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V- SUMMARY AND CONCLUSION

The current study was imposed during the two successive seasons of 2015 and 2016 on Sewy and Samany date palm cultivars, cultivated in a private orchard located at Al Assiuty valley (sandy soil). This experiment aimed to study the effect of spraying algae extract, boron and silicon either alone or in combination between them on yield and some vegetative characteristics as well as some physical and chemical fruit properties. Thirty three mature palms of each date cultivar (15 years old) were selected in random, three date palms (3 replicates) were subjected to each treatment, 3 spathes of each replicate were chosen and subjected to determine the properties of fruits:-

The present work included eleven treatments as follow:

1. Control(water spray) . (**T_1**)
2. Spraying algae extract at 0.1%. (**T_2**)
3. Spraying algae extract at 0.3% .(**T_3**)
4. Spraying boron at 0.05%%. (**T_4**)
5. Spraying silicon at 0.1%. **(T_5)**
6. Spraying algae extract at 0.1% +silicon at 0.1%. **(T_6)**
7. Spraying algae extract at 0.3% +silicon at 0.1%. **(T_7)**
8. Spraying algae extract at 0.1% +boron at 0.05%. **(T_8)**
9. Spraying algae extract at 0.3% +boron at 0.05%. **(T_9)**
10. Spraying algae extract at 0.1% +silicon0.1% +boron0.05%. **(T_{10})**
11. Spraying algae extract at 0.3% +silicon 0.1%+boron0.05%. **(T_{11})**

The following measurements were evaluated:

1-Vegetative parameter

Number of new leaves/palm / growth cycle, number of spins, and leaf morphology (leaf length, number of leaflets/leaf, width of leaflet (cm) as well as length of leaflet. Leaflet area (cm^2) and leaf area (m^2).

2-Yield parameters:

Initial and horticultural fruit set %, bunch weight and total yield/palm.

3- Physical characteristics:

Average weight of flesh, seed and whole fruit (g), average of fruit length (cm), diameter and the fruit shape index.

4-Chemical characteristics:

Total soluble solids TSS%, reducing, non reducing and total sugars% and total titratable acidity % was determined as malic acid.

This experiment were set up in a randomized complete block design using L.S.D. test for recognizing the significance differences among the various treatment means using Statistix 8.1 software **(Analytical Software, 2005).**

The results of this experiment could be summarized as follow:

Vegetative parameter

1- Leaf length:

The leaf length increased by spraying algae extract, boron and silicon either alone or in combination between them on Sewy and Samany date palm cultivars during the two experimental seasons, comparing with control, this increase was significant in most cases. The maximum values of leaf length were obtained under T_{11} (algae extract 0.3% + boron at 0.05% +silicon at 0.1%) during 2015 and 2016seasons.

2- Leaflet length:

Spraying algae extract, boron and silicon either alone or in combination between them increased leaflet length comparing to the control during the two seasons on the two cultivars. The highest values of leaflet length were recorded under T_{11} (algae extract 0.3% + boron at 0.05% +silicon at 0.1%) followed by T_{10} (algae extract 0.1% + boron at 0.05% +silicon at 0.1%)

3- Leaflet width:

Data showed that, in most cases there were gradual and significant promotions in leaflet width of Sewy and Samany date palm cultivars during the two experimental seasons in response to spraying algae extract, boron and silicon either alone or in combination between them comparing to the control. Spraying algae extract 0.3% + boron at 0.05% +silicon at 0.1% (T_{11}) recorded the highest leaflet width values comparing to the other treatments during the two seasons.

4- Leaflet area:

There was a gradual promotion in leaflet area under spraying algae extract, boron and silicon either alone or in combination between them comparing to the control. Similar trend was found to be during the two seasons on the two cultivars. The treatment (algae extract 0.3% + boron at 0.05% +silicon at 0.1%) T_{11} gave the highest leaflet area values followed by (algae extract 0.1% + boron at 0.05% +silicon at 0.1%) T_{10}.

5- Number of leaflet:

Data showed that using algae extract boron and silicon either alone or in combined between them increased the average number of leaflets in compared with control, this increase was significant in most cases. The highest values were obtained under algae extract 0.3% + boron at 0.05% +silicon at 0.1% (T_{11}).

6- Leaf area:

Data showed a remarkable promotion in leaf area under spraying algae extract boron and silicon alone or in combined between the three materials, compared to unsprayed treatment of Sewy and Samany date palms. The maximum values of leaf area were obtained on sprayed palms with algae extract 0.3% + boron at 0.05% +silicon at 0.1% (T_{11}).

7- Number of spins:

The obtained data declared that using algae extract, boron and silicon each either alone or in the combination between them resulted in an increase in average number of spines compared with control during the two seasons on the two cultivars. It can be notice that the least values of average number of spines were observed under the control, while the highest number of spines was observed under algae extract 0.3% + boron at 0.05% +silicon at 0.1% (T_{11}).

8- Leaf content of N, P, and K:

Spraying Sewy and Samany date palm cultivars with algae extract , boron and silicon either alone or in combination between them increased leaf content of N, P and K % compared to control. Treatment T_{11}(algae extract 0.3% + boron at 0.05% +silicon at 0.1%) gave the highest values of N, P and K contents in the leaves and significantly increased such characteristics compared with the other investigated treatments in the two studied cultivars during the two investigated seasons.

9- Average number of new leaves/ season:

Data showed that the number of new leaves was affected by spraying with algae extract, boron and silicon either alone or in combination between them. T_{11} (algae extract 0.3% + boron at 0.05% +silicon at 0.1%) during summer growth cycle produced a highest number of new leaves compared with the other treatments during the other growth cycles.

Yield parameters:

1- Initial and horticulture fruit set %:

All treatments significantly increased initial and horticulture fruit set compared to the control for Sewy and Samany date palm cultivars. Spraying algae extract 0.3% + boron at 0.05% +silicon at 0.1% (T_{11}) gave the highest values of initial and horticulture fruit set during the two experimental seasons, compared to the other treatments including control.

2- Bunch weight and total yield:

The treatment of (algae extract 0.3% + boron at 0.05% +silicon at 0.1%) T_{11} gave the highest bunch weight and consequently total yield compared with the other experimental treatments including the control (water spray) which gave the lowest bunch weight and total yield.

Physical fruit character:

1- Fruit weight and its size:

Data showed that, fruit weight and its size were significant affected by spraying algae extract, boron and silicon either alone or in combination between them on Sewy and Samany date palms during the two seasons. T_{11} (algae extract 0.3% + boron at 0.05% +silicon at 0.1%) gave the highest fruit weight and its size, followed by algae extract 0.1% + boron at 0.05% +silicon at 0.1% (T_{10}) compared with the other treatments.

2- Flesh weight:

Data cleared that flesh weight took the same trend of the fruit weight with all investigated treatments, so using algae extract 0.3% + boron at 0.05% +silicon at 0.1% (T_{11}) gave the highest pulp weight, followed by algae extract 0.3% + boron at 0.05% +silicon at 0.1% (T_{10}).

3- Seed weight:

The result indicated that, no significant difference between the treatments during the two experimental seasons on the two cultivars.

5- Fruit length and its diameter

Data showed that, fruit diameter took the same trend of fruit length during the two seasons on the two cultivars, most of treatments significantly increased fruit length and its diameter compared with control. Also data showed that algae extract 0.3% + boron at 0.05% +silicon at 0.1% (T_{11}) gave the highest fruit length and its diameter.

7- Shape index:

Data showed that all experimental treatments failed on record a significant difference compared with control during the two seasons on the two cultivars. Concerning to Sewy date cultivar, T_1 (control) and T_2 (algae extract at 0.1%) gave the highest fruit shape index during the first season, while T_5 (silicon at 0.1%) during the second season. For Samany cultivar T_6 (algae extract 0.1% + boron 0.05%) gave the highest values of fruit shape index during the two seasons.

Chemical fruit characters:

1- TSS:

The obtained data showed that the total soluble solids of Sewy and Samany date palm cultivars, was remarkably enhanced when the palms were sprayed with algae extract, boron and silicon either alone or in combination compared with control. The highest values of TSS were obtained under algae extract 0.3% + boron at 0.05% +silicon at 0.1% (T_{11}) on the two cultivars during the two seasons.

2- Acidity%:

According to obtained data, spraying algae extract, boron and silicon either alone or combined between them decreased the total acidity, compared to the control on Sewy and Samany cultivars during the two seasons. T_{11} (algae extract 0.3% + boron at 0.05% +silicon at 0.1%) gave the lowest acidity% on the two cultivars during the two seasons. It is also clear to notice that the values of acidity during the second season were favorable than those of the first season on Sewy and Samany date palm cultivars.

3-TSS/ acid ratio

Data showed that, all the treatments significantly increased TSS/ acid ratio compared with control which gave the lowest values. Treatment T_{11} (algae extract 0.3% + boron +silicon) gave the highest values.

4- Reducing and total sugars%:

Data showed that reducing and total sugars took similar tendency of total soluble solids. Reducing and total sugars increased by spraying algae extract, boron and silicon either alone or in combination between them as compared with control on Sewy and Samany date palm cultivars during 2015 and 2016 seasons. T_{11} (algae extract 0.3% + boron at 0.05% +silicon at 0.1%) gave the highest values of reducing and total sugars% and significantly increased it compared to the other treatments during the two seasons.

5- Non-reducing sugar%:

The obtained results of non-reducing sugar content showed that there is significant difference among treatments during the second season only on Sewy cv. while on Samany date palm there is no significant difference between treatments during the two experimental seasons of 2015 and 2016. T_{11} (algae extract 0.3% + boron at 0.05% +silicon at 0.1%) gave the highest non- reducing sugar percentage for Sewy date palm, while silicon 0.1% (T_5) gave the highest values during the first season and boron 0.05% (T_4) during the second season for Samany date palm.

Conclusion

Results under the condition of this study could lead to the following recommendation:

1- It is important to use spray with algae extract, boron and silicon either alone or in combination between them on trees especially which grown in reclaimed sandy soil that resulted in improve physiological performance of palms which reflect on their yield and fruit quality.

2- The treatment of spraying (algae extract 0.3%+ silicon at 0.1% + boron at 0.05%) T_{11} was favorable for Sewy and Samany date palm cultivars grown in sandy soil to produce the highest vegetative growth parameters and obtained an economical yield with good fruit quality.