

Metinee Ploypleansang 2010: An Inheritance of Root-Knot Nematode Tolerance Trait in Guava (*Psidium guajava* L.). Master of Science (Agriculture), Major Field: Horticulture, Department of Horticulture. Thesis Advisor: Associate Professor Unaroj Boonprakob, Ph.D. 101 pages.

The most serious problem for the guava plantation in Thailand is the root-knot nematode (*Meloidogyne incognita*). Tolerant rootstock used is the most efficient practice to prevent infection. The objectives were to evaluate the mode of gene action and inheritance of root-knot nematode tolerance trait in guava. Four root-knot nematode tolerant varieties: 'Xa'li', HORT-R1, 'Taiwan' and 'India' and 4 susceptible varieties: 'Alla Habad Safeda', 'Thai', 'Klom Salee' and 'Beaumont'. The 8 varieties were crossed in a diallel plan resulting in 36 crosses from selfing and crossing. Progeny were planted in 6-inch sized plastics pot containing sterilized sandy-loam soil and were tested for root-knot nematode tolerance using 400 J<sub>2</sub> 'Nakhon Pathom' and 'Phetchaburi' isolate of *Meloidogyne incognita* when seedlings were 11 months old in greenhouse for 60 days. The experimental design was completely randomized design (CRD). The root-knot nematode tolerance trait was recorded as number of gall and egg. The genetic effect in combining ability was analyzed using the Method II model I, Griffing (1956) while the heritability was estimated in narrow sense ( $h^2$ ) using the mid-parent offspring regression. The results showed that the inheritance of root-knot nematode tolerance in guava was expressed as a quantitative trait with a additive gene action (GCA) and non additive gene action (SCA). The GCA had greater role in controlling this trait because the GCA: SCA was 3.9:1 in the gall number and 4: 1 in the egg mass number. The estimated narrow sense heritability was moderate in the gall number (0.63) and high in the egg mass (0.84). Based on the study HORT-R1 and 'Xa'li' had the lowest gall and egg mass numbers of root-knot nematode and best general combining ability and therefore they should be used as parents in breeding the guava for the root-knot nematode tolerance

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