

EFFECT OF TYPE AND DATES OF CANES TAKING IN ROOTING AND GROWTH OF GRAPEVINE (*Vitis vinifera* L.) cv. TAIFI

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ABSTRACT:

This study was carried out during growing season 2011-2012 on 17 years old Taifi in a private vineyard located near Zawita town, Duhok governorate, Kurdistan region, Iraq, in order to study the effect of type and dates of taking the cutting on rooting and growth of grape transplants, two types of cuttings (basal and middle cutting) were taken at three dates, first at late autumn (November D1), second at winter (February, D2) and the third at late winter (March, D3), the basal cutting were taken with a part of wood. Results indicated that the basal cutting overtopped in shoot length, No. shoots and leaves per plant, root dry weight and rooting percentage, while never shows its influence on the content of chlorophyll. Whereas first date of taking cutting significantly increased all parameters mentioned above. Interaction of basal cutting + first time of taking had the best significantly values.

KEY WORD: type, Date, Cutting, Grapevine, Taifi.

1. INTRODUCTION

Grapes are very easy to rooting from cuttings. With proper care, a dormant cutting can be started in the spring and by fall will give a vine large enough to bear a cluster or two of fruit the next season. The important factors are proper care and preparation of the cuttings.

Grapes can be propagation from two types of cuttings, dormant or hardwood, and green cuttings. Dormant cuttings are easiest to handle, but green cuttings work in situations when it isn't possible to use hardwood, such as for grapes that don't root easily from dormant cuttings, or when green cuttings are all that are available (Rombough, 2014)

Dormant cuttings can be taken any time after the vine has fall its leaves until the buds begin to swell in the spring. Cuttings are made from the new shoots (canes) that grew during the growing season that just ended. The best wood is the first one to two feet of the base of the shoot where the buds are closest together, but any healthy, well matured section of the cane will suffice. Ideal thickness is pencil diameter up to about $\frac{3}{4}$ inch thick. Thicker cuttings can be hard to handle and thinner wood may not be mature, though thinner wood may be acceptable if the variety has naturally small shoots. Avoid wood that is soft and spongy and has large pith. Best wood is dense and light green inside with relatively small pith (Strik, 2011; Alsaidi 2014).

Castro, *et al.*, (1994) found that the rooting of both basal and middle shoots of Muscadine grape (*Vitis rotundifolia* Michx.) is better than

the rooting of terminal sections of the shoots. The growth of leaves in both basal and middle cuttings was superior in the treatment with low temperature. Robbins *et al.*, (1984) suggested that cuttings collected in the winter or early spring (March, April) gave best rooting percentage and have the best vegetative growth characteristics.

So we decided to study the type of cutting, date of taking the cuttings and their interaction on rooting percentage and vegetative growth characteristics of grapevine transplants cv. Taifi.

2. MATERIAL AND METODS

Cuttings of grapevines (*Vitis vinifera* L. cv. Taifi) were taken from different parts of plants grown in a private vineyard located near Zawita town. Two types of cuttings (basal and middle cutting) were taken at three dates, (1) at late autumn (November, D1), (2) at winter (February, D2), and (3) at late winter (March, D3), the basal cuttings were taken with a part of old wood and its diameter was of 5 ± 1 (for cutting) and 8 ± 1 (for old wood), while middle cuttings had 3 ± 1 mm. So, the experiment involved six various treatments.

Cuttings of first and second date were placed horizontally in a humidified soil throughout the winter season and brought to nursery to planting, whereas the cuttings of third date were directly planted in the nursery. All cuttings were planted at the same time. A completely randomized block design was followed in the experiment arrangement. Every treatment consisted of ten cuttings per each replicate with three

replications, so the numbers of units used were 18 experimental units.

All results were analyzed statistically by using SAS program (2003). Duncan's multiple tests at 5% level of portability was to compare the treatment according to Al- Rawi and Khalafalla (2000).

3. RESULTS AND DISCUSSION

1- Rooting percentage:

Data in table (6) clarified that there was no significant difference between basal and middle

cutting, whereas the first and second date significantly dominated the third date since the first date appeared to have the highest rooting percentage (95%) but there was no significant difference between first and second date. For the interaction between type of cutting and date of taking, same table explain that the highest rooting percentage (96.67 %) was with the interaction of basal cutting + first date compared to the lowest rooting percentage (73.33 %) with the interaction of middle cutting + third date only.

Table (1): Effect of cutting types, dates of taking and their interaction on chlorophyll content (SPAD) of transplant leaves of grapevine cv. Taifi.

| Type of cutting | Dates | | | Mean effect of type of cutting |
|----------------------|---------|---------|---------|--------------------------------|
| | D1 | D2 | D3 | |
| Middle | 93.33 a | 93.33 a | 73.33 b | 86.67 a |
| Basal | 96.67 a | 93.33 a | 90.00 a | 93.33 a |
| Mean effect of dates | 95.00 a | 93.33 a | 81.67 b | |

Means with the same letter are not significantly different according to Duncan multiple ranges test at 5% level.

2- Shoot length (cm):

Table (2) indicates that the highest shoot length (36.78 cm.) resulted from basal cutting and significantly overtopped middle cutting which recorded lowest shoot length (27.22 cm). The date also had a significant effect on the shoot length, since the first date significantly increased shoot length compared to the third date, while there were no significant differences between first and second or between second and third date.

For the interaction between type of cutting and date of taken the cutting, it is clear from table (2) that the highest shoot length (39.25 cm) was with the interaction between basal cutting and first date, whereas the lowest length (24.92 cm) was with the interaction between middle cutting and third date.

Table (2): Effect of type of cutting, dates of taking and their interaction on shoot length of transplant of grapevine cv. Taifi.

| Type of cutting | Dates | | | Mean effect of type of cutting |
|----------------------|----------|----------|----------|--------------------------------|
| | D1 | D2 | D3 | |
| Middle | 30.67 bc | 26.08 cd | 24.92 d | 27.22 b |
| Basal | 39.25 a | 36.75 a | 34.33 ab | 36.78 a |
| Mean effect of dates | 34.96 a | 31.42 ab | 29.63 b | |

Means with the same letter are not significantly different according to Duncan multiple ranges test at 5% level.

3- No. shoots per transplant:

Data presented in table (3) shows that the highest numbers of shoots (2.01 and 2.17) were obtained from basal cutting and first date respectively; also there was significant differences between second and third dates. Concerning the interaction between type of cutting and dates, same table indicates that the interaction of basal cutting + first date gave the maximum numbers of shoots (2.47) which was significantly supported all the interactions except the interaction between basal and second date.

Table (3): Effect of type of cutting, dates of taking and their interaction on No. of shoots per transplant of grapevine cv. Taifi.

| Type of cutting | Dates | | | Mean effect of type of cutting |
|----------------------|---------|---------|---------|--------------------------------|
| | D1 | D2 | D3 | |
| Middle | 1.87 bc | 1.43 cd | 1.23 d | 1.51 b |
| Basal | 2.47 a | 2.20 ab | 1.37 cd | 2.01 a |
| Mean effect of dates | 2.17 a | 1.82 b | 1.30 c | |

Means with the same letter are not significantly different according to Duncan multiple ranges test at 5% level.

4- No. leaves per transplant:

Data presented in table (4) shows that the type of cutting had significant effect on number of leaves per plant, maximum number of leaves was resulted from basal cutting; also dates of taking cutting had significant differences, since cutting taken in first date significantly overtopped other dates.

Concerning the interaction between type of cutting and date of taking cutting, same table refers that the highest number of leaves (27.57) were caused by the interaction of basal cutting + first date compared to all other interaction treatment.

Table (4): Effect of type of cutting, dates of taking and their interaction on No. of leaves per transplant of grapevine cv. Taifi.

| Type of cutting | dates | | | Mean effect of type of cutting |
|----------------------|---------|----------|----------|--------------------------------|
| | D1 | D2 | D3 | |
| Middle | 21.43 b | 17.07 bc | 14.73 c | 17.74 b |
| Basal | 27.57 a | 19.50 bc | 16.33 bc | 21.13 a |
| Mean effect of dates | 24.50 a | 18.28 b | 15.53 b | |

Means with the same letter are not significantly different according to Duncan multiple ranges test at 5% level.

5- Root dry weight (g):

It's clear from (5) that basal cutting significantly superior middle cutting concerning to root dry weight, same table also explains that cutting taken in the first date had the maximum root dry weight (16.30 g) which was significantly overtopped the other dates. The interaction of basal cutting + first date had the maximum root dry weight (18.26 g) compared to the minimum root dry weight (10.88 g) with the interaction of middle cutting + third date.

Table (5): Effect of type of cutting, dates of taking and their interaction on root dry weight (g) of transplant of grapevine cv. Taifi.

| Type of cutting | Dates | | | Mean effect of type of cutting |
|----------------------|----------|----------|----------|--------------------------------|
| | D1 | D2 | D3 | |
| Middle | 14.34 bc | 11.09 c | 10.88 c | 12.10 b |
| Basal | 18.26 a | 15.78 ab | 15.48 ab | 16.50 a |
| Mean effect of dates | 16.30 a | 13.43 b | 13.18 b | |

Means with the same letter are not significantly different according to Duncan multiple ranges test at 5% level.

6- 1- Chlorophyll content (SPAD):

It's clear from table (1) that types of cutting had no significant effect on chlorophyll content in leaves. Chlorophyll content appears to be significantly affected by dates of taking the cutting, cutting taken in first date significantly superior other dates, whereas there were no significant differences between second and third date. Best value of leaves chlorophyll (47.14) was resulted from the interaction of first date + Basal compare to the lowest value (39.26 SPAD) from the interaction of middle + second date.

Table (1): Effect of type of cutting, dates of taking and their interaction on chlorophyll content (SPAD) of transplant leaves of grapevine cv. Taifi.

| Type of cutting | Dates | | | Mean effect of type of cutting |
|----------------------|---------|---------|---------|--------------------------------|
| | D1 | D2 | D3 | |
| Middle | 45.09 a | 39.26 b | 45.11 a | 43.15 a |
| Basal | 47.14 a | 45.17 a | 41.07 b | 44.46 a |
| Mean effect of dates | 46.12 a | 42.21 b | 43.09 b | |

Means with the same letter are not significantly different according to Duncan multiple ranges test at 5% level.

It's clear from table (1 - 6) that the basal cutting overtopped the middle cutting in all most studied parameters, the reason might be attributed to that the basal cutting more mature and thicker than middle cutting and also basal cutting taken with part of the old wood so they allocated more space for the roots formation, being thicker and more mature than the middle cutting would help her quickly forming callus and forming bigger and stronger root system which reflected positively on the formation of vegetative growth with more branches and more number of leaves contain and the highest chlorophyll content more chlorophyll (Abu-Qaoud, 1999; Barickman, 2003; Dennis *et al.*, 2004).

Concerning the date of taking the cutting same tables clearly indicated that the cutting taken in the first date overtopped other date in most of the characteristics undertaken in this study followed by the second date and in the last the third date, the reason may be due to that cutting taken in the late autumn-early winter and stored in a humidified soil throughout the winter season had more chance to formation callus than the other dates, since the formation of callus is necessary to formation and development of root system.

Conclusions

According to the results of this study, we can express the following conclusion, basal cutting was more effective on improving shoot length, number of shoot and number of leaves per transplant and root dry weight, whereas there are no effect of type of cutting on chlorophyll content and rooting percentage. First date of taking the cutting significantly improved all the traits under taken in this study followed by the second date.

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کارگهري جور و کاتي کومکرنا قهلهما لسهر زيده کرنا ميويين تري (*Vitis Vinifera L.*) چوري تايفي

کورتي:

ئهف فه کولينه هاته ئه نجامدن ل دورين سالا جانندن 2011-2012 لسهر ميويين تري ژبي 17 سالي ل رهزه کي تايهت ل نيزيکي باژيري زاويته ب مهره ما ديار کرنا کاري چور و کاتي کومکرنا قهلهما لسهر هيتر وشينکاتيا نه مامکيت ميويين تري، دوو چورين پهلهما (قهله مين بنچينه بي و ناوهر است) هاتنه وهر کرتن د سي کاتادان، بي نيکي ل ديمه يکا بازي ول سهري زفستاني بي دووي ل زفستاني وي سي ل ديمه يکا زفستاني ول سهري بهاري، قهله مين بنچينه بي هاتنه وهر کرتن دکهل بارچه کا داري. ئه نجاما ديار کر کو قهله مين بنچينه بي بوونه ئه گهرا زيده بونا دريژيا نه مامکا و ژمارا تاکا و رهووکا لسهر نه مامکي و کيشانا رههين هسک وريژه ي سهدي يا ره هداي، بهلي چي کارگهري لسهر که سکا تي نه بو، لکاتي کديدا کاتي نيکي بي وهر کرتنا قهلهما بو ئه کهري زيده بونا نهو که سي تي هاتينه ديار کر ل سهري. کارليک کردن دناؤ قهله مين بنچينه بي و کاتي نيکي بي وهر کرتنا قهلهما بو ئه کهري زيده بونا نهو که سي تي هاتينه وهر کرتن ل في فه کولينی.

تاثير نوع وموعد جمع الاقلام على تجذير ونمو عقل العنب (*Vitis vinifera L.*) صنف طائفی

الخلاصة:

اجريت هذه الدراسة خلال الموسم الزراعي 2011-2012 على تجذير عقل كرمات عنب بعمر 17 سنة مزروعة في مزرعة اهلية تقع قرب مدينة زاوية، محافظة دهوك، اقليم كردستان العراق بهدف دراسة تأثير نوع وموعد جمع العقل على قوة ونمو شتلات العنب، اخذت نوعين من العقل (عقل قاعدية ووسطية) في ثلاث مواعيد هي الاول في نهاية الخريف (كانون الاول) والثاني خلال الشتاء (شباط) والثالث في نهاية الشتاء وبداية الربيع (اذار)، العقل القاعدية اخذت مع جزء من الخشب. بينت النتائج بان العقل القاعدية تفوقت في صفات طول الشتلة وعدد الفروع والاوراق على النبات والوزن الجاف للجذور ونسبة العقل المجذرة، بينما لم يظهر لها تأثير على محتوى الكلوروفيل. في حين الموعد الاول لاخذ العقل سبب زيادة معنوية في جميع الصفات المذكورة اعلاه. التداخل بين العقل القاعدية والموعد الاول اعطى افضل القيم المعنوية لجميع الصفات المدروسة.