

MINERAL LEAF CONTENT OF SOME MALE AND FEMALE DATE PALMS *

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ABSTRACT

Ash and mineral (N, P, K, Ca and Mg) contents of the leaves of 12 male seedling date palms, as well as the female parent of these seedling males, were determined.

Leaf ash differed between males and it ranged between 4.66 to 19.15%. Ash percentage tended to be generally higher in the males as compared to females. Levels of mineral elements varied between male palms and they were generally higher in the males than in the leaves of female palms.

Key words: mineral content.

INTRODUCTION

Information regarding leaf mineral content of date palm is limited, especially comparative studies on the leaf mineral content of males and females are rare. Brown and Bahgat (1938) noted higher levels of ash and silicon in the leaves of the female as compared to male palm. Reuther (1948) in California, Shawky and Mougheith (1974) and Minessy *et al.* (1974), in Egypt, studied the mineral content of the leaves of different date palm cultivars.

The objective of this investigation is to

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study the leaf mineral contents of the selected females and their stellite males.

MATERIALS AND METHODS

This study was carried out at the College of Agriculture, King Saud University, Riyadh, during the 1984 season. One hundred date palm males selected from the Central region of Saudi were used. These males were similar in vigor and free of disease. Four leaves, about one year old, were detached from each tree. The leaves were collected in October, 1984. Similar leaf samples were also taken from the female palms grown in the same orchard.

Each leaf sample consisted of 10 pinnae, taken from the middle portion of the leaf, 5 pinnae from each side. The samples were washed thoroughly with distilled water, then were oven dried and ground for mineral determinations.

Ash and nitrogen were determined using the standard technique (A.O.A.C., 1970). Phosphorous was determined colorimetrically by the stannous chloride method (Toth *et al.*, 1948). Potassium was measured by the atomic absorption spectrophotometer. Calcium and magnesium were determined by the versenate method (Cheng and Bray, 1951).

The data were statistically analyzed and L.S.D. was calculated (Snedecor and Cochran, 1967).

RESULTS AND DISCUSSION

Ash Content

Date of this investigation revealed that ash content of the leaves of male palms (7.64%) was significantly higher than that of the leaves of female palms (6.25%) (Table 1). However, these results are not in line with Brown and Bahgat (1938). The data showed that the ash content of different males differed from one group to another. Ash content was significantly higher in the leaves of Nebut Seif than that in the leaves of other males except in the Serry male (Table 2). Also, ash content in the leaves of Serry was significantly higher than that in the leaves of Dakheini, Shakkret Al-Qassim, Khudari and Maktumi males. Differences in ash content in the rest of the males were not significant (Table 2).

Mineral Content

Nitrogen: Nitrogen content of the leaves of the males (1.04%) was significantly higher than that of the leaves of the females (0.97%) (Table 1). The nitrogen content differed from one group of males to another. Nitrogen content was significantly higher in the leaves of Barhi and Maktumi males than in the other males, except for Dakheini and Shakkret Al-Qassim. Furthermore, nitrogen content was significantly higher in the leaves of Nebut Seif, Dakheini, Shakkret Al-Qassim and Seleg as compared to Serry, Meneifi and Khashram males (Table 2).

Potassium: Results showed that the potassium level in the leaves of males (1.15%) was higher than that in the leaves of the females (1.05%). However, the difference was not statistically significant (Table

1). Regarding the potassium level in the leaves of different males, there were variations but they were not significant (Table 2).

Phosphorous: Leaf phosphorous content of the males (0.0421%) was significantly lower than that in the leaves of the females (0.0453%). Phosphorous content was significantly higher in the leaves of Meneifi males as compared to other males. Based on leaf phosphorous content, various males could be ranked in descending order as follows: Meneifi, Sefri, Nebut Seif, Maktumi, Seleg, Barhi, Serry, Sukkari, Khudari, Dakheini, Khashram and Shakkret Al-Qassim. The differences were statistically significant in most case (Table 2).

Calcium and Magnesium: Calcium and magnesium levels of the leaves of the different males were more or less the same (Table 2).

From data presented, it is evident that leaves from male palms contain relatively higher amounts of ash, N, K, Ca and Mg compared to females. On the contrary, P is relatively higher in female leaves than in male leaves.

Leaf N, P, Ca and Mg levels numbered in this study in both males and females were lower than that reported earlier (Reuther, 1948; Minessy *et al.*, 1974; Shawky and Mougheith, 1974). But the potassium level was higher than that reported by Shawky and Mougheith (1974), Minessy *et al.* (1976).

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Table 1. Ash and mineral contents of leaves of male and female palms on dry* weight basis

Sex	Ash %	Nitrogen %	Phosphorous %	Potassium %	Calcium %	Magnesium %
Male	7.64	1.04	0.0421	1.15	0.474	0.141
Female	6.25	0.97	0.0453	1.05	0.432	0.126
L.S.D. 5%	0.67 **	0.03 **	0.0023 **	-- N.S.	-- N.S.	-- N.S.

*Average of 12 cultivars.

Table 2. Mineral content of date palm cultivars on dry weight basis

Cultivar	Ash %	Nitrogen %	Phosphorous %	Potassium %	Calcium %	Magnesium %
Barhi	7.07	1.09	0.0440	0.87	0.473	0.131
Serry	8.13	0.94	0.0424	1.17	0.443	0.138
Nebut Seif	8.97	1.01	0.0473	1.17	0.464	0.125
Dakheini	5.65	1.02	0.0388	1.17	0.439	0.098
Sukkari	6.70	0.98	0.0404	0.81	0.526	0.140
Shakkret Al-Qassim	5.69	1.03	0.0326	1.03	0.414	0.125
Sefri	7.05	1.00	0.0478	1.18	0.405	0.138
Seleg	7.28	1.01	0.0444	1.14	0.518	0.143
Khudari	6.21	0.97	0.0396	1.20	0.440	0.156
Meneifi	6.90	0.90	0.0635	1.09	0.446	0.141
Khashram	7.29	0.90	0.0364	1.13	0.494	0.171
Maktumi	6.39	1.16	0.0473	1.20	0.375	0.099
L.S.D. 5%	1.65	0.08	0.0055	N.S.	N.S.	N.S.
C.V.	21.6	6.90	11.40	24.80	25.00	34.20

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المحتوى المعدنى للأوراق في بعض ذكور وإناث نخيل البلح

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الخلاصة

اشتمل هذا البحث على تقدير محتوى الأوراق لحوالى مائة من ذكور النخيل البذرية النامية في المنطقة الوسطى من الرماد والعناصر المعدنية (النيروجين ، الفوسفور ، البوتاسيوم ، الكالسيوم ، الماغنسيوم) . وأجريت هذه الدراسة كذلك على أوراق بعض الأصناف التي يحتمل أن تكون أمهات لهذه الذكور. توضح النتائج المتحصل عليها أن الرماد في أوراق الذكور يختلف من ذكر آخر إلى آخر، وقد تراوحت النسبة المثوية للرماد من ٤٦٦ - ١٩١٥٪ . كما وجد أن نسبة الرماد في أوراق الذكور كانت بصفة عامة أعلى منها في أوراق الإناث . كما وجد أن محتوى الأوراق من العناصر المعدنية يختلف من ذكر إلى آخر، كما كانت النسبة المثوية للعناصر المعدنية أعلى بصفة عامة في أوراق الذكور عنها في أوراق الإناث .

الكلمات الدليلية : المحتوى المعدنى .
