Natural Rubber Research, 20 (1&2): 94-107, 2007 REVIEW ARTICLE

ROOTSTOCK-SCION RELATIONSHIPS IN BUDGRAFTED PLANTS WITH SPECIAL REFERENCE TO *HEVEA BRASILIENSIS*

P. Sobhana, James Jacob and M.R. Sethuraj
Rubber Research Institute of India, Kottayam 686 009, Kerala, India

Submitted: 10 February 2006 Accepted: 27 July 2007

Sobhana, P., Jacob, J. and Sethuraj, M.R. (2007). Root stock-scion relationships in budgrafted plants with special reference to *Hevea brasiliensis*. *Natural Rubber Research*, 20 (1&2): 94-107.

Although known to man for several centuries, the art of grafting has been first used in modern agriculture to perpetuate desirable phenotypic traits in fruit crops in Europe during the fifteenth century. Since the beginning it has been known that while the scion characteristics could be maintained, the rootstocks also played a major role in the growth and development of the scion. One of the most pronounced effects of rootstock has been in reducing the scion tree size and altering its shape, and this has been commercially exploited in crops like apple by the use of dwarfing rootstocks.

Bud grafting is the most popular means of propagation in *Hevea brasiliensis*, the natural rubber tree. There are no rootstock options available in rubber cultivation unlike in several fruit crops. The rootstocks of *H. brasiliensis* are grown from highly cross-pollinated seeds that have different genetic lineages. Rootstock heterogeneity has been known to be a source of intra-clonal variability in growth and yield in *H. brasiliensis*. It is suspected that the differences in the genetic make up between the rootstock and scion leads to subtle interactions, or "genetic conflict" between them. Such conflicts may gradually reflect at all levels of tissue organization- from the molecular to the phenotype levels of the scion.

Though generally considered to be an adverse factor, the rootstock effects could also be positive in terms of growth and development of the scion or endurance to environmental stress. But no attention has been made so far to exploit such positive rootstock-scion interaction in *H. brasiliensis*. A clear understanding of the stock-scion relationships can help us to identify the right combination of stock and scion for the best agronomic performance of the tree. This study reviews stock-scion interactions and discusses the need to focus on exploiting ideal stock-scion combinations in rubber cultivation.

INTRODUCTION

Grafting is a popular method of vegetative propagation in several horticultural species. By this technique two plants with different genetic make-up are joined together to form and function as a new single plant. The upper portion or top of the plant (shoot) is known as scion and the lower portion (root) is called stock or rootstock. Due to the asexual nature of this technique, the traits of the scion are perpetuated without any change. The Chinese had been practicing this technique since 1000 BC and the Greeks were familiar with it since the times of Aristotle (Rom 1987). It became a popular mode of propagation during the fifteenth century in Europe primarily to multiply scions of fruit crops with desirable pomological characteristics and the most important consideration for selecting a rootstock has

Correspondence: P. Sobhana (Email: sobhana@rubberboard.org.in)