

EFFECT OF PRIMERS ON GROWTH AND BIOCHEMICAL PARAMETERS OF RAINFED RICE

Kumud Upadhyay,*Uma Singh, R.K. Yadav, H.C.Yadav, Mubeen,**Satendra Kumar and Kalpana

Department of Crop Physiology, N.D. U. & T., Kumarganj (Faizabad) -224 229

**Department of Soil Science, S.V.P.U. A. & T., Meerut -250110

Abstract: An experiment to study the effect of primers on growth and biochemical parameters of rice (Var. NDR-118) was conducted at Department of Crop Physiology, N.D. University of Agriculture & Technology, Kumarganj, Faizabad (U.P.). Seed priming was done by soaking the seeds for 16 hours in distilled water, GA₃ 50 ppm, GA₃ 100 ppm, GA₃ 150 ppm, K₂HPO₄ 300 ppm, K₂HPO₄ 400 ppm and K₂HPO₄ 500 ppm. Application of primers brought a considerable increase in growth parameters like root length, root and shoot dry weight. The biochemical parameters viz., total chlorophyll content, total soluble carbohydrate and nitrate reductase activity showed a significant increase due to seed priming. Among different treatments, GA₃ 100 ppm was the best treatment in increasing these parameters being at par with GA₃ 50 ppm and significantly higher than rest of the treatments.

Keywords: GA₃, primers, rice, soluble carbohydrate, nitrate reductase

REFERENCES

Acharya UT, Prakash K and Prathapasenan G (1990). Effect of gibberellic acid on seedling growth and carbohydrate metabolism during germination of rice (*Oryza sativa* L.) Var. GR-3 under saline condition. *J. Agron. and Crop Sci.* 165:6-13.

Arnon DI (1949). Copper enzymes in isolated chloroplast polyphenol oxidase in *Beta vulgaris*. *Plant Physiology* 24 : 1-15.

Evans HJ and Wildes RA (1971). Potassium and its role in enzyme activation. *Proc. 8th Int. Potash Inst. Bern*, pp. 13-39.

Evins WH and Varner JE (1971). *Proc. Nat. Acad. Sci. (U.S.)*. 73: 138.

Farooq M and Basra Shahzad MA (2005). Rice cultivation by seed priming, Dawn group of Newspaper (August 19). Rajab 23, 1426.

Gupta US (1984). Note on physiological approach for increasing early salt tolerance of green gram (*Vigna radiata*). *Curr. Agric.* 8 (3-4): 182-185.

Jaworski K. (1971). Nitrate reductase assay in intact plant tissues. *Biochem. Biophysics Res. Comm.* 43: 1274-1279.

Jones RL and Mac Millan (1984). In *Advanced Plant Physiology*, Wilkins, M.D. (ed.) Pitman, P.21.

Kaur S, Gupta AK and Kaur N (2005). Seed priming increases crop yield possibly by modulating enzymes of sucrose metabolism in chickpea. *Journal of Agronomy and Crop Science* 199 (2) : 81-87.

Krishnasamy V and Srimathi P (2001). Seed management for rainfed agriculture-land use planning and watershed management, pp. 140-144. Edited by Dr. M. Balusamy, Dr.C.R. Chinnamuthu and Dr. A. Velayutham, TNAU.

Muhammad A (2005). Effect of seed priming on emergence, yield and storability of soybean, NWF

Agricultural University/Faculty of Crop Production Sciences, P. 192.

Pandey, Savita and Srivastava HS (1992). Cytokinin effects on nitrate reductase activity in *Leucaena leucocephala* seedlings in the presence of different nitrogenous salts. *Indian J. Plant Physiol.* 35 (1) : 64-72.

Panse VG and Sukhatme PV (1978). Statistical method for Agricultural workers.

Sharma S, Dey SC and Chaudhary AK (1995). Effect of seed hardening, potassium levels and antitranspirant on proline content and NR-activity in rice (*Oryza sativa* L.). *Journal of Potassium Research* 11 (3-4) : 373-376.

Singh H, Darra BL and Jain N (1974). Role of some hormones as a pre-soaking seed treatments on growth and yield attributes of wheat. *Annls. Aridzone* 13 (2) : 84-93.

Singh T and Kumar V (1989). Nodulation and plant growth as influenced by growth regulators in some legumes. *Acta Bot Indica* 17: 177-181.

Singhvi NR and Chaturvedi HK (1984). Effect of zeatin on seedling growth and chlorophyll contents in *Raphanees sativum* L. *Physiology and Ecology* 14 (3) : 169-179.

Suelter CH (1970). Enzymes activated by monovalent cations. *Science* 168: 789-795.

Yemm EW and Willes AJ (1954). The estimation of carbohydrates in plant extracts by anthrone. *Biochem. J.* 57 : 508-514.

Zaidi PH and Singh BB (1993). Alleviation of salinity responses on proline accumulation and nitrate assimilatory enzymes by growth regulators in soybean (*Glycine max* L. Merrill). *New Agriculturist* 4 (1) : 41-46.

Zhao Ke-J, Li Ming-liance and Liu-Jia Jau (1986). Reduction by GA₃ of NaCl induced inhibition of growth and development in *Scaaeda Ussuriensis*. *Aust. J. Plant Physiol* 13: 547-551.