

POROUS ROOT RESTRICTIVE MEMBRANE REGULATES GROWTH AND YIELD OF MANGO (*MANGIFERA INDICA* CV. CHOKANAN) GROWN UNDER FIELD CONDITION

Siti Zaharah Sakimin* & Mohd. Razi Ismail

Department of Crop Science, Faculty of Agriculture, Universiti Putra Malaysia, Serdang 43400, Malaysia and Institute of Tropical Agriculture and Food Security (ITAFoS), Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

szaharah@upm.edu.my*, razi@upm.edu.my

ABSTRACT

Root is a major vegetative organ involving in the uptake of essential nutrients and other substances for plant growth and development. Enhancement in root growth and nutrient uptake are key factors in increasing shoot growth; however, growing under confined area will limit their growth and reduce the performance of yield. A study was conducted to investigate the effect of porous root restrictive membrane on growth and yield of mango (*Mangifera indica* cv chokanan) grown under field conditions. Two-year old young mango seedlings were subjected to different volumes of porous root restrictive membrane (two root restrictive membrane treatments, 636.33 cm³ and 1336.3 cm³, and control-without membrane) with the planting distance of 3 m x 3 m in MARDI Jeram Pasu, Pasir Putih, Kelantan. The experiment was arranged in a Randomized Complete Block Design (RCBD) with fourth plant and replicated eight times. The result revealed that plants restricted in 636.33 cm³ showed 23%, 14%, 24.65%, 61%, 58.84%, 46.88%, 56.85%, 48.40%, 30.5%, 43.83%, 54.91%, and 60.72% less in plant height, stem diameter, leaf area index, total leaf area, leaf fresh weight, stem fresh weight, leaf dry weight, stem dry weight, root dry weight, root length, root surface area, and average root diameter respectively than unrestricted plants (control). Besides, small volume membrane had smaller (50%) in number of fruits compared to unrestricted root in the first harvest, while in the second harvest, control treatment had significantly decreased (62.5%) in number of fruits compared to 636.33 cm³ restricted root volume size. However, the second yield showed that total fruits in the small restricted root volume treatment had significantly increased 2 and 3-fold compared to medium root restricted volume and control respectively. Average fruit weight per plant was unaffected in first and second yield but slightly increased 636.33 cm³ in the restricted root volume treatment for the second yield. This result demonstrated that controlling soil volume could effectively reduce plant size, increase continuous flowering and enhance yield in the next harvest season. In conclusion root restriction technique system could be used in agriculture to control plant vigour and to stimulate flowering and fruiting production.

Keywords: geotextile membrane, growth, plant vigorous, root characteristic, yield, Chokanan mango