

**THE EFFECT OF ROOTSTOCKS ON GROWTH,
DEVELOPMENT AND FRUITING OF TRANG NGUYEN
PAPAYA VARIETY**

Nguyen Trinh Nhat Hang, Nguyen Minh Chau

Southern Fruit Research Institute

Box: 203 My tho, Tien giang, Viet nam.

INTRODUCTION

Papaya (*Carica papaya* L.) native to tropical American, and distributed worldwide. Papaya has long been know an important fruit to people in the ASEAN countries (Chin and Yong, 1980, Signh, 1980, Muthukrishnan and Irulappan, 1985). In Viet nam, papaya was planted in the West and East (the South of Viet nam) viz. Tien giang, Dong thap, Can tho, Kien giang, Dong nai ... in the small area and the home garden. Besides providing food, the economic value of the crop has potential to be exploited as an income generator (Rohani, 1994). It is one of the fruit with fruit throughout the year, gives quick return and adaptes itself to diverse soil and climatic condiction.

The most of common method of propagation of papaya is from seed. However, the vegetative method preserves the characters of the mother plants in their progencies as cutting (Naik, 1946; Allan, 1964; Mukherjee and Mazumdar, 1972), grafting (Jimmez, 1957; Riccelle, 1963 and Lange, 1969). Stambaugh (1960) was reported that the multiple top Blue Solo papaya in an effort to

produce more fruit of uniform size and closer to the ground for easy harvesting . Sheen et al.1999 study the effect of grafting on the fruiting of TaiNung No.2 and TaiNung No. 5 papaya varieties shown that grafted plant had a tendency of being shorter than ungrafted seedling.The present study effect of rootstocks on growth development and fruiting of Trang Nguyen papaya variety with following objective:

To study the varietal rootstocks which respect to the percentage of success, establishment of grafting and further growth of grafted plant of Trang Nguyen papaya.

MATERIALS AND METHODS

The present investigation was conducted in the net house and the orchard of Southern Fruit Research Institute (SOFRI) during 1999-2001.

Number of varieties:

Six varieties of papaya were selected as rootstocks viz. Dai loan tim (introduce from Taiwan), Dai loan tim (local var.), Hong kong da bong (Viet nam), Eksoticka (Malaisia), Kaegdum (Thailand) , Papaya LD-99 (from abroad) and one variety Trang Nguyen was used for scion.

Seedling of Trang Nguyen variety is control.

1.2. Selection and preparation of the scion

Healthy, disease free , uniform of Trang Nguyen var. were growed in the net house for taking scion.

Length of scion is 3cm containing two nodes. Fourty five days old rootstock of each above varieties were grafted at 10cm height by Top grafting method.

Grafting was done in March, April.

The grafted plants were kept in shade and covered with polythene bag to reduce respiration.

1. Experiment No.1:

The effect of rootstocks on the percentage of survival and growth parameters of top grafting of papaya.

1. Raising of rootstock for grafting

Healthy, ripening of papaya fruit of six varieties viz. Dai loan tim, Dai loan tim (local var.), Hong kong da bong, Eksoticka, Kaegdum, Dudu Malai were collected for seedling.

The seeds were sown in the trays filled with soil and organic manure. A thin layer of sand was spread evenly on the surface of trays. The trays always keep moist.

Uniform healthy vigorous seedling with straight, stout epicotyl were selected for rootstock.

They were transplanted in polythene bag (12cm x18cm), filled with mixture of organic fertilizer, sand and soil (1:1:1).

After transplanting, the seedling were kept under net house and irrigated.

When seedling are 45 days can be used for grafting.

1.3. Observation

i/ Percentage of survival :

The scion remain green, whether sprouted or unsprouted.

The data were recorded at 7 days of grafting to calculate the initial success and the scion that actually sprouted and survived after 21 days of grafting was counted for calculating the final success .

ii/ Number of new leaf :

Number of leaves produce by the the scion was recorded 30, 45 days after grafting .

2.Experiment No.2:

Effect of rootstock on the growth, development and fruiting of Trang nguyen papaya variety.

2.1 The varieties used as root stock

1. Dai loan tim (Taiwan) (DLT1)
2. Dai loan tim (local var.) (DLT2)
3. Hong kong da bong (local var.) (HKDB)
4. Eksotica (Malaisia)
5. Papaya LD- 99 (from abroad)
6. Khaek dam (Thailand)
7. Trang Nguyen (seedling)

The Trang Nguyen variety was taken for grafting and grafted onto the root stock varieties above.

2.2 Observation :

Plant height (cm) after transplanting in the field .

Trunk diameter (cm).

Height of initial flower (cm).

Height of first fruit (cm).

Fruit number of plant (Normal fruit and abnormal fruit)

Statistical analysis

The experiments were laid out in Randomized Completely Block design.

Anova was calculated to separate the means.

RESULTS AND DISCUSSIONS

3.1 .Effect of root stock on the percentage survival of grafting plant and the growth of plant after grafting.

The scion remain green , sprouted and leaf growth after grafting (Fig 1)

The percentage survival of grafting plant had recorded at 7, 15 and 21 days after grafting . Maximum success (83.91 % and 75.15%) was recorded for Papaya LD-1999 (from abroad) at 7 and 15 days which are statistically on par with 77.87%, 71.74%, 58.93%, 57.81%, 52,65% and 66.38%, 57.81%, 52.84%, 52.46%, 50.20% . The percentage success of grafting plant at 15 days and 21 days were constant.

Table1 : The effect of rootstock on percentage survival of grafting plant at different stages (SOFRI, 2001)

Rootstock	The percentage survival of grafting plant (days after rafting)		
	7 days	15 days	21 days
DLT ₁	77.87ab	66.38ab	66.38ab
HKDB	58.93 bc	50.20 b	50.20 b
EKSOTICA	57.81 bc	52.84ab	52.84ab
Papaya LD-1999	83.91a	75.15a	75.15a
KAEG DUM	52.65 c	52.46 b	52.46 b
DLT ₂	71.74abc	57.81ab	57.81ab
CV%	19.9	22.5	20.9

Means within each colum followed by the same letter are not significantly at 5% level by duncan multiple range test.

Table 2. The effect of rootstock on growth and development of plant heigh and leaf number of Trang nguyen papaya grafting (45 DAG)(SOFRI, 2001)

Root stock	Heigh of plant(cm)	Number of leaf / plant
DLT1	50.1	10.0
DLT2	46.6	9.0
HKDB	46.9	9.3
EKSOTICA	52.3	10.7
PapayaLD-99	44.9	12.0
KAEG DUM	41.9	10.3
CV%	9.8	12.2

The present data in the table 2 shown that there were no significant difference in the heigh of plant and number of leaf at 45 days after grafting among the rootstock varieties.

Table 3: The effect of rootstock on height of plant , trunk diameter of grafting plant (SOFRI, 2001)

Root stock	Plant height (cm) and trunk diameter (cm) after transplanting			
	15 DAT	30 DAT	45 DAT	Trunk diameter(cm)
DLT1	56.2	65.7ab	86.2ab	14.0 bc
DLT2	54.8	64.9ab	84.3 b	14.6 b
HKDB	58.4	66.8ab	85.2ab	13.7 bc
EKSOTICA	54.8	64.5 b	85.5ab	14.1 bc
PapayaLD-99	53.2	60.2 b	74.6 c	19.9 a
KAEG DUM	50.0	64.0 b	74.9 c	15.5 b
Seedling	58.3	76.7a	91.7a	12.8 c
CV%	9.3	2.4	6.5	5.6

Means within each colum followed by the same letter are not significantly at 5% level by duncan multiple range test.

The height of grafted plants at 15 days after transplanting were no significant different when compare to control. However, there were significant different at 30 and 45 days after transplanting. The PapayaLD-1999 and Kaegdum gave grafting plant heigh (60.2 and 74.6cm; 60.4 and 74.9cm) shorter than seedling (76.7 and 91.7cm) respectively.

Table 4: The height of initial flower and first fruit in Trang nguyen papaya grafting plant (SOFRI, 2001)

Rootstock	Height of initial flower (cm)	Height of first fruit (cm)
DLT1	80.1a	99.3 bc
DLT2	80.8a	102.3ab
HKDB	76.8ab	83.3 d
EKSOTICA	77.5ab	83.9 cde
PapayaLD-99	66.9 c	77.1 e
KAEG DUM	68.7 bc	79.3 de
Seedling	84.3a	110.9a

Means within each column followed by the same letter are not significantly at 5% level by Duncan multiple range test.

The data present in table 4 shown that there were significant difference in height of initial flower and height of first fruit. The Papaya LD-1999 give height of initial flower and height of first fruit (66.9cm and 77.1cm) shorter than seedling (83.3 cm and 110.9 cm).

There was no significant different in fruit yield among the root stocks and seedling (Fig 2)

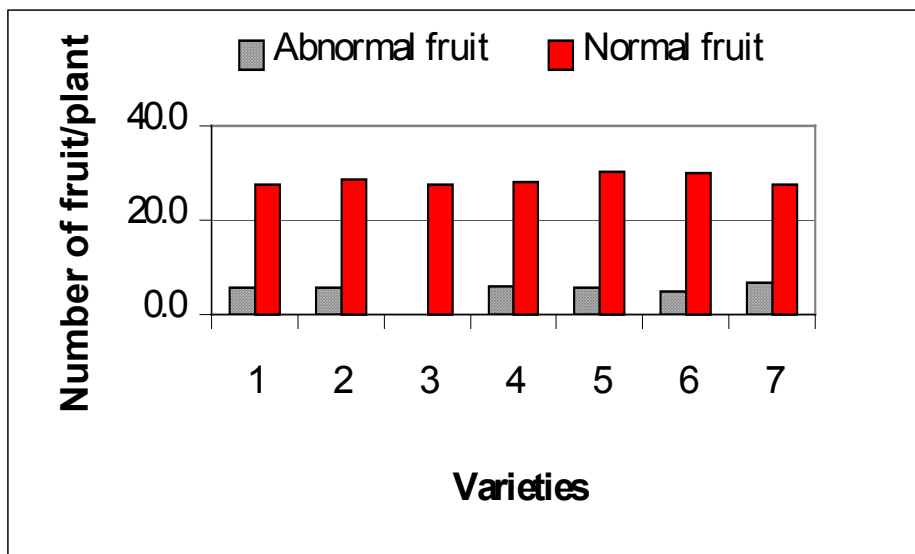


Fig2 :The fruit yeild of Trang nguyen grafting papaya

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SUMMARY

In other study effect of grafting on growth, development and fruiting in Trang Nguyen papaya variety. Young seedling of six varieties were selected as rootstock. The Trang Nguyen variety was grafted onto the rootstocks above. Their plant survival, plant growth and fruiting were investigated. The result showed that among of the varieties using as rootstock. The varieties PapayaLD-1999 (from abroad) gave highest percentage survival. There are significant differences in height of plant and in initial height of fruit ,Trang Nguyen grafted onto PapayaLD-1999 and Kaedum varieties gave shorter than seedling. The number of fruit yield had no significant differences between the grafted and seedling plant.

