Original article

Effect of some growth regulators on some fruit characteristics and productivity of the Barhee date palm tree cultivar (*Phoenix dactylifera* L.)

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Abstract — **Introduction**. The date palm tree is one of the fruit trees most cultivated in the Arabian Gulf States. Bioregulators were used for the quality and productivity improvement of date palm tree fruits. A study was conducted to assess the relative effectiveness of GA_3, NAA, ethephon and a mixture of growth regulators on some fruit characteristics and productivity of the Barhee date palm tree cultivar. **Materials and methods**. Five selected female uniform date palm trees of the cultivar Barhee were pollinated on March 5–15, 1994, 1995 and 1996, by placing eight fresh male strands on the female spadix center (flower cluster).Ten flower clusters were used on each tree and divided into five groups of two flower clusters. Each of these groups was subjected to one of the following treatments: control (water), 150 mg $GA_3 \times L^{-1}$, 100 mg NAA $\times L^{-1}$, 1 000 mg ethephon $\times L^{-1}$ and a mixture of these three growth regulators. Then the fruit setting, fruit flesh and dry matter percentages, the total soluble solids, the fruit ripening, and the fruit weight per bunch and per tree were measured. **Results and discussion**. The data showed that the application of GA_3 or ethephon on flower clusters of Barhee date palm trees had no constant effect on fruit characteristics and productivity of trees. NAA or growth regulator mixture applications on Barhee flower clusters reduced the fruit dry matter and fruit ripening percentages and increased the fruit weight per bunch and per tree. **Conclusion**. Treatments of Barhee date palm flower clusters, 20 d after pollination, with NAA or the specific growth regulator mixture decreased the dry matter percentage and the fruit ripening and increased the fruit flesh percentage and the date palm tree yield, therefore, these treatments could be recommended to improve the productivity of date palm trees in the region.

Gulf States / *Phoenix dactylifera* / plant growth substances / spraying / nutrient improvement / crop yield

Effet de quelques régulateurs de croissance sur certaines caractéristiques de production du cultivar Barhee de palmier dattier (*Phoenix dactylifera* L.).

Résumé — **Introduction**. Le palmier dattier fait partie des arbres fruitiers les plus cultivés dans les États du Golfe arabe. Des biorégulateurs ont été utilisés pour améliorer la qualité des dattes et la productivité de l'espèce. Dans ce contexte, une étude a été entreprise pour évaluer l'efficacité relative de l'acide gibbérellique (GA_3), l'acide naphtalène acétique (ANA), l'éthéphon et d'un mélange de ces régulateurs de croissance sur certaines caractéristiques du fruit et sur la productivité de palmiers dattiers du cv. Barhee. **Matériel et méthodes**. Cinq palmiers dattiers Barhee homogènes et femelles ont été pollinisés du 5 au 15 mars pendant les années 1994, 1995 et 1996 en plaçant huit brins mâles frais au centre d'une hampe femelle (inflorescence). Dix inflorescences ont été utilisées sur chaque arbre et réparties en cinq lots de deux inflorescences. Chacun de ces lots a été soumis à l'un des traitements suivants : témoin (eau), 150 mg $GA_3 \times L^{-1}$, 100 mg ANA $\times L^{-1}$, 1 000 mg éthéphon $\times L^{-1}$ et un mélange de ces trois régulateurs de croissance. Puis la nouaison, les taux de pulpe et de matière sèche du fruit, les sucres solubles totaux, la maturation du fruit, et le poids de fruit par régime et par arbre ont été évalués. **Résultats et discussion**. Les résultats ont montré que l'application de GA_3 ou d'éthéphon sur des inflorescences de palmiers dattiers Barhee n'avait pas d'effet constant sur les caractéristiques du fruit et la productivité des arbres. Les traitements des inflorescences de palmiers avec de l'ANA ou avec le mélange des régulateurs de croissance ont provoqué une réduction des taux de matière sèche de la datte et de maturation du fruit et une augmentation du poids de fruits par régime et par arbre. **Conclusion**. Le traitement des inflorescences de palmiers dattiers Barhee, 20 j après pollinisation, avec de l'ANA ou un mélange spécifique de régulateurs de croissance a diminué le taux de matière sèche, ralenti la maturation du fruit et augmenté le pourcentage de pulpe du fruit ainsi que le rendement des arbres. Ces traitements pourraient donc être recommandés pour améliorer la productivité des palmiers dattiers dans cette région.

États du Golfe / *Phoenix dactylifera* / substance de croissance végétale / pulvérisation / amélioration de qualités nutritives / rendement des cultures

1. Introduction

The past few years have witnessed significant advances in the use of synthetic and natural plant bioregulators for the improvement of crop performance in citrus [1, 2], apple [2–5] and avocado [6]. Date palm trees (*Phoenix dactylifera* L.) are among the most cultivated horticultural crops in the United Arab Emirates. The number of cultivated date palm trees in the country is estimated at about 18 million [7].

Many researchers have studied the effect of some growth regulators on yield and fruit quality of the date fruit.

Application of gibberellic acid (GA_3) in combination with hand pollination increased fruit setting percentage, [pulp / seed] ratio, average fruit weight and size [8]. Others found that the application of GA_3 decreased the seed weight, fruit weight, pulp weight, and total soluble solids (TSS) and slightly [9] or significantly delayed fruit maturation [10–13].

The naphthalene acetic acid (NAA) application on Seewy cv. date palm trees reduced the fruit yield per bunch, but increased the fruit weight, dimensions, flesh weight percentage and total soluble solids percentage [14]; nevertheless, Benjamin *et al.* [9] mentioned that the application of NAA on Zahdi and Syayer cvs. date palm trees had no effect on fruit TSS. Other auxins (2,4-DP) slightly increased the satsuma mandarin yield, but had no effect on the fruit soluble solids contents [1].

The ethephon application reduced the fruit setting of apple trees [3, 5], but increased the fruit ripening, TSS and pulp weight. Ethephon had no effect on bunch weight and yield of date palm trees [9, 15].

The objectives of this study were to assess the relative effectiveness of gibberellic acid, naphthalene acetic acid, ethephon and a mixture of these three growth regulators on certain characteristics of the fruit quality and on the yield of Barhee date palm trees.

2. Materials and methods

Field trials were conducted during three successive growing seasons (1994–1996); five selected female uniform Barhee date palm trees (*Phoenix dactylifera* L.) grown in the Kuawaytate Experiment and Research Station, Department of Agriculture and Live Stock, Al Ain, the UAE, were used. The trees were planted in sandy soil 10 m apart. All the trees were 25 years old, uniform in growth, free from insect damage and diseases, and were subjected to the same management and cultural practices.

Date palm trees were pollinated on March 5–15, 1994, 1995 and 1996, by placing eight fresh male strands on the female spadix (flower cluster) center. Ten flower clusters were used on each tree and each group of two flower clusters was subjected to one of the following treatments: control (water), 150 mg $GA_3 \times L^{-1}$, 100 mg NAA $\times L^{-1}$, 1000 mg ethephon $\times L^{-1}$ and a mixture of the three growth regulators (150 mg $GA_3 \times L^{-1}$ + 100 mg NAA $\times L^{-1}$ + 1000 mg ethephon $\times L^{-1}$).

Groups of two flower clusters were sprayed with a hand gun with the above treatments once 20 d after pollination, during the three consecutive growing seasons (1994–1996). Clusters were protected from contamination by polyethylene bags. The bags were removed after 10 d. Solutions of growth regulators were prepared in a mixture of (ethanol:water) = [8:92 (v:v)]. A nonionic wetting agent (Tween 20 surfactant) at 0.01% was included in all treatments. The experiment was arranged in a randomized complete block design with one tree plot of five replications, each replicate with two clusters.

All fruit bunches were covered at the Khalal stage (mature stage) by permeable bags to avoid bird damage and fruit shattering. Ten strands were randomly selected per replicate (five strands for each bunch) from the 40 to 50 strands that composed a bunch to determine percentage of fruit setting at 45, 90 and 135 d after the pollination (first, second and third stages of fruit development, respectively). Each bunch was tagged and labeled and the respective percentage of fruit setting per selected strand

was determined by counting the number of fruit and dividing it by the total number of the twigs on the respective strands.

Fifty fruits were randomly selected per replication to determine the fruit flesh (pulp) and dry matter percentages, and the total soluble solids (°Brix) at 90, 135 and 180 d after the pollination date (second, third and fourth stages of fruit development) [16].

Bunches were harvested 180 d after pollination. Each bunch was then weighed and all its respective fruits on all its strands were picked and separated into ripening and non-ripening fruits; the percentage of ripening fruit was determined by weighing the ripe fruits and dividing by the total weight of each replicate [7]. The total yield per tree was determined by harvesting the ten bunches from samples. The data were subjected to Duncan's multiple range test (DMR) using a MASTAT program analysis.

3. Results and discussion

3.1. Effect of the growth regulators on the fruit setting percentage

At the first stage of fruit development (45 d after pollination), application of NAA, GA_3, ethephon and a mixture of growth regulators did not affect the fruit setting percentage of Barhee date palm trees during the first and second growing seasons (1994 and 1995), whereas NAA significantly increased the fruit setting percentage, as compared to the control, during the third growing season (1996) (*table Ia*).

Table I.
Effect of gibberellic acid (GA_3), naphthalene acetic acid (NAA), ethephon and a mixture of growth regulators on the fruit setting and the fruit flesh of Barhee date palm trees, at various times after pollination corresponding to different fruit development stages, during the growing seasons of 1994–1996.

(a) Fruit setting (%)

Treatment	Number of days after pollination								
	45			90			135		
	1994	1995	1996	1994	1995	1996	1994	1995	1996
Control	83.43	74.70	79.60 b	77.86	72.15	69.45	62.89 ab	63.90	54.48
150 mg $GA_3 \times L^{-1}$	80.83	74.40	82.24 ab	71.57	69.90	62.00	57.90 b	67.40	56.20
100 mg NAA $\times L^{-1}$	79.48	73.50	86.07 a	72.06	71.80	71.25	62.99 ab	69.00	60.97
1000 mg ethephon $\times L^{-1}$	86.02	73.70	79.81 b	79.31	72.00	61.65	67.75 a	68.90	50.94
Mixture[1]	81.01	70.70	80.61 ab	71.65	68.50	67.60	60.44 ab	60.90	66.22

(b) Fruit flesh (%)

Treatment	Number of days after pollination							
	90			135		180		
	1994	1995	1996	1995	1996	1994	1995	1996
Control	82.72	85.54 ab	83.89 bc	86.00 c	86.87 c	87.64 d	87.23 b	86.62 bc
150 mg $GA_3 \times L^{-1}$	83.96	86.08 ab	83.37 c	88.67 ab	87.38 bc	88.49 c	87.79 b	85.89 c
100 mg NAA $\times L^{-1}$	84.00	86.19 a	84.92 a	89.53 a	89.36 a	90.18 a	89.17 a	89.67 a
1000 mg ethephon $\times L^{-1}$	82.66	85.14 b	83.71 bc	87.46 bc	88.01 abc	88.23 cd	87.49 b	86.95 bc
Mixture[1]	83.81	86.05 ab	84.55 ab	89.39 a	84.13 ab	89.40 b	88.28 ab	88.67 ab

[1] Mixture = (150 mg $GA_3 \times L^{-1}$) + (100 mg NAA $\times L^{-1}$) + (1000 mg ethephon $\times L^{-1}$).
Values are means of 5 replications (each replication represents two bunches).
Means within columns followed by a different letter are significantly different (P = 5%) according to the Duncan's multiple range test.

At the second and third stages of fruit development (90 and 135 d after pollination) and during the three successive growing seasons (1994–1996), spraying growth regulators, separately or in a mixture, on Barhee date palm clusters did not show any significant differences in the fruit setting percentage as compared with the control.

Throughout the three successive seasons, the fruit setting percentage of Barhee date palm trees tended to be high in the first stage of development, then progressively decreased with fruit age. The fruit setting percentage also varied from year to year.

The results agree with those of Elfving and Cline [3, 4] who reported that the application of ethephon and NAA had no effect on the apple tree fruit setting.

3.2. Effect of the growth regulators on the fruit flesh percentage

At the second stage of fruit development (90 d after pollination) during 1994, spraying GA_3, NAA, ethephon and the growth regulator mixture on flower clusters of Barhee date palm trees had no significant effect on the fruit flesh percentage as compared with the control.

At the same stage of development but during 1995, fruit flesh percentage significantly increased for NAA treatment relative to the ethephon treatment. At the same stage during 1996, application of NAA on flower clusters of Barhee date palm trees significantly increased the fruit flesh percentage as compared with the control.

At the third stage of fruit development (135 d after pollination) and during the second and third growing seasons, the fruit flesh percentage significantly increased for NAA or growth regulator mixture treatments, as compared with the control (*table Ib*). At the fourth stage of fruit development (180 d after pollination), during the three successive growing seasons, NAA significantly increased fruit flesh percentage, whereas at this same stage, during the first season, this percentage was significantly increased with the growth regulator mixture. The results concluded that, as compared with the control, the NAA treatment is most effective at increasing the fruit flesh percentage of Barhee date palm trees, then it is the treatment with the mixture which is most interesting. The results agree with those of Moustafa *et al.* [14] who reported that the NAA treatments increased the fruit flesh weight percentage of date palm trees.

The gibberellic acid treatment did not show a consistent effect on fruit flesh percentage; it increased the fruit flesh percentage in the third stage of development during 1995 and reduced it in the fourth stage during 1994, whereas application of ethephon to Barhee flower clusters did not show any significant effects on the fruit flesh percentage at all four stages of fruit development during the three successive growing seasons as compared to the control (*table Ib*). The first part of the results concerning the GA_3 effect agrees with those of Moustafa and Seif [11] who found that the GA_3 treatment increased fruit flesh percentage of date palm trees.

3.3. Effect of the growth regulators on the fruit dry matter percentage

During the first growing season (1994), the fruit dry matter percentage of Barhee date palm trees increased significantly in the second stage of fruit development (90 d after pollination) when trees were treated with ethephon relative to GA_3, NAA, or growth regulator mixture treatments (*table IIa*), whereas no significant effects appeared on the fruit dry matter percentage among various treatments as compared to the control.

As compared to the control (*table IIa*):

– the NAA treatment reduced the dry matter percentage of the date fruits at the second, third or fourth stages of the fruit development during the three growing seasons studied;

– the GA_3 treatment decreased the fruit dry matter percentage only in the fourth stage of fruit development during the second growing season;

– the growth regulator mixture treatment reduced the fruit dry matter percentage at the third and fourth stages of the fruit development during the second and third growing seasons.

Table II.
Effect of gibberellic acid (GA_3), naphthalene acetic acid (NAA), ethephon and a mixture of growth regulators on dry matter and total soluble solids of Barhee date palm tree fruits, at various times after pollination corresponding to different fruit development stages, during the growing seasons of 1994–1996.

(a) Fruit dry matter (%)

Treatment	Number of days after pollination							
	90			135		180		
	1994	1995	1996	1995	1996	1994	1995	1996
Control	14.21 ab	14.84	12.01 a	37.75 a	34.00 b	80.29 a	75.77 a	73.53 a
150 mg $GA_3 \times L^{-1}$	13.89 b	14.33	12.04 a	34.06 ab	32.16 bc	79.23 a	73.27 b	71.78 ab
100 mg NAA $\times L^{-1}$	13.79 b	14.13	11.79 b	31.30 b	28.32 bc	74.89 b	71.86 b	69.11 ab
1 000 mg ethephon $\times L^{-1}$	14.91 a	14.43	11.97 ab	34.71ab	43.91 a	79.27 a	75.27 a	72.76 ab
Mixture[1]	13.53 b	14.15	12.16 a	26.70 c	25.92 c	78.24 a	72.17 b	68.09 b

(b) Total soluble solids (°Brix)

Treatment	Number of days after pollination							
	90			135		180		
	1994	1995	1996	1995	1996	1994	1995	1996
Control	10.00 ab	12.87	10.60	42.63 a	39.53 ab	80.67 ab	79.53 a	71.80
150 mg $GA_3 \times L^{-1}$	9.83 b	12.60	10.67	41.40 a	30.83 bc	78.73 ab	76.72 abc	73.93
100 mg NAA $\times L^{-1}$	9.93 b	13.10	10.37	36.50 ab	28.60 bc	77.60 ab	75.20 bc	72.13
1 000 mg ethephon $\times L^{-1}$	10.53 a	13.00	10.70	41.86 a	45.90 a	80.87 a	78.26 ab	72.80
Mixture[1]	9.94 b	12.70	10.60	32.13 b	23.93 c	76.80 b	74.20 c	71.13

[1] Mixture = (150 mg $GA_3 \times L^{-1}$) + (100 mg NAA $\times L^{-1}$) + (1000 mg ethephon $\times L^{-1}$)
Values are means of 5 replications (each replication represents two bunches).
Means within columns followed by a different letter are significantly different (P = 5%) according to the Duncan's multiple range test.

3.4. Effect of the growth regulators on the fruit total soluble solids

As compared to the control, the GA_3 treatment had no significant effects on the fruit total soluble solids of the Barhee date palm fruits in all the four stages of the fruit development during the three successive growing seasons. Ethephon treatment significantly increased the Brix degree of Barhee fruits in the second or third stages of the fruit development during the first or third growing seasons, as compared with the GA_3, NAA or mixture treatments, respectively, but there were no differences for this characteristic between the treatments in the second stage of the fruit development during the second and third growing seasons as compared with the control (*table IIb*).

As compared to the control, the growth regulator mixture treatment significantly decreased the total soluble solids of Barhee fruits at the third fruit development stage during the second or third growing seasons; it equally decreased the date palm fruit Brix degree at the fourth stage of the fruit development during the second growing seasons. Treatments with the naphthalene acetic acid also significantly reduced the total soluble solids of Barhee fruits in the fourth stage of fruit development during the second growing season, as compared to the control (*table IIb*). The results concluded that the growth regulator mixture or NAA treatments reduced the fruit total soluble solids of Barhee fruit, whereas ethephon and gibberellic acid treatments had no significant effect on this characteristic. The results were

in agreement with those of Autio and Greene [5] who found that ethephon treatment had no significant effect on the fruit total soluble solids percentage.

3.5. Effect of the growth regulators on the fruit ripening percentage

The gibberellic acid or ethephon treatments had no significant effect on the fruit ripening percentage during the three successive growing seasons as compared to the control (*table III*). The fruit ripening percentage was significantly reduced with the application of NAA or growth regulator mixture on Barhee date palm flower clusters during the three successive growing seasons studied, as compared to the control. Similar effects with ethephon and GA_3 were obtained by Benjamin *et al.* [9], while other authors [5, 11, 13, 15] found that the fruit ripening percentage of date palm or apple trees increased with application of ethephon and decreased with application of GA_3.

3.6. Effect of the growth regulators on the fruit weight

As compared to the control, application of gibberellic acid or ethephon on date palm flower clusters (spadix) had no significant effect on the fruit weight during the three consecutive years. The results obtained with the ethephon and GA_3 applications on Barhee date palm trees are in agreement with those of other works [9, 15] in which the application of ethephon on date palm trees had no significant effect on the bunch weight and tree yield. Other authors [10, 11] found that the application of GA_3 increased the bunch weight of date palm trees. These different results could be assigned to the differences in cultivars, GA_3 concentrations and environmental conditions.

Treatments with naphthalene acetic acid or growth regulator mixture significantly increased the fruit weight per bunch during the first and third growing seasons, but had no significant effect during the second growing season, as compared to the control. These results obtained to the NAA treatment agree with those of Agusti *et al.* [1] who demonstrated that the application of another auxin (2,4-DP) on satsuma mandarins caused a slight increase in crop load. Moustafa *et al.* [14] found that the application of NAA on date palm trees reduced the fruit weight per bunch. This different result might be due to the environmental conditions and the differences of treatments and cultivar used.

Application of GA_3 slightly increased the yield of Barhee trees by (8.71, 7.6 and 20.46) kg per tree during the first, second and third growing seasons, respectively, as compared to the control. Ethephon treatment slightly reduced the yield by 1.9 kg

Table III.
Effect of gibberellic acid (GA_3), naphthalene acetic acid (NAA), ethephon and a mixture of growth regulators on production characteristics of Barhee date palm trees, during the years 1994–1996.

Treatment	Fruit ripening (%)			Fruit weight (kg / bunch)			Yield (kg / tree)		
	1994	1995	1996	1994	1995	1996	1994	1995	1996
Control	94.01 a	79.06 a	82.61 a	13.36 c	9.94	7.91 b	133.6 c	99.39	79.12 b
150 mg $GA_3 \times L^{-1}$	91.09 a	82.01 a	80.85 a	14.23 c	10.70	9.96 b	142.3 c	107.00	99.58 b
100 mg NAA $\times L^{-1}$	39.07 b	47.01 b	65.50 b	20.53 a	11.14	12.96 a	205.3 a	111.60	129.60 a
1000 mg ethephon $\times L^{-1}$	87.82 a	76.56 a	83.68 a	13.17c	10.65	8.42 b	131.7 c	106.50	84.24 b
Mixture[1]	47.26 b	30.57 c	64.77 b	17.50 b	12.05	14.30 a	175.0 b	120.50	143.00 a

[1] Mixture = (150 mg $GA_3 \times L^{-1}$) + (100 mg NAA $\times L^{-1}$) + (1 000 mg ethephon $\times L^{-1}$).
Values are means of 5 replications (each replication represents two bunches).
Means within columns followed by a different letter are significantly different (P = 5%) according to the Duncan's multiple range test.

per tree during the first growing season, but slightly increased the yield by (7.11 then 5.12) kg per tree during the second and third growing seasons, respectively (*table III*). In spite of these increments or reduction in tree yields for both GA_3 and ethephon, the differences observed were not significant as compared to non-treated Barhee date palm trees. The results of GA_3 treatments are similar to those obtained by other authors [11–13] who found that the GA_3 treatment slightly increased the average yield of date palm trees. The results of ethephon treatments also agree with those of researchers [2, 15] who found that the application of ethephon had no significant effect on yield of olive and date palm trees, respectively.

NAA or growth regulator mixture applications significantly increased the fruit weight per bunch during three successive growing seasons, although the increments during the second season were not significant as compared to the control. NAA treatments increased fruit yield of Barhee date palm trees by (71.7, 12.21 and 50.48) kg per tree during the first, second and third growing seasons, respectively, as compared to the control, but during the second season, the increase was not significant relative to the control (*table III*). Growth regulator mixture treatments increased the fruit yield of Barhee date palm trees by (41.4, 21.11 and 44.42) kg per tree and per year during the first, second and third seasons, respectively, but, in the second growing season, the yield increases were not significant as compared to the control.

The results of NAA treatments are in contrast to the results obtained by Moustafa *et al.* [14] who reported that these treatments reduced the average yield of date palm trees. These different results might be due to the differences in NAA concentrations and cultivars used and to environmental conditions under which the experiment was done. The results also showed that the yield of Barhee date palm trees were higher for all the treatments during the first growing season, then by the second and finally by the third growing seasons, except for the NAA and growth regulator mixture treatments which gave higher yield per tree during the third season then during the second growing season. The data suggest that, under the Al-Ain conditions of the United Arab Emirates, NAA may be more effective in increasing Barhee date palm trees' yields than other treatments.

4. Conclusions

The results concluded that the application of NAA or of a growth regulator mixture on flower clusters of Barhee date palm trees during the growing season, once 20 d after pollination, reduced the fruit dry matter percentage and ripening and increased the fruit flesh percentage and production per bunch and per tree. Therefore, these treatments could be recommended for the Al-Ain region in the United Arab Emirates.

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Efecto de algunos reguladores de crecimiento sobre ciertas características de producción del cultivar de palmera datilera Barhee (*Phoenix dactylifera* L.).

Resumen — **Introducción**. La palmera datilera es uno de los árboles frutales más cultivados en los estados del Golfo Arábigo. Se emplearon biorreguladores para mejorar la calidad de los dátiles y la productividad de la especie. En este contexto, se emprendió un estudio para evaluar la eficacia relativa del ácido giberélico (GA_3), el ácido naftaleno acético (ANA), el etefón y de una mezcla de estos reguladores de crecimiento en ciertas características del fruto y en la productividad de las datileras del cv. Barhee. **Material y métodos**. Se polinizaron cinco palmeras datileras Bahree homogéneas y femeninas del 5 al 15 de marzo de 1994, 1995 y 1996, colocando ocho brotes masculinos frescos en el centro de un escapo femenino (inflorescencia). Se emplearon diez inflorescencias en cada árbol repartidas en cinco lotes de dos inflorescencias. Cada lote fue sometido a uno de los siguientes tratamientos: testigo (agua), 150 mg $GA_3 \times L^{-1}$, 100 mg ANA $\times L^{-1}$, 1 000 mg etefón $\times L^{-1}$ y una mezcla de estos tres reguladores de crecimiento. Posteriormente, se evaluaron: tasa de fructificación, pulpa y materia seca del fruto, azúcares solubles totales, maduración del fruto y peso del fruto por racimo y árbol. **Resultados y discusión**. Los resultados mostraron que la aplicación de GA_3 o de etefón en inflorescencias de palmeras datileras Barhee no tenía efecto constante en las características del fruto y la productividad de los árboles. Los tratamientos de las inflorescencias de palmeras con ANA o con la mezcla de reguladores de crecimiento provocaron una reducción de las tasas de materia seca del dátil y de la maduración del fruto y un fuerte incremento del peso del fruto por racimo y árbol. **Conclusión**. El tratamiento de las inflorescencias de palmeras datileras Barhee, 20 d después de la polinización, con ANA o con una mezcla específica de reguladores de crecimiento disminuyó la tasa de materia seca, redujo la velocidad de maduración del fruto e incrementó el porcentaje de pulpa y el rendimiento de los árboles. Se podrían, por tanto, recomendar dichos tratamientos para mejorar la productividad de las palmeras datileras en esta región.

Estados del Golfo / *Phoenix dactylifera* / sustancias de crecimiento vegetal / pulverización / mejoramiento nutricional / rendimiento de cultivos