**Paper title**

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**Abstract**

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**Introduction**

Grapevine (*Vitis vinifera* L.) is considered one of the most important fruit crops in the world in terms of cultivation and economic value. It is used for production of fresh fruit, dried fruit, wine and juice (3 and 19). Cultivation of grapevine is believed to be originated in Armenia near the Caspian Sea then moved to Europe and Asia (1, 3, and 7). Grape is one of the most delicious and nourishing sub-tropical fruit with the ability for adaptation under temperate, subtropical and tropical conditions. The berries contain adequate minerals, Ascorbic acid and vitamin (B1and B2) (14). According to the Food and Agriculture Organization (FAO) (7), good commercial yields were 15 to 20 Kg grapes per vine or 15 to 30 (or more) tons/ha (80 to 85% moisture). It is possible to increase yield and improve quality parameters of grape by using some canopy practices like girdling, topping, tipping, removal of lateral shoots, remove the leaves and follow the correct fertilization program (2 and 4).

Table grapes, with excellent commercial properties (3)

It was referred, by Ak *et al*. (4) in their experiment on the peaches rootstock Garnem that using the apical shoots and nodes of this plant and growing them on MS medium

This study was aimed to evaluate the effect of girdling and foliar spraying of phosphorus on vegetative growth, yield and quality of two grapevine cultivars (*Vitis vinifera* L*.*) (4).

**Material and Methods**

This study was carried out in the vineyard of the college of Agricultural engineering sciences, University of Duhok, Kurdistan /Iraq, in order to study the effect of girdling and three level of spraying with phosphorus (0, 5 or 10 g.L-1) on two grapevine cultivars (Zark and Kamali).

using a graduated cylinder contained water to determine the berries volume, and berries total contents of sugar (%): Taking 1ml from pure juice, add 1ml of phenol 5% then 18ml of distilled water and then 5ml of H2SO4 30 min in boiling water at 60 ∘C The standard sugar solution and standard curve were prepared (Lane and Eynon method) (10). and total soluble solids (%): The total soluble solids measured witfruits

**Results and Discussion**

Shoot length (cm)

Results in table (1) showed that Zark cultivar had a significant effect on shoot length (225.78cm). The same table clearly shows that girdling process and spraying cultivars with10 g.L-1 of phosphorus significantly affected shoot length where the highest values were 242.89 and 272.75 cm, respectively. The interaction of Zark cultivar + girdling and Kamali cultivar + girdling significantly differed in shoot length from either cultivar+Non-girdling. Kamali cultivar treated with 10g.L-1 Phosphorus gave the highest value which surpassed significantly to the lowest value (Table1). The combination of girdling/Phosphorus also showed significant effect on shoot length of grapevine, since the maximum value was obtained from combination treatment of girdling/10g.L-1 Phosphorus. Results also showed that the interactions of the three factors differed significantly; the maximum shoot length value (308.33 cm) was recorded from interaction of Kamali cultivar/ girdling/10 g.L-1 Phosphorus compared with the minimum value (150 cm) resulted from Kamali cultivar/ Non-girdling/0 g.L-1 Phosphorus.

**Table 1. Effect of girdling and foliar spraying of phosphorus on shoot length (cm) of two grapevine (Vitis vinifera L.) cultivars, Zark and Kamali**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Cultivars | Girdling | Phosphorus 0 | phosphorus 5 g.L-1 | phosphorus 10 g.L-1 | Cultivar\* Girdling | Cultivar |
| Zark | Non-girdling |  |  |  |  |  |
| Girdling |  |  |  |  |
| Kamali | Non-girdling |  |  |  |  |  |
| Girdling |  |  |  |  |
| Phosphorus | |  |  |  |  | |
| Cultivar  \*Phosphorus | Zark |  |  |  |  |  |
| Kamali |  |  |  |  |  |
| Girdling  \* phosphorus | Non-girdling |  |  |  |  |  |
| Girdling |  |  |  |  |  |

Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan multiple ranges test at significant level of 5%.

**Conclusion**

According to obtained results the girdling lead to improve all studied parameters compared with non-girdle one. Girdling of Zark cultivar have a significant effect on number of clusters, shoot length, number of leaves per shoots, number of berries per clusters, Total sugar in berries and TSS in berries. Also, the girdling of Kamali cultivar led to enhancement in number of clusters, shoot length, number of shoots per vine, number of leaves per shoots and size of berries. Spraying of phosphorus especially at 10g.L-1 had a significant effect on all studied parameters compared with control.

The interaction of phosphorus spraying mainly at 10g.L-1 with both cultivars significantly increased all the studies parameters except the number of shoots per vine, where 5g.L-1 was the best treatment compared to the control. Also, the interaction of girdling with 10g.L-1 phosphorus spraying had a significant difference in enhancing all studied parameters compared with the control.

The combination of girdling and 10 g.L-1 with either cultivar was superior treatment with most of parameters compared to the control of both cultivars.

**References**

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