

Effect of triacontanol on the growth of waterlogged green gram cultivar ARM-1

■ N. ARUN AND G. KUMARAVELU

SUMMARY

Seeds of green gram [*Vigna radiata* (Linn.) Wilczek cv. ARM-1] were grown in big plastic containers for waterlogging treatment. Two types of experiments were performed. In experiment I, ten – days old green gram plants were put to waterlogging condition for different periods *viz.*, 3 or 7 days and then analyzed at 15 and 20 DAS, respectively. Control plants were maintained along with the other experimental plants. Various morphometric measurements and biochemical estimations were made at different stages. This experiment confirmed that the green gram plant was able to tolerate 3 days waterlogging period when compared to 7 days period. With this result, another experiment was conducted in 3 days waterlogged plants. These waterlogged plants were sprayed with different concentrations of triacontanol. The results of the first experiment clearly showed a significant increase in pH, conductivity, TDS and salinity levels of the stagnant water when compared to control. The conductivity levels were almost doubled in 7 days stagnant water compared to 3 days. In 7 days of waterlogged plants, the root, shoot and the plant length was significantly increased over control plants. Waterlogging stress promoted the formation of adventitious roots and aerenchymatous tissue. Longer duration of waterlogging period significantly promoted the production of aerial roots. There was a decrease in the number of nodules, total leaf area in waterlogged plant. The root, shoot and plant biomass was significantly decreased in 7 days waterlogged cultivar. The photosynthetic pigments, leaf protein, sugars, starch and phenol contents were significantly lowered by water treatment in 7 days old plants.

Key Words : Green gram, Waterlogging, Flooding, TRIA

How to cite this article : Arun, N. and Kumaravelu, G. (2012). Effect of triacontanol on the growth of waterlogged green gram cultivar ARM-1. *Internat. J. Plant Sci.*, 7 (1) : 140-146.

Article chronicle : Received : 23.09.2011; Sent for revision : 08.10.2011; Accepted : 03.12.2011

Waterlogging generally decreases growth and yield of legume crops. Water stress in *Asplenium nidus* decreased all growth parameters and some physiological responses. Under water stress condition growth of root increased when compared to normal optimum condition (Ainuddin and Nur Najwa, 2009). Jackson *et al.* (2009) confirmed the recovery of the plants during waterlogging

seems to be associated with morphological alterations, such as development of adventitious roots and aerenchyma tissue, and with the maintenance of neutral amino acids in roots. Waterlogging had significant effect on plant height, stem diameter, leaf area, biomass production and root growth (Changdee *et al.*, 2009). Viviane *et al.* (2010) found that flood stress induced changes in pigment and protein contents and in photochemical efficiency of thylakoid membranes of chloroplasts and induce changes in genetic, morphological and physiological processes, altering the growth and development of plants. The Foliar application of TRIA at 0.2 per cent -0.5 per cent significantly promoted the plant height, fresh mass, and contents of chlorophylls, saccharides, starch, soluble proteins, amino acid and phenols was confirmed by Muthuchelian *et al.* (1995), Kumaravelu *et al.* (2000),

MEMBERS OF THE RESEARCH FORUM

Author to be contacted :

N. ARUN, Department of Botany, Kanchi Mamunivar Centre for Post Graduate Studies, Lawspet, PUDUCHERRY (U.T.) INDIA
E-mail: yoursarun85@gmail.com

Address of the co-authors:

G. KUMARAVELU, Department of Botany, Kanchi Mamunivar Centre for Post Graduate Studies, Lawspet, PUDUCHERRY (U.T.) INDIA