

Survival and growth of potted mango budgrafts

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SUMMARY

An experiment was carried out at Kwadaso between 12 Dec 1984 and 5 Mar 1985 to study the effect of potting on survival and growth of five mango cultivars: Sunset, Earlygold, Palmer, Keitt and Haden. It was observed that Keitt and Palmer responded more favourably to potting in terms of budding survival, growth and development than the rest. Mean percent survival of the different cultivars were: Keitt (75.6), Palmer (70.8), Earlygold (45.4), Haden (35) and Sunset (30). The results for scion height and spread were also in the same order for the cultivars. It is recommended that in view of the generally low survival rates of some mango budgrafts, only polybag-grown plants may have to be supplied from F.T.C.P. nurseries in the future. If that becomes impracticable, then preference would be given to those cultivars that have been found to transplant relatively better viz., Keitt and Palmer.

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Introduction

Over the years, the vast quantities of mango budgrafts supplied from the Crops Research Institute's nursery at Ejura had been produced by budding scions from exotic cultivars on ground-grown local rootstock material. When these plants were uprooted and sold to clients, the reported mortality rates were found to be alarmingly high and buyers' complaints were deafening and sarcastic at times. As a short-term measure, it became necessary to determine whether potting up budgrafts prior to mass distribution would be the answer. If that succeeded, then all future plants would be produced in containers, particularly polybags.

This study was, therefore, a preliminary attempt

RÉSUMÉ

ADDAE-KAGYAH, K. A.: La survivance et la croissance de bourgeon greffes de mangue mises en pots. Une expérience a été faite à Kwadaso du 12 Dec.1984 au 5 Mars 1985, afin d'étudier l'influence de poterie sur la survie et la croissance de cinq variétés de mangue cultivées: Sunset, Earlygold, Palmer, Keitt et Haden. On a constaté que Keitt et Palmer poussent plus favorablement dans le pot que les autres, à l'égard de la survivance, la croissance et le développement de la bourgeon. Les moyennes de pourcentage de la survie de variétés cultivées étaient: Keitt (75.6), Palmer (70.8), Earlygold (45.4), Haden (35) et Sunset (30). Les résultats pour l'hauteur et l'élargissement du scion suivent la même ordre de variétés cultivées. Étant donné que dans l'ensemble, la fréquence de la survie de certaines bourgeon-greffes de mangue est fiable, il est conseillé que dans l'avenir, seules les plantes cultivées dans les sacs plastique seront fourni par la pépinière de FTCP. Si cela devient impracticable, la préférence serait donc accordée aux variétés cultivées qui sont considérées relativement les meilleures à transplanter: c'est-à-dire Keitt et Palmer.

to evaluate the response of budgrafts of the more popular mango cultivars to potting prior to transplanting.

Materials and methods

An experiment in which budgrafts of five mango cultivars, namely, Sunset, Earlygold, Palmer, Keitt and Haden, were used was conducted in the particularly dry period of the year (Dec-Mar, Table 1). The ground-grown rootstocks were patch-budded on 12 June 1983 and potted up 6 months later in Dec 1984. The experiment, a randomized complete block design, was replicated four times with 30 plants per scion cultivar per replication. Twenty plots containing 600 budgrafts were involved in the study. The experimental plants were potted up

TABLE 1

Climate Data During the Experimental Period

Month	Total rainfall (cm)	Mean maximum temp (°C)	Mean minimum temp (°C)	Mean relative humidity at 1500 gmt (%)
<i>1984</i>				
Dec	0.84	30.57	20.59	54
<i>1985</i>				
Jan	0.51	31.59	22.39	56
Feb	10.09	32.62	22.57	47
Mar	4.9	32.52	22.29	55

on 12 Dec 1983 in 23 cm × 28 cm 004-gauge black polyethylene bags. The potting soil was ordinary friable forest loam, Ph 6.8 and colour dark brown, 7.5 YR 4/4 on the Munsell (1954) chart. Records were taken on 24 Jan, 14 Feb and 5 Mar 1984 i.e. 6, 9 and 12 weeks after potting. Records were taken of percent survival, plant spread, and plant height (measured from the base of the scion upwards).

Results and discussion

Survival

Of the five cultivars tested, Keitt and Palmer were superior ($P < 0.01$) in terms of survival followed by Earlygold, Haden and Sunset in descending order (Table 2). The results undoubtedly con-

TABLE 2

Mean Percent Survival of Budgrafts

Cultivars	6th week	9th week	12th week
Sunset	35.54	32.5	30
Earlygold	41.24	42.48	45.4
Palmer	74.98	73.93	70.8
Keitt	84.56	82.26	75.6
Haden	44.98	46.65	34.99
<i>Cultivar means</i>	55.86	55.56	51.36
LSD (0.05)	12.49	12.54	13.7
(0.01)	17.53	17.6	19.22
S.E.	±4.05	±4.06	±4.44
C.V.	14.5%	14.63%	17.29%

firmed clients' reports that the various cultivars have different survival abilities. It was evident that Sunset and Haden transplanted so badly that only potted material could be sold. Earlygold exhibited an interesting phenomenon by rather gaining in survival rate progressively from week 6 onwards (41.24 - 45.4 %). What happened was that some individual plants that showed evidence of death and were thus recorded later regenerated. It was rather remarkable that the two most popular cultivars of all, namely, Keitt and Palmer, were also the most hardy. The two survived transplanting shock three times better than Sunset and Haden and one and a half times better than Earlygold.

Scion height

Keitt proved the most vigorous grower ($P < 0.01$) having gained a mean height of 41 cm at the end of week 12 (Table 3) compared with 16.1 cm of Sunset, 17.7 cm of Earlygold, 30.7 cm of Haden and 32.4 cm of Palmer. Sunset rather declined, losing an average of 2.95 cm over the 6-week period between weeks 6 and 12. This was to be explained in terms of the progressive deaths of some of the best

TABLE 3

Mean Scion Height (cm)

Cultivars	6th week	9th week	12th week
Sunset	19.05	18.41	16.1
Earlygold	19.64	15.33	17.67
Palmer	28.54	31.64	32.37
Keitt	37.46	38.74	40.93
Haden	29.96	29.4	30.67
<i>Cultivar means</i>	26.33	26.7	27.55
LSD (0.05)	5.27	4.86	7.03
(0.01)	7.4	6.85	9.85
S.E.	±1.71	±1.58	±2.3
C.V.	12.99%	11.84%	16.55%

individual plants of that cultivar during that period.

Plant spread

Palmer was the most spreading cultivar (Table 4)

TABLE 4
Mean Scion Spread (cm)

Cultivars	6th week	9th week	12th week
Sunset	23.36	20.16	28.83
Earlygold	29.01	31.01	35.53
Palmer	34.6	37.25	40.19
Keitt	31.15	34.17	37.6
Haden	27.15	30.46	33.42
<i>Cultivar means</i>	29.06	30.61	35.11
LSD (0.05)	6.19	4.77	6.06
(0.01)	8.69	6.7	8.51
S.E.	±2.01	±1.55	±1.97
C.V.	13.83%	10.13%	11.22%

followed by Keitt, Earlygold, Haden and Sunset in that order. Almost all the plants tended to spread more than to develop vertically, a fact which was reflected in the higher final means for plant spread than for height.

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REFERENCE

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