

**Abstract No: BO-26**

### **Effect of phosphorus fertilizers and soil amendments on cadmium accumulation in maize (*Zea mays* L.) seeds**

P. C. U. Wanninayake<sup>1</sup>, P. N. Yapa<sup>1\*</sup>, M. A. P. W. K. Malaviarachchi<sup>2</sup> and R. P. Hettiarachchi<sup>3</sup>

<sup>1</sup>Department of Biological Sciences, Faculty of Applied Sciences, Rajarata University of Sri Lanka, Mihintale (50300), Sri Lanka

<sup>2</sup>Field Crop Research and Development Institute, Department of Agriculture, Mahailuppallama, Sri Lanka

<sup>3</sup>Soil and Plant Nutrition Department, Rubber Research Institute of Sri Lanka, Dartonfield, Agalawatta, Sri Lanka

\*pnyapa40@yahoo.co.uk

Phosphorus (P) is important for plant growth and metabolism. Higher percentage of phosphorus (up to 80%) is immobile or unavailable to uptake by plants because of adsorption, precipitation, leaching and conversion to organic forms. As a result, about 30 million tons of phosphorus fertilizer is used in agriculture worldwide every year. Phosphorus fertilizers contain cadmium (Cd) as a contaminant at different levels from trace amounts to high. Once accumulated in agricultural products, Cd can enter the human body resulting in severe health issues. Therefore, investigating the effect of different types of P fertilizers on Cd uptake and accumulation in maize seeds was the main focus of this study. A field trial was carried out at Field Crop Research and Development Institute in Mahailuppallama. Eppawela rock phosphate (ERP) and triple super phosphate (TSP) were separately applied as P fertilizers, with four amendments namely compost, biochar, dolomite and arbuscular mycorrhizal inoculants (AMF) in a randomized complete block design with three replicates. Amount of Cd in soil and accumulated in seeds were determined using Atomic Absorption Spectrophotometry and the data was analyzed using a two-factor factorial design. Available soil Cd and total seed Cd amount were significantly higher ( $p < 0.05$ ) in TSP treatments compared to ERP treatments, with and without the amendments. Addition of organic amendments compost, biochar and dolomite to the soil significantly reduced seed Cd level compared to treatments without the amendments. There was no colonization of AMF in TSP applied soil, while 25-60% colonization was recorded with ERP. Therefore, conclusion of the study was that ERP contribute to lower Cd accumulation in maize seeds and with the addition of compost and biochar with ERP, cadmium accumulation was further reduced.

**Keywords:** Phosphorus, Cadmium, *Zea mays* L. Triple super phosphate, Eppawela rock phosphate, seed Cd accumulation