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GROWTH, YIELD AND QUALITY OF SNAKE GOURD (*TRICHOSANTHES CUCUMERINA* L.) VARIETIES AS INFLUENCED BY PRUNING PRACTICE

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ABSTRACT

The experiment was conducted during the summer of 2023-24 at the Experimental Farm of the Department of Horticulture, Assam Agricultural University, Jorhat. Nine treatments were applied in the study, with three replications, involving two factors. The first factor included three varieties: V_1 (CO-2), V_2 (Kaumudi) and V_3 (Green Snake). The second factor consisted of three pruning practices: P_1 (two primary branches + four secondary branches), P_2 (two primary branches + six secondary branches) and P_3 (no pruning). The varieties and pruning practices significantly influenced various parameters. The growth, flowering and yield parameters like highest tertiary branches per plant, minimum days and lowest nodal position to first female flower, maximum female flowers per plant, lowest sex ratio, minimum day to first fruit picking and maximum fruits per plant was observed under V_3P_2. Minimum days to first male flower was seen in V_3P_3. Maximum male flowers per plant was noticed in V_1P_3. Maximum days to last fruit picking was found in V_1P_1. Highest fruit length, fruit diameter, maximum fruit yield per plant and hectare was obtained under V_2P_2. For quality and physiological parameters like highest ascorbic acid and crude fibre content was observed in V_3P_2. The highest moisture percentage and relative leaf water content was observed in V_3P_1. Maximum leaf chlorophyll content was observed in V_2P_2. Highest benefit cost ratio *i.e.* (4.90) was found in T_5 treatment (Kaumudi with two primary branches + six secondary branches).

***Key words*:** Growth, flowering, yield, quality, varieties, pruning practice

Introduction

Indian vegetable agriculture places a high value on the Cucurbitaceae family, which includes a wide variety of summer vegetables. These veggies are essential to everyday diets and are valued for both their nutritional content and therapeutic qualities. According to (Jeffrey, 1990), the Cucurbitaceae family includes 825 species and 118 genera. Of these, about 100 species and 37 generaboth cultivated and wild have been found in India. Cucurbits are generally day-neutral plants, while there are several exceptions and variances (Seshadri and More, 2009). In India, half of the sixty cucurbit crops grown are native to the nation. The genus *Trichosanthes* contains forty-four species, twenty-two of which are found in India (Chakravarthy, 1982), mostly around the Western Ghats' Malabar Coast, the Eastern Ghat's low and medium elevation zones and the North Eastern Hill (NEH) region. Because it is monoecious, the annual, day-neutral, herbaceous, climbing vegetable crop *Trichosanthes cucumerina* L. (2n=2x=22), also referred to as snake

gourd, is heavily reliant on cross-pollination. *Trichosanthes* is a member of the Cucurbitaceae family and is thought to be indigenous to India, the Indo-Malayan region *or* the Indian Archipelago (Gopalan *et al.*, 1982; Khatun *et al.*, 2010).

The vegetable is referred to by several names in different places, such as *baupngu* in Thailand, *pakupis* in the Philippines and*snake tomato* in Nigeria. According to (Echo, 2006), it is known by several names in India, including *dhunduli* in Assam, *chichinda* in Hindi, *paduvalakaayi* in Kannada, *potlakaaya* in Telugu, *pudalankaai* in Tamil and *padavalanga* in Malayalam. It is a healthy addition to meals because it is an excellent source of minerals, fibre and nutrients (Ahmed *et al.*, 2000). However, it also has a lot of protein, fat, minerals, fibre and carbohydrates. Because of its high content of flavonoids, carotenoids, phenolic acids and other substances, it has therapeutic value. Potassium, phosphorus, sodium, magnesium and zinc are important mineral elements (Ojiako and Igwe, 2008). It is used in Ayurvedic and Siddha medicine and is well known for its pharmacological and therapeutic qualities, including anti-inflammatory, hepatoprotective, cytotoxic and anti-diabetic actions.

Because of their extraordinary capacity for regeneration, plants can regrow organs that have been removed by accident, injury or deliberate removal by animals or farmers. Growers frequently use pruning, which is the intentional removal of extra or unwanted plant components, to manage stature, shape plants and promote reproductive stages (Anon, 2018). Pruning also helps to create a balance between fruit output and vegetative development (Anwar *et al.*, 2019). Pruning must be done well before the flowering period in order to promote the growth of reproductive or floral buds. Despite the need of pruning, little is known about the best ways to prune snake gourds. Being a multi-harvest crop, pruning practices have a significant impact on plant development and population, which in turn affects productivity. As a result, encouraging appropriate pruning techniques will help farmers produce off-season crops and increase yield and quality, which will raise market prices. The experiment's main objectives were to determine which variety reacts best to pruning techniques and to investigate the effects of pruning on growth, flowering, yield and quality.

Materials and Methods

The study was carried out in the Experimental Farm of the Department of Horticulture, Assam Agricultural University, Jorhat-13, during the summer of 2023–2024.

Table 1: Treatment combinations.

Treatment	Treatment Combinations
T_1	V_1P_1 (CO-2 + Two primary branches + four secondary branches)
T_2	V_1P_2 (CO-2 + Two primary branches + six secondary branches)
T_3	V_1P_3 (CO-2 + No pruning)
T_4	V_2P_1 (Kaumudi + Two primary branches + four secondary branches)
T_5	V_2P_2 (Kaumudi + Two primary branches + six secondary branches)
T_6	V_2P_3 (Kaumudi + No pruning)
T_7	V_3P_1 (Green Snake + Two primary branches + four secondary branches)
T_8	V_3P_2 (Green Snake + Two primary branches + six secondary branches)
T_9	V_3P_3 (Green Snake + No pruning)

The experimental site is situated at 26° 47' N latitude and 94° 122' E longitude, at a height of 96.6 meters above mean sea level. The region has good drainage and slope characteristics.

Layout and preparation of experimental plot: The experiment was set out using a Factorial Randomised Block Design and included nine treatments each with two factors that were replicated three times, treatment combination has been depicted in Table 1. A strong crop stand was ensured by using standard agricultural methods, which started with the experimental plot being fully prepared by ploughing, harrowing and levelling. Next, 27 plots total each with nine plots were created from the full plot in three replications. The plots/beds are each 4.00 m × 1.50 m, with 0.60 m separating each plot in a column and 0.50 m between plot rows. Next, a mixture of top soil and cow manure was poured into 30 cm^3 trenches. The seeds in the pits were spaced 2.00 m apart by 0.75 m. Recommended dose of FYM @ 15t/ha along with inorganic fertilizers, N: P_2O_5: K_2O @ 45: 30: 30 kg/ha in the form of Urea, SSP and MOP respectively, was applied at the time of final field preparation.

Description of Treatments

Factor A: Varieties

V_1: CO-2, V_2:Kaumudi and V_3: Green Snake

The CO-2 variety is pure line selection from local type of Coimbatore district. Kaumudi is a high yielding variety released from the Kerala Agricultural University. Green Snake is a local selection variety from Assam.

Factor B : Pruning practice

P_1 : Two primary branches + four secondary

branches, P_2 : Two primary branches + six secondary branches and P_3 : No pruning

In order to prevent competition between plants for better sunshine and nutrients, each pit was first sowed with two seeds. Once the seedlings emerged, the plot was thinned to leave four plants per plot. When the seedlings were firmly established, about 20 days following sowing, the plants were staked. Bamboo tops were used for staking. Twenty-five to thirty days after seeding, the tip of the main branch was pruned with secateurs, heading back at the sixth node above ground level. Additional apical bud, as soon as plant branching begins, branches are pinched in accordance with the treatments.

Growth and flowering metrics were examined, including the number of tertiary branches per plant, the number of male and female flowers per plant, the number of male and female flowers per plant, the number of days until the first male and female flower appeared, the nodal position of the first female flower and the sex ratio. Fruit length (cm) and diameter (cm), number of fruits per plant, days to first and last fruit picking, fruit production per plant (kg) and yield (q/ha) were all recorded, along with other yield-attributing factors. In order to investigate how pruning practices affect the snake gourd types, qualitative and physiological metrics such ascorbic acid content (mg/100g), crude fibre (%), moisture percentage (%), leaf chlorophyll content (spad) and relative leaf water content (%) were also looked at.

Statistical analysis: According to (Fisher and Yates, 1963) analysis of variance (ANOVA) approach for Factorial Randomised Block Design (FRBD) was used to tabulate and statistically analyse the data on all the growth, flowering, yield and quality criteria. After that, the obtained mean values were used in a statistical analysis. The significance level for the F test was set at P=0.05. If the F test was found to be significant, critical difference values were then calculated.

Result and Discussion

Growth and flowering parameters

Number of tertiary branches per plant: The highest number of tertiary branches (13.22/plant) was recorded in the Green Snake variety and under the pruning practice (Two primary branches + six secondary branches) (14.56/plant). The interaction effect of varieties and pruning practice also showed significant difference and has been depicted in Table 2, the highest number of tertiary branches (16.33/plant) was observed in Green Snake variety and under the pruning practice (Two primary branches + six secondary branches). This is because pruning removes dominant shoot tips that inhibit the growth of secondary branches. The increase in the number of tertiary branches resulting from pinching secondary laterals on the apical bud occurs because the auxins concentrated in the tips are redirected to the lower parts of the plant, this redirection makes the plant more physiologically active, leading to a greater production of tertiary branches and leaves in the treated plants (Anand *et al.,* 2014).

Table 2: Growth and flowering parameters.

Treatments	NTBP	DAFM	DAFF	NPFF	NMFP	NFFP	SR
Factor 1: Varieties (V)							
V_1	10.22	45.40	46.86	15.16	360.22	30.22	11.91
V_2	11.78	37.92	44.20	15.27	358.89	28.94	12.65
V_3	13.22	34.11	37.88	12.29	352.11	32.78	10.74
S.Ed ±	0.31	0.89	0.88	0.76	4.66	0.86	0.34
CD(0.05)	0.66	1.88	1.87	1.61	6.59	1.82	0.72
Factor 2: Pruning practice (P)							
P_1	12.11	40.24	42.35	13.71	347.55	29.56	11.75
P_2	14.56	39.95	40.80	13.30	308.56	35.11	8.79
P_3	8.56	37.24	45.80	15.69	415.11	27.28	15.26
S.Ed ±	0.31	0.89	0.88	0.76	4.66	0.86	0.34
CD(0.05)	0.66	1.88	1.87	1.61	6.59	1.82	0.72
Interaction (V × P)							
V_1P_1	10.33	47.67	45.78	15.03	344.33	29.33	11.73
V_1P_2	13.67	46.42	44.27	14.77	310.67	34.33	9.05
V_1P_3	6.67	42.11	50.54	15.67	425.67	27.00	15.77
V_2P_1	12.33	38.75	43.76	14.78	355.00	28.33	12.53
V_2P_2	13.67	39.17	42.27	14.25	307.67	32.67	9.42
V_2P_3	9.33	35.86	46.57	16.78	414.00	25.84	16.02
V_3P_1	13.67	34.32	37.51	11.33	343.33	31.00	11.07
V_3P_2	16.33	34.25	35.86	10.89	307.33	38.33	8.01
V_3P_3	9.67	33.75	40.28	14.64	405.67	29.00	13.99
S.Ed ±	0.54	1.54	1.53	1.31	8.08	1.49	0.59
CD(0.05)	1.15	3.26	3.25	2.78	11.42	3.16	1.26

NTBP: Number of tertiary branches per plant, DAFM: Days to appearance of first male flower, DAFF: Days to appearance of first female flower, NPFF: Nodal position of the first female flower NMFP: Number of male flowers per plant, NFFP: Number of female flowers per plant and SR: Sex ratio.

(Here, V_1: CO-2, V_2 : Kaumudi ,V_3 : Green Snake, P_1 : Two primary branches + four secondary branches, P_2 : Two primary branches + six secondary branches, P_3 : No pruning, S.Ed : standard Error of difference and CD : Critical Difference).

Days to appearance of first male and female flower: The minimum number of days (34.11) to first male flower was observed in Green Snake variety and under the pruning practice (No pruning) (37.24), but in case of female flower appearance, the minimum number of days (37.88) to first female flower was observed in Green Snake variety and under the pruning practice (Two primary branches + six secondary branches) (40.80). The

interaction effect of varieties and pruning practice also showed significant difference and has been depicted in Table 2, minimum number of days (33.75) to first male flower appearance and minimum number of days (35.86) to first female flower appearance was found in Green Snake variety under the pruning practice (No pruning) and (Two primary branches + six secondary branches). This could be attributed to the specific genotype of that particular variety. Pruning the main shoot and branches can alter hormone levels and the distribution of assimilates in plants, potentially impacting and modifying the time required for both male and female flowers to bloom (Chapagain *et al.*, 2022).

Nodal position of the first female flower: The lowest node (12.29) to first female flower was observed in Green Snake variety and under the pruning practice (Two primary branches + six secondary branches) (13.30). The interaction effect of varieties and pruning practice also showed significant difference and has been depicted in Table 2, the lowest nodal position (10.89) of the first female flower was observed in Green Snake variety under the pruning practice (Two primary branches + six secondary branches). Pruning frequently leads to female flowers developing at lower nodal positions due to the plant's adaptation to reduced foliage and branch density. Moreover, pruning decreases branch competition, allowing the plant to allocate more energy to reproductive structures at the base (Oga and Umekwe, 2016), thereby encouraging the emergence of female flowers at these lower nodes.

Number of males, female flowers per plant and sex ratio: The maximum number of male flowers (360.22) was observed in CO-2 variety and under the pruning practice (No pruning) (415.11), but in case of female flowers and sex ratio, the maximum number of female flowers (32.78) and lowest sex ratio (10.74) was observed in Green Snake variety and under the pruning practice (Two primary branches + six secondary branches) (35.11) and (8.79). The interaction effect of varieties and pruning practice also showed significant difference and has been depicted in Table 2, the minimum number of male flowers (307.33) per plant, the maximum number of female flowers (38.33) per plant and the lowest sex ratio (8.01) was found in Green Snake variety under the pruning practice (Two primary branches + six secondary branches). When the apical bud was removed, cytokinin levels increased, stimulating the growth of secondary and tertiary branches, which in turn enhanced the production of female flowers at the basal nodes and supressing the male flowers. The sex ratio improved significantly because the translocation of stored materials and a promotion in the C:N ratio led to increased metabolic activity, the production of specific bioregulators likely affected the plant's reproductive system, resulting in a higher number of female flowers relative to male flowers (Anand *et al.*, 2014).

Table 3: Yield and yield attributing parameters.

Treatments	DFFP	DLFP	NFP	FL	FD	FYP	FYH
Factor 1: Varieties (V)							
V_1	57.33	84.11	23.76	26.78	6.19	7.69	312.92
V_2	54.78	82.89	19.09	63.69	6.88	14.53	582.18
V_3	47.00	78.33	24.54	46.44	5.08	9.12	374.43
S.Ed±	0.91	1.15	0.47	0.92	0.11	0.08	5.00
CD(0.05)	1.93	2.43	1.01	1.94	0.23	0.16	10.60
Factor 2: Pruning practice (P)							
P_1	52.33	85.78	21.53	45.86	6.06	10.13	407.07
P_2	51.00	85.44	26.08	47.57	6.21	12.33	499.26
P_3	55.78	74.11	19.78	43.27	5.88	8.88	363.19
S.Ed±	0.91	1.15	0.47	0.92	0.11	0.08	5.00
CD(0.05)	1.93	2.43	1.01	1.94	0.23	0.16	10.60
Interaction (V × P)							
V_1P_1	56.33	90.33	23.44	27.23	6.20	7.51	301.29
V_1P_2	55.00	85.67	27.44	27.77	6.37	9.04	366.12
V_1P_3	60.67	76.33	20.60	25.33	5.99	6.52	271.35
V_2P_1	54.33	85.67	18.06	64.03	6.90	14.00	560.10
V_2P_2	52.67	88.00	22.25	67.17	7.00	17.05	682.74
V_2P_3	57.33	75.00	17.09	59.87	6.73	12.55	503.68
V_3P_1	46.33	81.33	23.25	46.30	5.07	8.88	359.83
V_3P_2	45.33	82.67	28.72	47.80	5.27	10.91	448.92
V_3P_3	49.33	71.00	21.75	45.27	4.92	7.56	314.53
S.Ed±	1.58	1.98	0.82	1.59	0.19	0.13	8.67
CD(0.05)	3.35	4.21	1.74	3.36	0.39	0.28	18.37

DFFP: Days to first fruit picking, DLFP: Days to last fruit picking, NFP: Number of fruits per plant, FL: Fruit length (cm), FD: Fruit diameter (cm), FYP: Fruit yield per plant (kg) and FYH: Fruit yield (q/ha).

(Here, V_1: CO-2, V_2 :Kaumudi ,V_3 : Green Snake, P_1 : Two primary branches + four secondary branches, P_2 : Two primary branches + six secondary branches, P_3 : No pruning, S.Ed : Standard Error of difference and CD : Critical Difference)

Yield and yield attributing parameters

Days to first and last fruit picking: The minimum number of days (47.00) to first fruit picking was observed in Green Snake variety and under the pruning practice (Two primary branches + six secondary branches) (51.00), while the maximum number of days (84.11) to last fruit picking was observed in CO-2 variety and under the pruning practice (Two primary branches + four secondary branches) (85.78). The interaction effect of varieties and pruning practice also showed significant difference and has been depicted in Table 3, the minimum number of days (45.33) to first fruit picking was observed

in Green Snake variety under the pruning practice (Two primary branches + six secondary branches), while the maximum number of days (90.33) to last fruit picking was observed in CO-2 variety under the pruning practice (Two primary branches + four secondary branches). This could be attributed to the specific genotype of that particular variety and also pruning practice significantly impact the timing of fruit picking by enhancing both early and late harvests. Early fruit picking is facilitated by pruning as it improves light exposure and air circulation around the fruits, accelerates fruit development, and optimizes resource allocation to the developing fruits (Oga and Umekwe, 2016). This ensures that fruits mature faster and can be harvested sooner.

Number of fruits per plant: The maximum number of fruits (24.54) per plant was observed in Green Snake variety and under the pruning practice (Two primary branches + six secondary branches) (26.08). The interaction effect of varieties and pruning practice also showed significant difference and has been depicted in Table 3, the maximum number of fruits (28.72) per plant was observed in Green Snake variety under the pruning practice (Two primary branches + six secondary branches). This is because pruning practices boost fruit production by directing the plant's energy and resources towards fewer, more productive shoots. Pruning enhances light penetration and air circulation around the plant, reducing disease risk and supporting healthier growth, which in turn increases fruit set (Anon, 2018).

Fruit length (cm) and diameter (cm): The highest fruit length (63.69 cm) and highest fruit diameter (6.88 cm) was observed in Kaumudi variety and under the pruning practice (Two primary branches + six secondary branches) (47.57 cm) and (6.21 cm). The interaction effect of varieties and pruning practice also showed significant difference and has been depicted in Table 3, the highest fruit length (67.17 cm) and fruit diameter (7.00 cm) was observed in Kaumudi variety under the pruning practice (Two primary branches + six secondary branches). Pruning minimizes competition for nutrients and light among remaining branches, enabling the plant to direct more resources, such as photosynthates and essential nutrients into the fruit, which enhances elongation and overall growth, while also improving airflow and light penetration to further support fruit development (Anand *et al.*, 2014).

Fruit yield per plant (kg) and Fruit yield (q/ha): The maximum fruit yield (14.53 kg/plant) and (582.18 q/ha) was observed in Kaumudi variety and under the pruning practice (Two primary branches + six secondary branches) (12.33 kg/plant) and (499.26 q/ha). The interaction effect of varieties and pruning practice also showed significant difference and has been depicted in Table 3, the maximum fruit yield (17.05 kg) per plant and fruit yield (682.74 q/ha) was observed in Kaumudi variety under the pruning practice (Two primary branches + six secondary branches). Patel *et al.*, (2017), stated that pinching causes photosynthates and endogenous hormones to be redirected towards the lateral branches, which in turn boosts fruit growth processes. Mardhiana *et al.*, (2017), observed that pruning eliminated unproductive sections, which led to a greater distribution of assimilates from photosynthesis, thereby promoting cell growth and also pruning regulates excessive vegetative growth, allowing for better sunlight exposure across the entire plant canopy, also improves air circulation and CO_2 levels, which boosts the rate of photosynthesis and as a result, leads to higher yields.

Table 4: Quality and physiological parameters.

Treatments	AC	CF	MP	LCC	RLWC
Factor 1: Varieties (V)					
V_1	57.33	84.11	23.76	26.78	6.19
V_2	54.78	82.89	19.09	63.69	6.88
V_3	47.00	78.33	24.54	46.44	5.08
S.Ed ±	0.91	1.15	0.47	0.92	0.11
CD(0.05)	1.93	2.43	1.01	1.94	0.23
Factor 2: Pruning practice (P)					
P_1	52.33	85.78	21.53	45.86	6.06
P_2	51.00	85.44	26.08	47.57	6.21
P_3	55.78	74.11	19.78	43.27	5.88
S.Ed ±	0.91	1.15	0.47	0.92	0.11
CD(0.05)	1.93	2.43	1.01	1.94	0.23
Interaction (V × P)					
V_1P_1	56.33	90.33	23.44	27.23	6.20
V_1P_2	55.00	85.67	27.44	27.77	6.37
V_1P_3	60.67	76.33	20.60	25.33	5.99
V_2P_1	54.33	85.67	18.06	64.03	6.90
V_2P_2	52.67	88.00	22.25	67.17	7.00
V_2P_3	57.33	75.00	17.09	59.87	6.73
V_3P_1	46.33	81.33	23.25	46.30	5.07
V_3P_2	45.33	82.67	28.72	47.80	5.27
V_3P_3	49.33	71.00	21.75	45.27	4.92
S.Ed ±	1.58	1.98	0.82	1.59	0.19
CD(0.05)	3.35	4.21	1.74	3.36	0.39

AC: Ascorbic acid content (mg/100g), CF: Crude fibre (%), MP: Moisture percentage (%), LCC: Leaf Chlorophyll content (spad) and RLWC: Relative Leaf Water Content (%).

(Here, V_1: CO-2, V_2 :Kaumudi ,V_3 : Green Snake, P_1 : Two primary branches + four secondary branches, P_2 : Two primary branches + six secondary branches, P_3 : No pruning, S.Ed : Standard Error of difference and CD : Critical Difference).

Quality and physiological parameters:

Ascorbic acid content (mg/100g) and Crude fibre

(%): The highest ascorbic acid (10.24 mg/100g) and crude fibre (0.56 %) was observed in Green Snake variety and under the pruning practice (Two primary branches + six secondary branches) (9.66 mg/100g) and (0.53 %). The interaction effect of varieties and pruning practice also showed significant difference and has been depicted in Table 4, the highest ascorbic acid (10.87 mg/100g) and crude fibre (0.61 %) was observed in Green Snake variety under the pruning practice (Two primary branches + six secondary branches). The increased ascorbic acid content observed with pruning treatments could be attributed to the enhanced morpho-physiological characteristics resulting from pruning and also an increase in crude fibre content due to the plant's response to reduced foliage and altered growth dynamics. Goda *et al.*, (2014), stated that pruning reduces vegetative growth, which improves light penetration and enhances photosynthesis efficiency, ultimately leading to an increase in ascorbic acid content.

Moisture percentage (%): The highest moisture percentage (94.63 %) was observed in Green Snake variety and under the pruning practice (Two primary branches + four secondary branches) (94.84 %). The interaction effect of varieties and pruning practice also showed significant difference and has been depicted in Table 4, the highest moisture percentage (95.03 %) was observed in Green Snake variety under the pruning practice (Two primary branches + four secondary branches). When excess foliage is pruned, the plant often experiences reduced transpiration rates, which means less water is lost through the leaves, this reduced water loss can result in higher moisture retention in the fruits. Additionally, pruning may improve light penetration and air circulation, which can enhance fruit development conditions (Premalatha *et al.*, 2006) and lead to more efficient water uptake and storage in the fruits.

Leaf Chlorophyll content (spad): The maximum chlorophyll content (55.34 spad) was observed in Kaumudi variety and under the pruning practice (Two primary branches + six secondary branches) (55.66 spad). The interaction effect of varieties and pruning practice also showed significant difference and has been depicted in Table 4, maximum chlorophyll content (57.40 spad) was observed in Kaumudi variety under the pruning practice (Two primary branches + six secondary branches). Preece and Read (2005), noted that pruning treatments positively influenced dry matter production, this improvement can be attributed to the pruning, which restricted vegetative growth, enhanced light penetration and boosted photosynthesis efficiency. The Pruning group exhibited higher chlorophyll content due to enhanced light penetration and reduced vegetative growth, which improved photosynthetic efficiency and led to greater chlorophyll production in the leaves.

Relative Leaf Water Content (%): The highest relative leaf water content (76.23 %) was observed in Green Snake variety and under the pruning practice (Two primary branches + four secondary branches) (79.43 %). The interaction effect of varieties and pruning practice also showed significant difference and has been depicted in Table 4, the highest relative leaf water content (80.58 %) was observed in Green Snake variety under the pruning practice (Two primary branches + four secondary branches). The relative leaf water content is a crucial indicator of a plant's water status. It helps maintain a balance between the rate of transpiration and water absorption in plants. Pruning increases light penetration within the canopy, which can lead to higher temperatures and potentially greater water loss from the plant canopy through evapotranspiration or other processes (Preece and Read, 2005). Relative leaf water content influences the economic yield (Ibrahim and Aldesuquy, 2003).

Conclusion

From the analysis of morphological, phenological, physiological, yield attributing and quality parameters it was observed that pruning practice had positive effects on the growth, flowering, yield and quality of Snake gourd. Among the growth, flowering and quality parameters Green Snake variety was found to be superior, but the yield and yield attributing parameters were observed to be best in Kaumudi variety. Under the different pruning practice, significant yield was obtained in P_2 (Two primary branches + six secondary branches) with good quality parameters which is preferable to market and fetches good market prices. The treatment V_2P_2 was found to give the highest B:C ratio. Therefore, based on the results obtained, it can be concluded that the P_2 pruning practice may be recommended to the farmers for increasing the production and productivity of Snake gourd.

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