

Effect of Phosphorus Application on Growth of Crops

P. Kejiya¹, G. K. Surya Krishna², B. Rajeswari³ and B. Vajantha⁴

¹PhD Scholar, Department of Soil Science and Agricultural chemistry, S.V.Agricultural College, Tirupati, ANGRAU- Andhra Pradesh

²PhD Scholar, Department of Soil Science, Agricultural College, Bapatla, ANGRAU- Andhra Pradesh

³M.Sc (Agri). Department of Soil Science and Agricultural chemistry, S.V.Agricultural College, Tirupati, ANGRAU- Andhra Pradesh

⁴Scientist, Department of Soil Science, Agricultural Research Station, Perumallapalle, Tirupati, ANGRAU, Andhra Pradesh

SUMMARY

Phosphorus (P) is a second leading limiting factor after nitrogen for plant growth and productivity on 40% of the world's arable soil. It plays key roles in many plant processes such as energy metabolism, the synthesis of nucleic acids and membranes, photosynthesis, respiration, nitrogen fixation and enzyme regulation. Adequate phosphorus nutrition enhances many aspects of plant growth development including flowering, fruiting, root growth and yield components of different crops. P uptake in plants is often constrained by the very low solubility of P in the soil. In agricultural systems, phosphorus in the harvested crops is removed from the system, resulting in P deprived soils if no P is supplemented as fertilizer. Phosphorus is a vital component of ATP, the "energy unit" of plants. Better root growth and development with P fertilization encouraged the higher uptake of nutrients resulting in better seedling growth, grain formation and maturity.

INTRODUCTION

Phosphorus (P) is a second leading limiting factor after nitrogen for plant growth and productivity on 40% of the world's arable soil. It plays key roles in many plant processes such as energy metabolism, the synthesis of nucleic acids and membranes, photosynthesis, respiration, nitrogen fixation and enzyme regulation. Adequate phosphorus nutrition enhances many aspects of plant growth development including flowering, fruiting, root growth and yield components of different crops. P uptake in plants is often constrained by the very low solubility of P in the soil. In agricultural systems, phosphorus in the harvested crops is removed from the system, resulting in P deprived soils if no P is supplemented as fertilizer.

Functions

- Involved in Energy storage and transfer. Also carry various metabolic processes in plants.
- Involved in cell division and development of meristematic tissue and thus it improves better vegetative growth of plants.
- Important for root development and stimulates root growth.
- Helps in primordial development, flowering, seed formation, ripening of fruits germination of seeds and also early maturity of crops.
- It is essential for formation of starch, proteins, nucleic acids, photosynthesis, nitrogen-metabolism, carbohydrate metabolism, glycolysis, respiration and fatty acid synthesis.

Deficiency Symptoms of Phosphorus in Plants

- Stunted and slow growth of plants due to its effects on cell division and meristematic tissue development.
- Leaves are small and defoliation starts from the older leaves and premature leaf fall.
- Purplish discoloration of foliage due to anthocyanin pigment. Plants develop dead necrotic areas on the leaves, petioles or fruits.
- Slender and woody stem with under developed roots are characteristics symptoms.
- Delay in flowering and ripening of fruits, inferior quality, shedding of blossom, inflorescence becomes small and premature fruit falling.
- Inhibit the sugar synthesis or abnormally high sugar levels in plant.

CONCLUSION

Phosphorus is well known for its role as 'Energy currency' and plays a key role in development and energy transformation in various vitally important metabolic processes in the plant. Phosphorus is a vital component of ATP, the "energy unit" of plants. ATP forms during photosynthesis, has phosphorus in its structure, and processes from the beginning of seedling growth through to the formation of grain and maturity. Better root growth and development with P fertilization encouraged the higher uptake of nutrients resulting in better grain formation.

REFERENCES

- Lakhan, S., Sharma, P.K., Jajoria, M., Deewan, P and Verma, R. 2017. Effect of phosphorus and zinc application on growth and yield attributes of Pearl millet (*Pennisetum glaucum* L.) under Rainfed Condition. *Journal of Pharmacognosy and Phytochemistry* 6(1): 388-391.
- Chandrakala , M., Srinivasamurthy, C.A., Kumar, S and Naveen, D.V. 2017. Effect of application of graded Level of phosphorus to finger millet - maize cropping system in soils of different P fertility. *Int.J.Curr.Microbiol.App.Sci* 6(11): 265-280.