

Bencharong Phuangrat 2011: Plant Fitness Comparison between Transgenic *Papaya Ringspot Virus* (PRSV) Resistant and Non-Transgenic Papaya under Screenhouse Condition. Master of Science (Agricultural Biotechnology), Major Field: Agricultural Biotechnology, Interdisciplinary Graduate Program. Thesis Advisor: Mrs. Parichart Burns, Ph.D. 81 pages.

Commercialization of genetically modified organisms (GMOs) commonly called transgenic organisms raises public concerns over possible adverse effects to the environment and human health. Among the environmental concerns, attention is focused on ecological risk of gene flow from GM plants to wild/cultivated species. There are two main factors contributing to transgene movement; plant fitness and reproductive characteristics especially in pollen. Plant fitness can be measured by determination of horticultural and agronomic characters such as plant morphological characteristic, yield and numbers of seeds. Reproductive character is determined via pollen viability and pollen germination at given time (pollen vigor). In this study, *papaya ringspot virus* (PRSV) resistant papaya lines p116/5 R₄ and R₅ previously shown to be homozygous line and highly resistant to almost all Thai PRSV strains was evaluated for fitness and reproductive characters in closed containment. The experiment was carried out for two consecutive seasons, with complete randomize design (CRD). The results showed that there was no significant difference in any agronomical characters including growth rate, fruits production as well as pollen biology. There was no significant difference in pollen viability and germination as well as in shape, size and weight among pollen grains from transgenic and non-transgenic papaya counterpart. In addition, sensitive polymerase chain reaction (PCR) based method was developed to detect transgene in pollen grains, a mobile male reproductive organ. It can be concluded that under closed containment condition both transgenic and non-transgenic papaya show similar plant fitness and pollen biology.

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