizer to soils because of low nutrient-use efficiency. Application of micronutrients through seed treatment nourishes crops at the critical early stages and helps in improving crop growth. Fungicide seed treatments are commonly used to prevent seed-borne diseases. Insecticidal seed treatments protect crop against soil borne insects and sucking pests during early crop growth period. Further, bio-fertilizer or microorganism strain inoculation

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