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# EFFECT OF SPRAYING EXTRACTS OF ROCKET AND FENUGREEK SEED SPROUTS ON YIELD AND QUALITY OF FLAME SEEDLESS GRAPEVINES

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**ABSTRACT:** This study was carried out during 2015 and 2016 seasons at Samalout district, Minia Governorate to study the effect of spraying extracts of rocket and fenugreek seed sprouts each at 0.5 to 2% on growth aspects, vine nutritional status, berry setting (%), yield, berries colouration (%) and berries quality of Flame seedless grapevines. Treating the vines three times with rocket or fenugreek seed sprouts extracts each at 0.5 to 2% resulted in an obvious promotion on all growth aspects, leaf pigments and nutrients, berry setting (%), yield, berries colouration (%) and berries quality relative to the control treatment. The promotion was related to the increase in the concentration of rocket and fenugreek seed sprouts extracts. The investigated parameters were unaffected with increasing concentration from 1.0 to 2.0 (%) from each material. Fenugreek seed sprouts was superior than using rocket seed sprout in this respect. Carrying out four sprays of extract of fenugreek seed sprouts at 1.0% was responsible for improving yield and berries quality of Flame seedless grapevines.

**Key words:** Extracts of rocket and fenugreek seed sprouts; berries colouration (%), yield, berries quality, Flame seedless grapevines.

## INTRODUCTION

Flame seedless grapevines cv grown under middle Egypt conditions suffers from irregular berries colouration which reflected in collapsing marketing of the fruit to local and foreign markets. Promoting berries colouration by using different chemicals causes the accumulation of harmful residual substances in the berries and reduces exportation process. It is necessary for avoiding the use of chemicals by application of extracts of crop seed sprouts which are promising in the long run of grapevines. Sprouting or germination of crop seeds may change the chemical composition of organic foods and enhance the biosynthesis of essential amino acids like glutamic acid, tryptophan and arginine, vitamins B and C and all essential macro and micronutrients and makes them high and very available to the plants (Cazoula *et al*., 2004; Cairney, 2005; Blommerson, 2007). Crop seed sprouts are responsible for supplying the plants with their requirements from most organic foods like carbohydrates, proteins, fats, amino acids, vitamins, antioxidants and nutrients (Camacho *et al*., 1992; Cairney, 1995; Abdallah *et al*., 2000; Crews and Peoples, 2004).

Treating different species of fruit crops and other horticultural plants with crop seed sprouts extracts was accompanied with improving growth, plant nutritional status, fruit setting (%), yield and fruit quality (Abdallah, 2008; Darwish, 2009; Anderson and Cedergreen, 2010; Al-Shereif *et al*., 2013; El-Sayed, 2014; El-Khawaga and Mansour, 2014; Ahmed and Habasy, 2014; Mohamed, 2014; Refaai, 2014a and b; Abd El-Rahman, 2015).

The objective of this study was to evaluate the effect of application of spraying two crop seed sprout extracts namely fenugreek and rocket seed sprouts on growth, yield and berries quality of Flame seedless grapevines.

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## MATERIALS AND METHODS

This study was carried out during two successive seasons of 2015 and 2016 on forty-four-year-old uniform in vigour Flame seedless grapevines grown on own roots in a private vineyard located at Samalout district, Minia Governorate, Egypt where the soil texture is clay and well drained and water table is not less than two meters deep. Vines are spaced at 2 meters between vine × 3 meters between rows (700 vines per faddan). The selected vines (42 vines) were chosen as uniform in vigour as possible and devoted to achieve this study. The chosen vines were pruned during the first week of January in both seasons. Spur pruning system using cordon trellis supporting system was followed. Vine bud load for all the selected vines was adjusted to 72 eyes (on the basis of 20 fruiting spurs x three eyes plus six replacement spurs x two eyes). Surface irrigation system was followed using Nile water (EC was 150 ppm).

This study contained seven treatments the following spraying were applied on the vine:

1. Control treatment (sprayed with water only).
2. Extract of rocket seed sprout at 0.5%.
3. Extract of rocket seed sprout at 1.0 %.
4. Extract of rocket seed sprout at 2.0 %.
5. Extract of fenugreek seed sprout at 0. 5%.
6. Extract of fenugreek seed sprout at 1.0 %.
7. Extract of fenugreek seed sprout at 2.0 %.

Each treatment was replicated three times, two vines/each. Rocket seeds were sown at a rate of 30 g seeds/$m^2$, then they harvested at fully expanded green cotyledonny leaves stage (after eleven days from sowing). Fenugreek seeds were sown in dark place using glass jar method (Abdallah, 2008), then sprouts were harvested after three days from seed soaking. Sprouts of rocket and fenugreek were kept under $4^oC$ in refrigerator till use. For application, sprouts of rocket and fenugreek seeds were homogenized with distilled water according to concentrations using an electric blender for five minutes, then filterated. The two crop seed sprouts were sprayed four times and two week intervals during both seasons at growth start ($1^{st}$ of Mar.), $3^{rd}$ week of March, $1^{st}$ week of April and $3^{rd}$ week of April. Triton B as a wetting agent was added at 0.05%. The foliar spray was done till runoff. Randomized complete block design (RCBD) was followed.

During both seasons, the following measurements were recorded:

1. Vegetative growth characteristics namely main shoot length (cm), number of leaves/ shoot, leaf area $(cm)^2$ according to (Ahmed and Morsy, 1999), wood ripening coefficient (Bouard, 1966), cane thickness (cm) and pruning wood weight/ vine (kg).
2. Chlorophylls a and b and total carotenoids (mg/ g FW) according to Hiscox and Isralstam (1979).
3. Percentages of N, P, K and Mg in the petioles (on dry weight basis) according to (Summer, 1985; Wilde *et al.* 1985).
4. Percentage of berry setting, yield expressed in weight (kg.) and number of clusters per vine.
5. Weight (g.) and dimensions (length and width, in cm) of cluster.
6. Percentages of berries colouration.
7. Physical and chemical characteristics of the berries namely weight (g.) and dimensions (longitudinal and equatorial cm), TSS, total sugars (Lane and Eynon, 1966), total acidity (%, as g tartaric acid/100 ml juice) according to (AOAC, 2000) and total anthocyanins in the berries (mg/100g F.W) according to (Fulcki and Francis, 1968).

Statistical analysis was done and treatment means were compared using new LSD at 5% (according to Mead *et al*., 1993 ; Rao, 2007).

## RESULTS

### Vegetative Growth Parameters

It is clear from results in Table 3 that the tested treatments increased significantly growth parameters namely main shoot length, number of leaves/shoot, leaf area, wood ripening coefficient, cane thickness and pruning wood weight in the two seasons compared to the control treatment. The promotion was related to the increase in concentrations of both materials. Significant differences on these growth parameters were observed among most concentrations except among the higher two

**Table 1. Analysis of the tested soil**

| Constituent | Value |
|---|---|
| **Particle size** | |
| **Sand (%)** | 7.1 |
| **Silt (%)** | 20.0 |
| **Clay (%)** | 72.9 |
| **Texture** | Clay |
| **pH (1:2.5 extract)** | 7.95 |
| **EC (1 :2.5 extract) ($dsm^{-1}$) 1 cm/25°C.** | 0.96 |
| **OM (%)** | 2.92 |
| **$CaCO_3$ (%)** | 1.91 |
| **Total N (%)** | 0.15 |
| **Available P (Olsen, ppm)** | 4.9 |
| **Available K (ammonium acetate, ppm)** | 500 |

**Table 2. Chemical analyses for fenugreek and rocket seed sprouts**

| Fenugreek (mg/100g FW) | | Rocket (mg/100g FW) | |
|---|---|---|---|
| **Constituent** | **Value** | **Constituent** | **Value** |
| **Asparatic acid** | 2.2 | **Cystine** | 4.1 |
| **Arginine** | 2.1 | **Cysteine** | 3.9 |
| **Alanine** | 2.9 | **Methionene** | 3.8 |
| **Isoleucin** | 2.1 | **Glutamic acid** | 3.5 |
| **Cystine** | 1.9 | **Thiamine** | 0.16 |
| **Cysteine** | 1.8 | **Riboflavin** | 0.15 |
| **Glutamic acid** | 2.0 | **Vitamin E** | 0.94 |
| **Methionene** | 6.0 | **Vitamin A** | 4.4 |
| **Lysine** | 5.1 | **Vitamin C** | 101 |
| **Vitamin A** | 1.0 | **K** | 496 |
| **Vitamin B1** | 0.32 | **P** | 1410 |
| **Vitamin B2** | 0.30 | **Mg** | 460 |
| **Vitamin B6** | 1.00 | **Fe** | 267 |
| **Vitamin C** | 2.00 | **Mn** | 16 |
| **Ca** | 220 | **Zn** | 255 |
| **P** | 341 | | |
| **K** | 469 | | |
| **Mg** | 371 | | |
| **Fe** | 242 | | |
| **Phytic acid** | 0.9 | | |
| **Niacin** | 1.4 | | |

**Table 3. Effect of rocket and fenugreek seed sprout extracts foliar spray on some vegetative growth parameters of Flame seedless grapevines during 2015 and 2016 seasons**

| Treatment | Main shoot length (cm) | | No. of leaves/ shoot | | Leaf area ($cm^2$) | | Wood ripening coefficient | | Cane thickness (cm) | | Pruning wood weight (kg.)/vine | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 |
| **Control (sprayed with water)** | 97.5 | 101.0 | 14.0 | 13.0 | 101.0 | 101.9 | 0.69 | 0.68 | 1.09 | 1.10 | 1.29 | 1.24 |
| **Rocket sprout extract at 0.5%** | 101.0 | 104.6 | 16.0 | 15.0 | 103.6 | 105.0 | 0.75 | 0.76 | 1.16 | 1.16 | 1.35 | 1.36 |
| **Rocket sprout extract at 1.0%** | 105.0 | 110.0 | 18.0 | 18.0 | 105.5 | 107.9 | 0.80 | 0.81 | 1.23 | 1.24 | 1.41 | 1.42 |
| **Rocket sprout at 2.0%** | 105.6 | 110.6 | 18.0 | 18.0 | 106.0 | 108.0 | 0.81 | 0.82 | 1.24 | 1.25 | 1.42 | 1.43 |
| **Fenugreek seed sprout extract at 0.5%** | 109.9 | 116.6 | 20.0 | 20.0 | 110.0 | 112.0 | 0.85 | 0.90 | 1.31 | 1.33 | 1.50 | 1.49 |
| **Fenugreek seed sprout extract at 1.0%** | 114.9 | 121.6 | 22.0 | 22.0 | 112.9 | 114.0 | 0.90 | 0.91 | 1.37 | 1.40 | 1.56 | 1.54 |
| **Fenugreek seed sprout extract at 2.0%** | 115.1 | 122.0 | 22.0 | 23.0 | 113.0 | 114.4 | 0.91 | 0.92 | 1.38 | 1.41 | 1.57 | 1.55 |
| **New LSD at 5%** | 1.4 | 1.3 | 2.0 | 2.0 | 1.1 | 1.3 | 0.04 | 0.05 | 0.05 | 0.06 | 0.05 | 0.04 |

concentrations namely 1.0 and 2.0%. Using fenugreek seed sprout extract was significantly superior than using rocket seed sprout. The maximum values of these growth measurements were recorded on the vines that treated four times with extract of fenugreek seed sprout at 2.0%. Untreating the vines with any crop seed sprout extract gave the minimum values. These results were true during both seasons.

## Leaf Chemical Components

As shown in Table 4, chlorophylls a and b, total carotenoids, N, P, K and Mg in the leaves were significantly enhanced in response to treating the vines with any of the two crop seed sprouts at 0.5 to 2.0% compared to the control treatment. There was a gradual promotion on these chemical components with increasing concentrations of fenugreek and rocket seed sprout extracts from 0.5 to 2.0%. Treating the vines with extract of fenugreek seed sprout was significantly superior than using rocket seed sprout in the two seasons. Increasing concentration of both crop seed sprout extracts from 1.0 to 2.0% had no significant promotion among them on these chemical constituents. The maximum values were recorded on the vines that treated four times with fenugreek seed sprout extract at 2.0% in both seasons. The untreated vines produced the lowest values. Similar trend was noticed during both seasons.

## Percentage of Berry Setting, Yield and Cluster Aspects

Results in Table 5 clearly show that subjecting the vines to extracts of fenugreek or rocket seed sprout each at 0.5 to 2.0% significantly was responsible for improving percentage of berry setting, yield expressed in weight and number of clusters/vine as well as weight and dimensions of cluster relative to the check treatment. The promotion was in proportional to the increase in concentrations of both materials. Using extract of fenugreek seed sprout was significantly preferable than using extract of rocket seed sprout in improving berry setting, yield and cluster aspects. No significant promotion was detected on these parameters among the higher two concentrations namely (1.0 and 2.0%), therefore, the recommended concentration from economical point of view was 1%. From economical point of view, using fenugreek seed sprout extract at 1% gave the best results with regard to yield. Under such promised treatment, yield per vine reached 10.0 and 14.0 kg compared with the yield of untreated vines that reached 8.2 and 8.4 kg during both seasons,

**Table 4. Effect of rocket and fenugreek seed sprout extracts foliar spray on some leaf chemical components of Flame seedless grapevines during 2015 and 2016 seasons**

| Treatment | Chlorophyll a (mg/ g FW) | | Chlorophyll b (mg/ g FW) | | Total carotenoids (mg/g FW) | | Leaf N (%) | | Leaf P (%) | | Leaf K (%) | | Leaf Mg (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 |
| Control (sprayed with water) | 3.9 | 4.0 | 1.1 | 1.0 | 0.9 | 1.1 | 1.57 | 1.61 | 0.13 | 0.14 | 1.11 | 1.14 | 0.56 | 0.59 |
| Rocket sprout extract at 0.5% | 4.6 | 4.5 | 1.4 | 1.4 | 1.2 | 1.3 | 1.63 | 1.67 | 0.17 | 0.17 | 1.17 | 1.49 | 0.60 | 0.63 |
| Rocket sprout extract at 1.0% | 5.1 | 5.0 | 1.7 | 1.8 | 1.6 | 1.5 | 1.70 | 1.72 | 0.20 | 0.20 | 1.23 | 1.25 | 0.65 | 0.66 |
| Rocket sprout at 2.0% | 5.2 | 5.1 | 1.8 | 1.9 | 1.7 | 1.6 | 1.71 | 1.73 | 0.21 | 0.21 | 1.24 | 1.26 | 0.66 | 0.67 |
| Fenugreek seed sprout extract at 0.5% | 5.6 | 5.7 | 2.4 | 2.5 | 2.1 | 1.9 | 1.77 | 1.81 | 0.25 | 0.24 | 1.30 | 1.31 | 0.71 | 0.70 |
| Fenugreek seed sprout extract at 1.0% | 6.1 | 6.3 | 2.7 | 3.0 | 2.4 | 2.2 | 1.83 | 1.90 | 0.29 | 0.27 | 1.35 | 1.36 | 0.75 | 0.73 |
| Fenugreek seed sprout extract at 2.0% | 6.2 | 6.4 | 2.8 | 3.1 | 2.5 | 2.3 | 1.84 | 1.91 | 0.30 | 0.28 | 1.36 | 1.37 | 0.76 | 0.74 |
| New LSD at 5% | 0.4 | 0.5 | 0.2 | 0.3 | 0.2 | 0.2 | 0.04 | 0.05 | 0.04 | 0.03 | 0.04 | 0.04 | 0.03 | 0.02 |

**Table 5. Effect of rocket and fenugreek seed sprout extracts foliar spray on the percentage of berry setting, yield, cluster weight and dimensions (length and width) and berries colouration of Flame seedless grapevines during 2015 and 2016 seasons**

| Treatment | Berry setting (%) | | No. of clusters/ vine | | Yield/ vine (kg.) | | Cluster weight (g) | | Cluster length (cm) | | Cluster width (cm) | | Berries colouration (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 |
| Control (sprayed with water) | 13.0 | 12.9 | 24.0 | 24.0 | 8.2 | 8.4 | 341 | 351 | 15.1 | 15.8 | 10.1 | 10.5 | 59.90 | 60.10 |
| Rocket sprout extract at 0.5% | 14.6 | 15.0 | 25.0 | 26.0 | 8.9 | 9.5 | 357 | 367 | 15.7 | 16.5 | 10.7 | 11.1 | 61.91 | 64.11 |
| Rocket sprout extract at 1.0% | 16.0 | 16.9 | 25.0 | 29.0 | 9.3 | 11.0 | 371 | 381 | 16.3 | 17.5 | 11.5 | 12.1 | 64.91 | 66.99 |
| Rocket sprout at 2.0% | 16.1 | 17.0 | 25.0 | 30.0 | 9.3 | 11.5 | 373 | 382 | 16.4 | 17.6 | 11.6 | 12.2 | 65.00 | 67.11 |
| Fenugreek seed sprout extract at 0.5% | 17.4 | 18.1 | 25.0 | 32.0 | 9.7 | 12.7 | 386 | 397 | 17.1 | 18.2 | 12.5 | 13.4 | 71.91 | 73.11 |
| Fenugreek seed sprout extract at 1.0% | 18.5 | 19.5 | 25.0 | 34.0 | 10.0 | 14.0 | 401 | 411 | 18.4 | 19.0 | 13.4 | 14.4 | 77.92 | 80.00 |
| Fenugreek seed sprout extract at 2.0% | 18.6 | 19.6 | 25.0 | 34.0 | 10.1 | 14.0 | 402 | 412 | 18.5 | 19.1 | 13.5 | 14.5 | 78.11 | 80.60 |
| New LSD at 5% | 0.9 | 1.0 | NS | 2.0 | 0.3 | 0.6 | 11 | 11 | 0.5 | 0.6 | 0.5 | 0.4 | 1.12 | 1.13 |

respectively. The percentage of increment due to using the suggested treatment over the control treatment reached 22.0 and 66.7% during both seasons, respectively. The present treatments had no significant effect on the number of clusters in the first season only.

## Percentage of Berries Colouration

As shown in Table 5, percentage of berries colouration was significantly enhanced in response to treating the vines with extracts of fenugreek or rocket seed sprouts each at 0.5 to 2% relative to the check treatment. The promotion was associated with increasing concentrations of each material. Using fenugreek seed sprout extract significantly was accompanied with enhancing berries colouration (%) compared to the use of rocket seed sprout extract in both seasons. The best results were observed on the vines that treated four times with fenugreek seed sprout extract at 2.0%. Under such promised treatment, values of berries colouration during both seasons were 78.11 and 80.60%, respectively. The lowest values of berries colouration (%) (69.6 and 60.10%) were recorded on untreated vines. These results were true during both seasons.

## Physical and Chemical Characteristics of the Berries

It can be stated from the results in Table 6 that treating Flame seedless grapevines four times with fenugreek or rocket seed sprouts each at 0.5 to 2.0%, significantly was accompanied with improving berries quality in terms of increasing berry weight and dimensions (longitudinal and equatorial), TSS (%), total sugars (%) and total anthocyanins and decreasing total acidity (%) compared to the control treatment. The promotion was related to the increase in concentrations of both materials. Using fenugreek seed sprout extract was significantly preferable than using rocket seed sprout extract in improving quality of the berries in the two seasons. Increasing concentrations from 1.0 to 2.0% failed to show significant promotion on quality parameters. Therefore, the best results with regard to berries quality from economical point of view were obtained on the vines that treated with fenugreek seed sprout extract at 1.0%. Unfavourable effects on berries quality were observed on the untreated vines. Similar results were announced during both seasons.

**Table 6. Effect of rocket and fenugreek seed sprout extracts foliar sprays on some physical and chemical characteristics of the berries of Superior grapevines during 2015 and 2016 seasons**

| Treatment | Berry weight (g) | | Berry longitudinal (cm) | | Berry equatorial (cm) | | TSS (%) | | Total sugars (%) | | Total acidity (%) | | Total anthocynans (mg/100 g) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 | 2015 | 2016 |
| **Control (sprayed with water)** | 4.11 | 4.20 | 1.59 | 1.61 | 1.22 | 1.23 | 17.7 | 18.0 | 14.9 | 15.0 | 0.70 | 0.718 | 21.9 | 22.3 |
| **Rocket sprout extract at 0.5%** | 4.41 | 4.50 | 1.64 | 1.66 | 1.28 | 1.29 | 18.1 | 18.4 | 15.3 | 15.4 | 0.68 | 0.691 | 24.1 | 25.0 |
| **Rocket sprout extract at 1.0%** | 4.77 | 4.86 | 1.69 | 1.72 | 1.33 | 1.35 | 18.6 | 18.8 | 15.5 | 15.8 | 0.661 | 0.671 | 28.8 | 29.1 |
| **Rocket sprout at 2.0%** | 4.80 | 4.89 | 1.70 | 1.73 | 1.34 | 1.36 | 18.7 | 18.9 | 15.6 | 15.9 | 0.659 | 0.669 | 28.3 | 29.2 |
| **Fenugreek seed sprout extract at 0.5%** | 5.00 | 5.09 | 1.77 | 1.79 | 1.40 | 1.41 | 19.1 | 19.4 | 16.0 | 16.4 | 0.630 | 0.640 | 31.3 | 32.0 |
| **Fenugreek seed sprout extract at 1.0%** | 5.31 | 5.40 | 1.86 | 1.85 | 1.45 | 1.47 | 19.6 | 19.8 | 16.4 | 16.8 | 0.610 | 0.618 | 35.0 | 35.8 |
| **Fenugreek seed sprout extract at 2.0%** | 5.32 | 5.41 | 1.87 | 1.86 | 1.46 | 1.48 | 19.7 | 19.9 | 16.5 | 16.9 | 0.608 | 0.617 | 35.3 | 36.0 |
| **New LSD at 5%** | 0.10 | 0.08 | 0.04 | 0.04 | 0.05 | 0.05 | 0.3 | 0.3 | 0.2 | 0.3 | 0.018 | 0.019 | 2.1 | 1.9 |

## DISCUSSION

The outstanding effect of fenugreek and rocket seed sprouts on fruiting of Flame seedless grapevines might be attributed to their higher content of amino acids, vitamins and nutrients (Camacho *et al.,* 1992; Cairney, 1995; Abdallah *et al.,* 2000; Cazoula *et al.,* 2004; Crews and Peoples, 2004; Cairney, 2005; Blommerson, 2007; Abdallah, 2008). The obtained results are in agreement with those of Darwish (2009), Anderson and Cedergreen (2010), Al- Shereif *et al.* (2013), El-Sayed (2014), El- Khawaga and Mansour (2014), Ahmed and Habasy (2014), Mohamed (2014), Refaai (2014a) and (2014b) and Abd El-Rahman (2015).

### Conclusion

The investigated parameters were unaffected with increasing the concentration from 1.0 to 2.0% from each material. Fenugreek seed sprouts was superior than using rocket seed sprout in this respect. Carrying out four sprays of extract of fenugreek seed sprouts at 1.0% was responsible for improving yield and berries quality of Flame seedless grapevines.

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## تأثير الرش بمستخلصات نبت بذور الجرجير والحلبة على كمية وجودة المحصول فى كرمات العنب الفليم سيدلس

**أسماء أنور إبراهيم**

قسم بحوث العنب – معهد بحوث البساتين – مركز البحوث الزراعية – الجيزة – مصر

أجريت هذه الدراسة خلال موسمى ٢٠١٥، ٢٠١٦ فى منطقة سمالوط، محافظة المنيا وذلك لدراسة تأثير رش مستخلص نبت بذور الجرجير أو الحلبة بتركيز ما بين ٠,٥ إلى ٢% علي صفات النمو الخضرى، الحالة الغذائية للكرمة والنسبة المئوية لعقد الحبات والنسبة المئوية لتلوين الحبات وكمية المحصول فى كرمات العنب الفليم سيدلس، كان هناك تحسن واضح فى جميع صفات النمو الخضرى وصبغات الورقة والعناصر الغذائية والنسبة المئوية لعقد الحبات وكمية المحصول للكرمة والنسبة المئوية لتلوين الحبات وخصائص الجودة للحبات وذلك عند معاملة الكرمات أربع مرات بمستخلص نبت بذور الجرجير أو الحلبة بتركيز ما بين ٠,٥ إلى ٢% وذلك بالمقارنة بمعاملة الكونترول وكان التحسن متناسبا مع زيادة التركيز المستخدم من مستخلص نبت بذور الجرجير أو الحلبة ولقد تفوق استخدام مستخلص نبت بذور الحلبة عن مستخلص نبت بذور الجرجير فى هذا الصدد، لأجل تحسين كمية المحصول وجودة الحبات فى كرمات العنب الفليم سيدلس فانه يفضل رش مستخلص نبت بذور الحلبة أربع مرات بتركيز ١%.

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