

Priming with Nitric Oxide Donor Sodium Nitroprusside Enhances Germination and Storage Life of Recalcitrant Rubber (*Hevea brasiliensis*) Seeds

N.M.C. Nayanakantha¹, K.A.U. Madushani², B. Karunarathna², P. Seneviratne¹ and B.M.S.S. Panditharathna¹

Department of Plant Science, Rubber Research Institute of Sri Lanka, Agalawatta, Sri Lanka

² *Department of Crop Science, Eastern University, Chenkalady, Sri Lanka*

Rubber (*Hevea brasiliensis*) seeds lose their viability within a few days after falling from the tree. Use of old seeds has resulted in low germination percentage and extended germination time in commercial rubber nurseries. Nitric oxide (NO) is a signaling molecule involved in biological processes from seed germination up to senescence. The present study explored the effect of NO donor sodium nitroprusside (SNP), as a chemical priming agent, on germination and storage life of rubber seeds and subsequent growth of seedlings. Fresh rubber seeds were soaked in SNP solutions at different concentrations viz., 50, 100 and 150 μ M for 24 hours and were sown in a germination bed after storing at different time intervals viz., 0, 7, 14, 21 and 28 days, respectively. 140 seeds were used for each treatment at each storage time interval. No germination was recorded after 28 days of storage irrespective of priming treatments. At zero day of storage, there was no significant difference in germination percentage. However, after the 7th day of storage, a significantly ($p < 0.05$) higher germination percentage was recorded with SNP at 50 μ M (80.7% and 99.2% after 7 and 14 days of sowing respectively) as compared to control (60% and 75.7% after 7 and 14 days of sowing respectively). At the 14th day and 21st day of storage, a significantly ($p < 0.05$) higher germination percentage was recorded with SNP at 50 and 100 μ M when compared to control and mock treatment (hydropriming) after 21 days of sowing. There was no significant difference in growth attributes viz., stem diameter, shoot height, number of leaves, leaf area, internodal length, chlorophyll content, dry weight of roots and shoots of seedlings raised from seeds imposed with different treatments after two months from planting. Therefore, NO treatment at 50 and 100 μ M concentrations could effectively be utilized to improve the germination and short-term storage life of rubber seeds.

Keywords: Germination, Nitric Oxide, Rubber, Sodium Nitroprusside