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EFFECTOF PINCHING LEVELS ON SUB CAN DEVELOPMENT IN FLAME SEEDLESS AND SHARAD SEEDLESS

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ABSTRACT

Influence of pinching level on sub cane development in Flame seedless and Sharad seedless. The vines were halt at seven different nodes levels in a randomized block design with five replications. Results revealed that, lesser day taken for bud sprout from pruning (16.59 Flame seedless and 18.03 Sharad seedless)number of buds sprout per spur (3.79 Flame seedless and 3.39 Sharad seedless) lesser inter nodal length (3.71 cm Flame seedless and 3.35cm Sharad seedless)total leaf area(2583.62 cm^2 Flame seedless and 2559.61cm^2) Sharad seedless) (maximum cane length at 5^{th}leaf, 10^{th}leaf and 15^{th}leaf in T_7Flame seedless and at 5^{th}leaf, 10^{th}leaf, 15^{th}leafin T_7Sharad seedless)(maximum cane diameter T_1Flame seedless and T_1Sharad seedless)Petiole nutrient contents NPK percentage (2.82%, 0.89%, 2.88% Flame seedless and 2.81%, 0.82%, 2.86%Sharad seedless).

KEYWORDS: Pinching Levels, Flame Seedless, Sharad Seedless, Grape

INTRODUCTION

The grape cv. Flame seedless and Sharad seedless are gaining popularity among the grape growers in Southern India. It is universally recognised fact that the yield of grape vine is profoundly influenced by the method of pinching. According to (Lovisolo and Schubert 2000) pinching is the sole means of regulating not only the quantity and quality of grapes during a particular season but also the quantity of next years. The knowledge of flowering and fruit development in relation to growth pattern of the cultivar under different agro-climatic regions is of great importance for a judicious pinching programme. The quality of grape was affected with the number of buds on the cane (Sommer *et al.,* 2000) with increase in cane length, sprouting of the basal buds was depressed. The process of bud differentiation during foundation phase determines fruitfulness in grape it is also depend on CHO content and other nutrient through biochemical reaction as well as the utilization of light is governed by the canopy arrangements. The fruitfulness take place after back pruning during this period light is more important for effective fruitfulness where the pinching level plays major role (Sommer *et al.*,2000) therefore it was thought desirable to conduct a pinching trail on these varieties to see the effect of pinching severity on sprouting, flowering and other parameters. The present study was aimed to investigate the effect of pinching levels on sub can development in Flame seedless and Sharad seedlessunder mild tropics..

MATERIALSAND METHODS

The present investigation influence of pinching levels on sub can development in Flame seedless and Sharad seedless varieties under mild tropics was undertaken at Indian Institute of Horticultural Research Hesserghatta, Bangalore during 2014-2015. On nine years old grapevines which were trained on extended ‘Y’ trelliesspaced at 3.0 x 1.8 m apart.

For winter season all the canes pruned up to 1 bud level for vegetative growth. vines were pruned on April, 2014 with seven pinching intensities replicated five times in a randomized block design. The following halting treatments were applied.

Table 1: Treatment Details

Flame Seedless		Sharad Seedless	
Treatment	Treatment details	Treatment	Treatment details
T_1	Halt at 3th node & 1sub cane	T_1	Halt at 4th node & 1 sub cane
T_2	Halt at 3th node & 2 sub canes	T_2	Halt at 4th node & 2 sub canes
T_3	Halt at 4th node & 1 sub cane	T_3	Halt at 5th node & 1 sub cane
T_4	Halt at 4th node & 2 sub canes	T_4	Halt at 5th node & 2 sub canes
T_5	Halt at 5th node & 1 sub cane	T_5	Halt at 6th node & 1 sub cane
T_6	Halt at 5th node & 2 sub canes	T_6	Halt at 6th node & 2 sub canes
T_7	No halting (Straight cane)	T_7	No halting (Straight cane)

RESULTS AND DISCUSSION

The results of the present investigation as well as relevant discussion have been summarized under following heads:

Vegetative Attributes

Number of Day for Bud Sprout From Pinching

The different severity of cane halting had exhibited significant effect on the period required for bud sprout in both verities of grape *i.e.* Flame seedless and Sharad seedless. In variety Flame seedless (Table 2), the canehalt at 3th node & 1sub canehastened the bud sprout by about 5 days (16.59 days) as compared tono halting straight cane (21.36 days). Similarly, in variety Sharad seedless also canehalt at 4th node & 1 sub canetook (18.03 days) for bud sprouting which was about 5 days earlier than no halting straight cane (23.68 days). Thus from the above results, it is clear that, with the decrease in cane halting severity, the time required for bud sprout increased. Bhosale *et al.* (2010) and Avenant (2006)

Buds Sprout per Spur

Number of buds sprout per spur was significantly influenced by the cane halting severity. Maximum bud sprouted per spur in variety Flame seedless (3.79) were observed in treatment 3th node & 1sub cane and minimum buds sprouted per spur (1.91) in treatmentno halting straight cane. However in Sharad seedless maximum (3.39) and minimum (1.77) buds sprouted per spur were observed in treatment no halting straight cane respectively. Numbers of buds sprouted per spur were increased with increase in pruning severity. These finding are in close conformity with the observation recorded by Kok *et al.*,(2013)Celia *et al.*, (2007)

Internodal Length

Internodal length per cane were significantly, influenced by the cane halting treatment. Minimum interrnodal length per cane in variety Flame seedless (3.71 cm) were observed in3th node & 1sub caneand maximum (5.38cm) internodallength per canerecordedinno halting straight cane. However, in Sharad seedless minimum (3.35 cm) and maximum (5.56) were observed in4th node & 1sub cane treatment and no halting straight cane respectively. Internodal lengths per cane were decrease due to ABA accumulation in cane and increase in cane pruning severity. These findings are

in close conformity with the observation recorded by (Mandeep and Sharma, 2005) and Cecilia *et al*., (2006)

Leaf Area

Maximum leaf area (2583.62 cm^2) were found in 3^{th} node 1 sub cane and minimum (2210.21cm^2) noticed in no halting straight cane, while in case of Sharad seedless variety maximum leaf area (2559.61 cm^2) were observed in4^{th} node 1sub cane and minimum (1915.93 cm^2) were recorded inno halting straight cane. They pointed out necessity of higher temperature for better regulative growth (Ramteke and Somkumar, 2005)Due to sever pruning carbohydrates accumulated before pruning in the vine diverted towards regulative growth thereby increase shoot length as shoot length increase number of leaves and leaf area increased.

Cane Length and Diameter

Higher cane length (Table 3) was recorded at various stages namely 5^{th}, 10^{th} and 15^{th} leaf stages. As regard cane pruning severity no halting straight cane recorded maximum cane length at 5^{th} leaf stage (21.46 cm) 10^{th}leaf (47.81 cm) and 15^{th}leaf (95.08 cm) and maximum diameter were observed at 3^{th} node 1sub cane5^{th} leaf (4.59 cm) 10^{th}leaf (5.56 cm) and 15^{th}leaf (9.65 cm) while it was minimum with no halting straight cane in Flame seedless. Similar results were obtained in case of Shard seedless. This showed that, severe the pruning, less was the length of the cane and severe the pruning higher the diameter of cane, the cane growth was found to be higher. The cane length and diameter was influenced greatly by the reserves carbohydrates in the trunk and canes left over after pruning. Similar results were obtained earlier by Josan *et al.*,(2001)

Petiole Nutrient Content Percentage

Fruiting is an exhaustive process and heavy crop load generally leads to depletion of nutrient reserves of the vine resulting in early senility(Table 4) In this contextpetiole analysis of the vine was taken up for major nutrients like (nitrogen, phosphorus and potassium). Significantly maximum petiole nutrient contents total nitrogen (2.82 %) phosphors (0.89 %) potassium (2.88 %) recorded in 3^{th} node 1 sub cane & 1 bud while minimum total nitrogen, phosphors and potassium were observed inno halting straight cane in Flame seedless in case of Sharad seedless total nitrogen (2.81 %), phosphors (0.82 %) and potassium (2.86 %) was higher in 4^{th} node 1 sub cane, while it was minimum with no halting straight cane. No halting straight cane exhibited lower level of nutrients in the petiole due to relatively more number of fruiting canes per vine, competing for drawing more nutrients for development of bunches indicating higher depletion of nutrients due to heavy crop load. This finding was strongly supported by the results of(Mohammad *et al*., 2011)

CONCLUSIONS

From the above results it can be suggested that among different cane pruning severity cane halt at 3^{th} node 1 sub cane resulted significantly maximum and highly significant growth attributes of good quality of grape in Flame seedless. Whereas, in Sharad seedless cane halt at 6^{th} node 1 sub cane was found significantly superior then the rest of treatments. Since the result presented have pertained to only one season, therefore, it will be desirable to continue further study for confirmation of the result.

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APPENDIES

Table 2: Effect of Pinching Levels on Growth Parameters in Grapes cv. Sharad Seedless (Back Pruning) 2014-15

Treatments	Flame Seedless				Sharad Seedless			
	No. of Days for Bud Sprouting From Pruning	No. of Buds Sprouted Per Spur	Inter Nodal Length (Cm) (3^{th}-5^{th}) Node	Total Leaf Area Per Shoot (Cm^2)	No. of Days for Bud Sprouting From Pruning	No. of Buds Sprouted Per Spur	Internodal Length (Cm) (4^{th}-6^{th})Node	Total Leaf Area Per Shoot (Cm^2)
T_1	16.59	2.29	3.71	2409.80	18.03	2.98	3.49	2449.65
T_2	17.34	2.49	3.98	2410.42	18.74	2.56	3.94	2405.03
T_3	16.39	3.79	3.43	2583.62	19.25	2.89	3.73	2349.60
T_4	17.79	3.08	4.42	2314.14	20.04	2.54	4.28	2238.40
T_5	17.96	2.84	4.56	2308.91	19.70	3.39	3.35	2559.61
T_6	18.78	2.47	4.60	2328.28	21.20	2.58	4.29	2430.26
T_7	21.36	1.91	5.38	2210.21	23.68	1.77	5.56	1915.93
Em.+	0.27	0.16	0.09	11.29	0.22	0.22	0.17	19.21
C.D. @5%	0.79	0.47	0.27	32.96	0.65	0.65	0.49	56.08
CV %	3.35	12.76	4.73	1.07	2.46	18.71	9.10	1.84

Table 3: Effect of Pinching Level on Cane Length and Diameter of Grapes in Variety Flame Seedless and Sharad Seedless

Treatments	Flame Seedless						Sharad Seedless					
	Cane Length (cm)			Cane Diameter (mm)			Cane Length(cm)			Cane Diameter(mm)		
	5^{th}leaf	10^{th}leaf	15^{th}leaf	5^{th} leaf	10^{th} leaf	15^{th} leaf	5^{th}leaf	10^{th}leaf	15^{th} leaf	5^{th}leaf	10^{th} leaf	15^{th} leaf
T_1	14.93	30.94	73.60	4.05	5.55	9.65	15.06	30.74	73.51	4.12	6.39	9.45
T_2	14.52	37.98	77.17	3.68	5.44	9.58	14.94	37.86	76.92	4.40	6.36	9.58
T_3	16.69	39.07	76.19	4.59	5.56	9.49	16.90	39.11	78.40	3.96	6.10	9.57
T_4	16.89	35.27	79.61	3.53	5.48	8.74	17.49	39.90	79.14	3.78	5.77	8.95
T_5	17.79	40.42	83.14	3.64	4.86	8.56	17.97	42.76	83.43	4.40	5.50	9.55
T_6	18.24	43.52	85.18	3.18	4.45	8.11	19.00	42.20	85.70	3.41	4.97	8.54
T_7	21.46	47.81	95.08	1.88	3.37	6.31	22.16	48.23	95.96	1.63	3.03	5.93
S. Em. ±	0.25	0.51	0.54	0.19	0.09	0.18	0.22	0.67	0.64	0.21	0.22	0.21
C.D. @5%	0.72	1.49	1.59	0.55	0.27	0.54	0.64	1.96	1.86	0.61	0.63	0.60
CV %	3.19	2.90	1.50	11.99	4.21	4.77	2.77	3.74	1.74	12.83	8.83	5.23

Table 4: Effect of Pinching Levelon Petiole Nutrient Content Spercentage of Grapes in Variety Flame Seedless and Sharad Seedless

Treatments	Flame Seedless			Sharad Seedless		
	Total Nitrogen Content (%)	Total Phosphors Content (%)	Total Potassium Content (%)	Total Nitrogen Content (%)	Total Phosphors Content (%)	Total Potassium Content (%)
T_1	2.82	0.89	2.88	2.81	0.78	2.86
T_2	2.79	0.86	2.79	2.81	0.79	2.85
T_3	2.81	0.77	2.79	2.79	0.81	2.80
T_4	2.74	0.74	2.77	2.76	0.80	2.78
T_5	2.82	0.79	2.77	2.76	0.82	2.77
T_6	2.73	0.78	2.73	2.75	0.81	2.75
T_7	2.22	0.69	2.26	2.64	0.62	2.24
S. Em. ±	0.03	0.01	0.01	0.01	0.02	0.01
C.D.@5%	0.08	0.03	0.04	0.04	0.05	0.04
CV %	2.40	3.39	1.01	1.07	5.38	1.11