CHAPTER V

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DISCUSSION

Studies on grape vine varieties namely Beauty Seedless and Perlette in relation to fruiting behaviour, fruitful buds topping, pinching Ethephon, CCC etc. treatments revealed useful results. Data and results obtained in the previous chapter are being discussed in the following lines.

All the treatments of Ethephon and CCC have shown the effective response where they decreased length of shoot in both varieties of grape vines namely Beauty Seedless and Perlette during 1983-84 and 1984-85 except in Beauty Seedless in second year of these investigations under Ethephon at 500 ppm treatments. In the present findings, it was also evident that CCC at 1000 ppm gave the minimum shoot length 0.925 and 2.045 M in Beauty Seedless and Perlette during 1983-84. Different treatments resulted in accordance with the findings of Alleweldt and Ilter (1969), Barnard (1938), Bindra et al. (1976), Burt (1964), Carpenter and Stuart (1961), Chandha and Kumar (1970), Coombe (1960), Eddy Szyjewicz and Kliewer (1966), Huglin and Julliard (1968) and Le-Roux and D.C. Ujs (1975).

Results of the present investigations along with the treatments of Ethephon and CCC have given effective response where it showed a decrease in diameter of shoot in both varieties of grapes, namely Beauty Seedless and Perlette during 1983-84 and 1984-85. It was also found that Ethephon
at 1500 ppm have the minimum shoot diameter 0.930 cm in Beauty Seedless variety during 1983-84 and CCC at 1500 ppm also gave the minimum shoot diameter 1.123 cm in Perlette during 1984-85. These treatments also gave the significant effect of their response in both varieties of grapes. These results are in accordance with the findings of Antcliff et al. (1958), Arumugam (1970), Chelam and Satyanarayan (1968), Coombe (1965), Coombe (1967), Das and Reddy (1972), El. Zeftawai and Weste (1970), Jackson (1970), Kobayashi and Okomota (1967), Kurai-shi and Muir (1983), Lavee (1973), Loreti and Natali (1974) and May (1966).

Treatments of Etaphon and CCC have revealed the effective and positive response where they decreased the length of internode in grape vines - Beauty Seedless and Perlette during 1983-84 and 1984-85 except in Perlette variety during second year of these investigations. It was also found that CCC at 1500 ppm gave the minimum internode length 3.775 in Beauty Seedless during 1983-84 and CCC at 1000 ppm which gave the minimum internode length in Perlette during 1984-85. Agaoglu (1971), Bindra et al. (1976), Charlotte (1979), Coombe (1965), Hawker et al. (1981), Khanduja et al. (1976). Lilou and Todorov (1981) also reported the similar results in internodal length of grape vines. However, the increase or decrease in vegetative growth has its effect on the production of nodes where grape bunches are found to be differentiated in the proper season if growth is restricted,
then length of branches may increase and because of this increase, there might be increase in number of buds.

All the treatments of Ethephon and CCC have shown their effective response where they decreased the number of laterals in both varieties of grapes i.e. Beauty Seedless and Perlette during the years 1983-84 and 1984-85. It was apparent that CCC at 1500 ppm and Ethephon at 1500 ppm gave the minimum number of laterals 0.975 and 0.925 in Beauty Seedless and Perlette during 1983-84 respectively. These results are in accordance with the findings of Buttrose (1968, 1970), Chadha and Kumar (1970), Cross and Webster (1936), Coombe (1965), Kliwer and Nassar (1966), Kondo (1950), Mohan et al. (1964), Nikiforova (1957), Rao (1968) and Winkler (1930).

In these investigations, treatments of Ethephon and CCC have shown the effective response where they induced an increase in number of buds in both the varieties of grapes i.e. Beauty Seedless and Perlette varieties during second year under 1000 ppm and 1500 ppm CCC concentration was also evident that Ethephon at 500, 1000, 1500 ppm and CCC at 500, 1000, 1500 ppm gave the maximum number of buds 0.475, 0.700, 0.625 and 0.550, 0.575, 0.500 in Beauty Seedless during 1983-84. Ethephon at 500, 1000, 1500 ppm and CCC at 500, 1000, 1500 ppm applications also gave the maximum number of buds 0.650, 0.700, 0.600 and 0.750, 0.600, 0.550 in Perlette during 1983-84. Results of the different varieties/strains in grapes are in accordance with the findings of Anticliff and Webster.
(1955), Antcliff and May (1961) and Baldwin (1965) in Sultana vine, Bindra (1976), Tuturnik (1962), Buttrose (1969) in other grape vines, Chitkara et al. (1977), Khanduja and Abbas (1973) in other grape varieties at Lucknow.

Results of all the treatments of Ethephon and CCC have shown an effective response and gave an increase in the fruitful shoots in both varieties of grapes—Beauty Seedless and Perlette during 1983-84 and 1984-85. It was also evident that Ethephon at 500, 1000, 1500 ppm and CCC at 500, 1000, 1500 ppm gave the maximum number of fruitful shoots in Beauty Seedless during 1983-84. In Perlette variety, Ethephon at 500, 1000, 1500 ppm and CCC at 500, 1000, 1500 ppm recorded the maximum number of fruitful shoots which were 0.450, 0.750, 0.750, and 0.700, 0.550, 0.450 during 1983-84. These results of the present investigations were similar to the findings of Chitkara et al. (1972), Rajaram et al. (1985), Nii (1979), Patil et al. (1982) in grapes, Picket and Rowart (1941) in the Muscadine grape, May and Kliewer (1973), Pratt (1974), Rao and Muthukrishnan (1969) in Indian grape, Musahib and Dinsa (1964), Srinivasan and Mullins (1979, 1981).

In the results of shoot length of grape vines, treatments of tipping have revealed the effective response and gave reduction in length of shoot in Beauty Seedless and Perlette during 1983-84 and 1984-85. It was evident that at fruit set it gave the minimum shoot length 0.962 and 2.355 M in Beauty Seedless and Perlette during 1983-84. Similar results have also been reported by the different research
workers at various stations. Prasad and Singh (1984), Rao et al. (1965), Rao (1968), Sidahmed and Kliewer (1980), Singh (1958), Singh (1959), Sugiura et al. (1975) and Sugiura (1976) expressed their views on the same lines in their results of their research projects. However, the shoot growth at certain length may be affected by several factors like soil, manures etc. but in identical situations the results should be similar at different places like the above results of shoot length, treatments of tipping have shown the effective response and decreased the shoot diameter in both varieties of grapes - Beauty Seedless and Perlette during 1983-84 and 1984-85. It was also found that in fruit set stage it gave the minimum shoot diameter 1.193 and 1.380 cm in Beauty Seedless and Perlette during 1983-84 and 1984-85, respectively. In other researches of Washer and Leopold (1967), Singh and Khanduja (1977), Sulikeri et al. (1971), Thomas and Barnard (1937), Weaver and Pool (1971), Weaver (1975) and Wittwer (1974) have also reported the similar results of their research investigations conducted in different varieties of grape vines.

Treatments of pinching have shown the effective response where it decreased the length of internode in both varieties of grapes Beauty Seedless and Perlette during 1983-84 and 1984-85. It was also evident that the treatment at fruit - set gave the minimum internodal length 4.988 and 7.988 cm in Beauty Seedless and Perlette during 1983-84 and
1984-85, respectively. These results were assessed in accordance with the findings of Bindra et al. (1976), Barnard (1938), Burt (1964), Charlotie (1979), Coombe (1959, 1960), Crane (1964), Das and Reddy (1972), Edgerton et al. (1969), Guhgare and Mukherjee (1968), Halfacre et al. (1968) and Khanduja et al. (1976) in Beauty Seedless vines. However, the internodal length can also be affected by other aspects if the situations are not the similar Singh (1959), Sulikeri et al. (1971), Sugiura et al. (1975).

All the treatments of pinching have shown the effective response which showed a decrease in the number of laterals in both the varieties grape Beauty Seedless and Perlette during 1983-84 and 1984-85. Beauty Seedless and Perlette in second year of these investigations also gave the similar response. It was also evident that pinching at Anthesis gave the minimum number of laterals 1.629 and the pinching at fruit set gave the minimum number of laterals 2.025 in Beauty Seedless and Perlette during 1983-84. Similarly, Khanduja et al. (1976), Kondo (1950), Lavee and Shulman (1971), Le-Roux and Uja (1975), Matiasvilli (1964), Matsui and Nakamura (1977), Mullins (1968), Naito and Hayashi (1976) and Niimi (1979) in grape vines also reported the results in the same lines.

Treatments of tipping/pinching have shown an effective response where they increased the fruitfulness of buds in both the varieties of grapes Beauty Seedless and Perlette during 1983-84 and 1984-85. It was also evident that tipping/pinching at 2 weeks before Anthesis, at Anthesis and at fruit set gave
the maximum number of buds 0.325, 0.675, 0.600 and 0.350, 0.675, 0.425 in Beauty Seedless and Perlette during 1983-84, respectively. Fruitfulness of the buds showed significant response to the different treatments of grape vines. These results are in accordance with the findings of Alexander and Woodham (1962), in Sultana buds, Bakhashi et al. (1970) in Thompson Seedless, Balasubrahmanyam (1971), Bhujbal and Phandis (1971), Buttrose (1974), Chitkara et al. (1977), Gibbs and Southbrick (1937), Khanduja and Balasubrahmanyam (1972), May and Antcliff (1973), Pandey and Bajpai (1969), Sen and Malik (1941), Skene and Hale (1971) and Tuft and Morrow (1925) also reported such findings in their researches.

Treatments of pinching showed an effective response where it increased the fruitful shoots in these varieties of grape Beauty Seedless and Perlette during 1983-84 and 1984-85. It was also evident that tipping at 2 weeks before Anthesis, at Anthesis and at fruit set gave the maximum number of fruitful shoots 0.313, 0.663, 0.650 and 0.238, 0.838, 0.475 in Beauty Seedless and Perlette during 1983-84, respectively. Balasubrahmanyam (1973), Chitkara et al. (1972) in Thompson Seedless grapes, Dobrev (1984), Olnoue (1940), Picket and Rowart (1941), Pratt (1974), Rao et al. (1966), Ziegler and Branscheidt (1927) also reported the similar findings under the investigations of the fruitful shoots in grape vines.

Ethephon and CCC applications have shown the effective response in grapes where decreased the length of shoot in both
varieties during 1983-84 and 1984-85, except in Perlette during first year of these investigations at 2000 ppm treatment of CCC. It was also evident that Ethephon at 2000 ppm and CCC at 1000, 1500 ppm gave the minimum shoot length 0.930, 2.048, 2.048 M in Beauty Seedless and Perlette during 1983-84, respectively. Aravindakshan (1963), Naito et al. (1974), Niimi (1979), Rao et al. (1965), Rao (1968), Sidahmed and Kliemer (1980), Singh (1958), Singh (1959), Sugiura et al. (1975), Sugiura (1976), Tazuka et al. (1961), Thomas and Barnard (1937), Weaver and Pool (1969), Wittwer and Tolbert (1960) also found the similar variations in their investigations conducted in different varieties of grape vines.

Treatments of Ethephon and CCC have shown an effective response where it decreased the shoot diameter in Beauty Seedless and Perlette during 1983-84 and 1984-85. It was found that Ethephon 2000 and CCC 1500 ppm gave the minimum shoot diameter of 0.930, 0.930 Cm. for Beauty Seedless in 1983-84, and Ethephon and CCC at 1500 ppm in Beauty Seedless gave the minimum diameter of 0.925 and 0.903 Cm during 1984-85. In case of Perlette Ethephon and CCC at 1000 ppm gave the minimum diameter of 1.438, 1.420 and 1.477, 1.468 Cm in 1983-84 and 1984-85 respectively. These results are in accordance with the findings of Bakhashi et al. (1970), Barnard (1938), Bhujbal (1974) in Angular Kalan grapes, Bradt (1962) in grape, Greulach and Haesloop (1954), Modlibowska (1965) in Pear, Naito et al. (1980), Phillips (1971) in Citrus, Pool (1982) in grape Winkler (1929) in grape vines.

Treatments of Ethephon and CCC revealed the effective response where this applications of both the chemicals on the
growth of internode in Beauty Seedless and Perlette varieties gave significant effects minimum internodal length of 4.988 and 5.000 Cm in Ethephon at 2000 ppm treatments was recorded in Beauty Seedless during 1983-84 and 1984-85, respectively. Similar trend was observed in the CCC application in Beauty Seedless variety. In Perlette variety, the minimum internodal length was recorded in 1500 ppm of Ethephon where as in CCC it was in 2000 ppm treatments Results of the different varieties strains in grape vines are in accordance with the findings of Agaoglu (1971), Arumugam (1970), Balasumrahmanyam and Khanduja (1977), Bhujbal (1974), Charlton (1979), Coombe (1960), Edgerton (1966), Guhgare and Mukherjee (1968), Jackson (1970) and Kuraishi and Muir (1983).

Productions of lateral branches in all the treatments of Ethephon and CCC was found effective. In fact the treatment decreased the number of lateras in both varieties of grapes Beauty Seedless and Perlette during 1983-84 and 1984-85 except in Beauty Seedless during first year of these investigations under 500 ppm treatments of Ethephon and CCC. It was also found that Ethephon and CCC at 2000 ppm gave the minimum number of laterals 1.6000 and 2.518 in Beauty Seedless and Perlette, during 1983-84, respectively. Results of the different varieties/strains in grape vines are in accordance with the findings of Arumugam (1970), Bindra (1976), Coombe (1965), Greulach and Haesloop (1954), Matsui and Nakamura (1978). Naito et al. (1980), Phillips (1971), Pool (1982), Talbert (1960), Winkler (1929) in grapes.
In the results of fruitfulness of buds, all the treatments of Ethephon and CCC have given the effective response and increased the fruitfulness of buds in both varieties of grape during 1983-84 and 1984-85. It was found that Ethephon at 500, 1000, 1500, 2000 ppm and CCC at 500, 1000, 1500, 2000 ppm gave the maximum fruitfulness of buds which was 0.475, 0.688, 0.563, 0.513, 0.625, 0.500, 0.350 in Beauty Seedless during the years 1983-84. In Perlette variety (1983-84) Ethephon at 500, 1000, 1500, 2000 ppm and CCC at 500, 1000, 1500, 2000 ppm gave the maximum increased in fruitfulness of buds which was 0.625, 0.763, 0.613, 0.500, 0.663, 0.700, 0.525, 0.488 in these treatments. Similar findings have also been found by Ahlawat (1981) in Kishmish Charani grapes, Ahmad and Khan (1951), Allweleldt (1964), Antcliff and May (1961) in Sultana vines, Balasubrahmanyan (1971), Baldwin (1966), Barnard (1932), Bhujbal and Phadnis (1971), Bindra et al. (1960), Buttrose (1970), Khanduja (1965), Khanduja and Balasubrahmanyan (1968), in Gulabi variety of grapes, Musahib (1946), in mangoes, Rajaram et al. (1964) and Sen and Malik (1941) in mango have also reported the similar results.

In the results of fruitful shoots, treatments of Ethephon and CCC have shown the effective response where it has positive response to fruitful shoots in both varieties of grapes Beauty Seedless and Perlette during 1983-84 and 1984-85. It was also evident that Ethephon and CCC at 500, 1000, 1500, 2000, ppm gave the maximum response to fruitful shoots which was 0.450, 0.688, 0.500, 0.453 and 0.489, 0.625, 0.475, 0.400 in Beauty Seedless during 1983-84. In Perlette, the Ethephon and CCC at 500, 1000,
1500, 2000 ppm gave the maximum response to fruitful shoots which were 0.600, 0.750, 0.613, 0.535, and 0.638, 0.725, 0.500, 0.488 during the years 1983-84 respectively. Such variations were also reported by Chitkara et al. (1972), Coombe (1965), Olnoue (1940), Patil et al. (1982), Picket and Rowart (1941), Prasad (1969), Pratt (1974), Rao et al. (1966), Rodrigues and Ryan (1960), Sachs (1961) and Shulman et al. (1982).

Studies on chlorophyll content in leaves revealed that treatments of topping and after harvest, Ethephon and CCC applications gave effective response. All the treatments in Beauty Seedless and Perlette varieties were effective and positive during both the years. The maximum content chlorophyll was recorded 1.303 in Beauty Seedless during 1983-84 whereas it was 1.342 in Perlette under Ethephon 1500 ppm treatments during 1984-85.

Regarding the effect of Ethephon and CCC treatments after harvest, the leaves of grape variety gave the increasing trend in the chlorophyll content in all the treatments during 1983-84 and 1984-85, respectively. CCC applications also increased the chlorophyll content in the leaves which was proved in increasing trend in Beauty Seedless and Perlette during both years. There was a considerable increase in Beauty Seedless variety than Perlette during 1983-84 and 1984-85. These results are in accordance with the findings of El-Zeftawi and Weste (1970), Halfacre et al. (1969), Kriedmann et al. (1970), Le-Roux and Malan (1945), Matsui and Nakamura (1977), Matsui and Nakamura (1978), Sulikeri et al. (1970) and Weaver and Mecune (1960).

It has been found that carbohydrate and nitrogen content ratio in shoots and canes has a significant role with the season
and particularly in months. Results of present investigations also revealed that there was its increasing trend from the month of April to May during both the years in shoots but in canes it gave a reducing trend where it was ranging from 29.82 to 12.13, 32.99 to 10.78, 16.28 to 5.20 and 32.86 to 10.79 in all the canes during 1983-84 and 1984-85. These results are in accordance with the findings of Antcliff (1967), Amerine and Winkler (1958), Bindra et al. (1980), Dawler and King (1966), Dowton et al. (1973), Edgerton and Blanpied (1968), Hulmani et al. (1971), Khajuria et al. (1970), Kraybill et al. (1930), Nethery and Washburn (1971), Olmous (1935), Pratt and Goeschel (1969), Matsui et al. (1979), Purohit et al. (1979), and Sachs and Hackette (1972). However it has also reported a positive response of girdling to carbohydrate content and development of Thomas Seedless, Red Malaga and Ribier grapes (Weaver and McCune, 1959). Not only this a metabolism of organic acids and carbohydrates gave also been observed in vinifera (Kliewer and Schultz, 1964).

In present findings of carbohydrate and nitrogen content ratio in shoot of grape vines resulted the maximum content in the month of December but after wards it indicated a reducing trend of its ratio during 1983-84 and 1984-85. Similarly the chemical changes of certain chemicals contents in grape vines have also been reported by Antcliff (1967), Sachs and Heckete (1972), Schrader (1924), Singh and Dhuria (1960), Szyjewicz and Kliemer (1983), Weaver et al. (1966), Wicks Alan and Kliewer (1983) and Winkler and William (1945). However, a seasonal variation in minerals and hormone's role in different aspects and even fruit set have also reported where beneficial results on different
aspects were discussed (Crane, 1969, Bindra et al., 1979).

It has also been found that discussions on the different objectives along with the retrospective reports have given the useful findings for information and further line of work after needbase studies.