
Influence of harvesting day and potassium chloride on sweetness of melon grown in plastic house

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Abstract The result found that melon increasing in height according to increasing of planting date. On harvesting day therefore significantly difference among treatment in TSS and TA content of juice. The most TSS content of juice extract with the mean of 16.33 °brix received from those melon fruit treated with KCL 5 gram + 50 day harvested and showed significantly difference among treatment. The second and the lowest TSS content got from those treated with 36day+KCL 3g/pot 50days and 45 days harvested with the mean of 16.20 and 15.07 °brix respectively. The fruit weight had a range 2293.30 to 2405.30 gram while there is less impact on the fruit volume, fruit circumference flesh and peel thickness. The harvesting date 50 days shown more pronounce effect on TSS content of fruit juice than 45 days harvested on the other hand harvesting date also had influence of L* and a* on flesh melon grown in plastic house.

Keywords: melon, harvesting, potassium chloride, plastic house

Introduction

Food quality becomes mainly research approach. Melon (*Cucumis melo* L.) is rich in minerals, carbohydrates, vitamins and dietary fiber (IPGRI, 2003). The market acceptability are sweetness and palatability of melon that is needed for the customer especially, Thai people and Asian cluster (Lignou *et al.*, 2014). The proper mineral nutrition of plants is importance to improve yield components and quality in melon production. Several studies reported the importance of NPK application to melon plants. NPK application to melon plants increase their growth (El-Deruki *et al.*, 2000) and improved yield and fruit quality such as fruit size, fruit weight and flesh thickness etc. Under plastic house condition, the melon plants applied with 100kg N + 64kgP₂O₅ + 64kg K₂O showed the highest increasing in plant height, fruit weight size and quality (Mitchelle *et al.*, 2012; Castellano *et al.*, 2008) but TSS and moisture contents were not affected (Shafeek *et al.*, 2015). Mengel and Kirkby (1978) stated that the attribution of increasing in NPK availability and their uptake to obtain the goal with similarly to the studies of Ferrante *et al.*, (2008); Wang and Sun, (2008). The objectives this study to determine harvesting day and rates of potassium chloride to sweetness of melon.

Materials and methods

A completely randomized design (CRD) with 6 treatments and 3 replications. Treatments were as follows: 1) 45 day before harvest + 15-15-15 at 9 g per pot per week, 2) 50 day harvested + 15-15-15 9 grams per pot per week, 3) 30 day + 15-15-15 9 grams per pot per week + KCL 3 g per pot per day 45 days harvested, 4) 36 day + 15-15-15 9 grams per pot per week + KCL 3 g per pot per day 50 days harvested, 5) 30 day + 15-15-15 9 g per pot per week + KCL 5 g per pot per day 45 days harvested and 6) 36 day + 15-15-15 9 g per pot per week + KCL 5 grams per pot per day 50 days harvested.

The 7 day of melon #20 orange flesh seedling was transplanted in white plastic bag 14 inch in diameter, in container filled up with soil + manure and mixed well. After one week all treatments were treated as treatment stated above.

The melon plants flowers on 20-27 days from transplanted. Hand pollination was done in early morning and one fruit was maintained per plant.

Data were collected as Fruit quality and quantity measurement. Plant growth was monitored weekly in term of height increment and leaf chlorophyll content. Plant height was determined using a measuring tape starting on the second weeks after transplanting up to two weeks before harvest. Chlorophyll content was measured using SPAD-502 chlorophyll meter (Minolta Camera Co., Japan) the leaf measured was leaf no.9 (about four weeks after transplanted up to four weeks before harvest).

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On 50 days after fruit setting melon fruits were harvested and then the data below were recorded. Fresh weight (g), fruit volume (ml), fruit circumstancs (cm), flesh thickness (mm), peel thickness (mm), fruit firmness (newton), TSS content (°brix), TA content (%) and L* a* and b*.

Results

Wine height; according to this study melon wine increased in height corresponding to time increased. The increment more rapidly during 14 days to 35 days after planting or before fruit setting and then wine growing slow down up to fruit harvested. The height of wine showed non significantly difference the mean of wire height about 185.70 to 190.00 cm.

After fruit setting, fruit growth habitat raise rapidly up to these weeks on around 45 days often gradually deceased after transplanting then enlargement of fruit slow down according to increment of days after fruit setting; Fruit fresh weight and fruit volume, fruit circumstancs, flesh and peel thickness, A side from table 1. indicated that all of these characteristics were not significantly difference, therefore such as fruit weight flesh and peel thickness were well accepted. The fruit fresh weight had a range of 2293.30 g. to 2405.30 g. while the flesh and peel thickness had a range of 26.11 mm. to 27.71 mm. and 7.69 mm. to 8.18 mm. respectively. This experiment also trend to show that more mature get more flesh and peel thickness and more fruit weight also.

Total soluble solid content of flesh juice (TSS) titratable acidity and fruit firmness are the importance characteristics of melon effected on the consumer buying decision. According to table 2 it indicated that TSS from those fruits applied with KCl and harvested on 50 days after fruit setting gave more TSS content and lesser fruit firmness. The highest TSS content got from melon flesh juice applied with KCl 5 g per pot per day and harvested on 50 days after fruit setting with the mean of 16.33 °brix while the lowest TSS content received from those applied with 15-15-15 9 g per week per pot and harvested on 45 days after fruit setting with the mean of 15.07 °brix and showed significantly difference. The titratable acidity of melon flesh juice had a range of 0.19 to 0.25 percent and showed non significantly difference.

Table 1. Shown fresh weight (g), fruit volume (ml.), fruit circumference (cm.), flesh thickness (mm.) and peel thickness (mm.) melon grown in plastic house.

treatment	fresh weight (g)	fruit volume (ml.)	fruit circumference (cm.)	flesh thickness (mm.)	peel thickness (mm.)
15-15-15 9g/pot/week + 45day	2293.30a	2273.30a	53.67a	26.11a	7.69a
15-15-15 9g/pot/week + 50day	2310.00a	2292.00a	54.33a	26.54a	7.93a
15-15-15 9g/pot/week + 30day + KCl 3g + 45day	2315.00a	2339.00a	55.33a	26.97a	7.95a
15-15-15 9g/pot/week + 36day + KCl 3g + 50day	2363.30a	2399.70a	56.00a	27.62a	8.15a
15-15-15 9g/pot/week + 30day + KCl 5g + 45day	2386.70a	2386.70a	55.67a	27.18a	8.02a
15-15-15 9g/pot/week + 36day + KCl 5g + 50day	2405.30a	2407.00a	56.33a	27.71a	8.18a
F-test	ns	ns	ns	ns	ns
C.V. (%)	5.93	6.63	3.67	8.75	5.45

Note ns =non significant difference

Palatability score; on harvesting date the firmness of fruit these harvested on 45 days after fruit setting showed more harder than those fruits harvested on 50 days (table 2). Palatability of flesh melon increased according to the increasing of days after fruit setting as persent in table 3. otherwise the flesh firmness decreased while the palatability increased as same as TSS of flesh juice increased due to the loose of calcium prctate become soluble form.This table 3 also presents that melon fruit harvested on 45 days and 50 days were accepted in palatability and aroma also.

Table 2. Shown fruit firmness (newton), TSS content (°brix) and TA content (%) melon grown in plastic house.

treatment	fruit firmness (newton)	TSS content (°brix)	TA content (%)
15-15-15 9g/pot/week + 45day	44.02a	15.07c	0.20b
15-15-15 9g/pot/week + 50day	41.42a	15.33b	0.19b
15-15-15 9g/pot/week + 30day + KCl 3g + 45day	42.22a	15.13c	0.22ab
15-15-15 9g/pot/week + 36day + KCl 3g + 50day	41.17a	16.20a	0.22ab
15-15-15 9g/pot/week + 30day + KCl 5g + 45day	41.97a	15.73ab	0.24a
15-15-15 9g/pot/week + 36day + KCl 5g + 50day	41.12a	16.33a	0.25a
F-test	ns	*	*
C.V. (%)	10.65	2.8	9.93

Note ns = non significant difference statistically significant

* = significant difference at 0.05 level.

Table 3. Shown L*, a* b* and palatability score of flesh melon grown in plastic house.

treatment	L* of flesh	a* of flesh	b* of flesh	palatability score
15-15-15 9g/pot/week + 45day	64.34a	11.92a	50.53a	4.00a
15-15-15 9g/pot/week + 50day	64.74a	12.33a	25.62a	5.00a
15-15-15 9g/pot/week + 30day + KCl 3g + 45day	64.62a	12.38a	25.76a	4.50a
15-15-15 9g/pot/week + 36day + KCl 3g + 50day	64.90a	12.44a	26.80a	5.00a
15-15-15 9g/pot/week + 30day + KCl 5g + 45day	64.72a	12.40a	26.28a	4.00a
15-15-15 9g/pot/week + 36day + KCl 5g + 50day	65.12a	12.60a	16.97a	5.00a
F-test	ns	ns	ns	ns
C.V. (%)	2.85	8.01	6.33	0.00

Note ns =non significant difference at 0.05 level.

According to figure 1. and table 3. indicated that the internal and physical appearance of melon fruit harvested on difference date and various KCL fertilization were well accepted include L* a* and b* of flesh and palatability score.

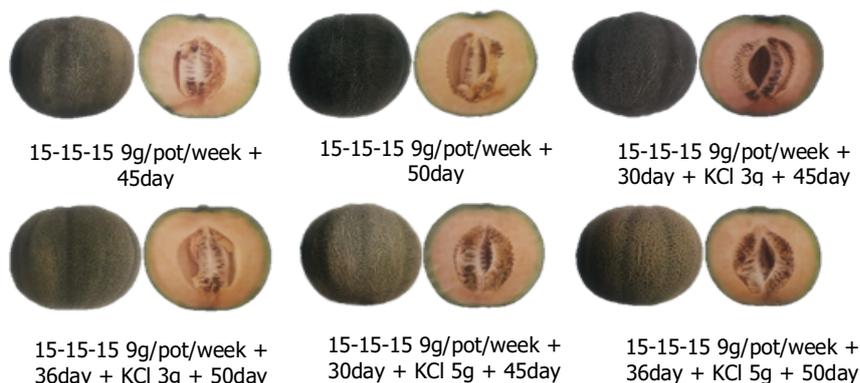


Figure 1. The internal and physical appearance of melon grown in plastic house.

Discussion

Melon fruits those supplementary with KCL showed more TSS content than the other treated with 15-15-15 only because of KCL will enhance the activity of enzymes those invert the media to sugar this finding similar to the study of Wang *et al.* (1996). Further more harvest maturity pronounced effect on TSS of melon juice more maturity give more TSS content. Those results similar to the study of Fellman *et al.* (2003) and the report of Song and Bangerth (1996) who study on Golden Delicious apple. The cultivation of melon should applied with KCL and harvest more maturity in order to receive more quality.

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