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PRUNING PRACTICES TO ENHANCE VEGETATIVE GROWTH AND REDUCING MALFORMANTION OF INFLORESCENCE IN MANGO

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Abstract

Panicle pruning practices were carried out from March to May 2003 with fifteen days interval and considered that this will result early emergence of lateral shoots in same season and these shoots were supposed to bear normal panicles in the next blooming season. Significant affects of pruning practices were recorded in the form of early emergence of lateral shoots and reduction in malformation of inflorescence was recorded. Significant number of lateral shoots sprouted on terminals from where fruit bearing panicle were pruned followed by terminals from where naturally fruit barren and malformed panicle were pruned respectively. Lateral shoots of April and shoots emerged on third week of March pruned terminals bloomed, heavily. Pruning practice in Mid March and first week of April resulted as optimum blooming and reduction in malformation of inflorescence on lateral emerged sooots. Carryover effect of malformation was more on malformed panicle pruned terminals followed by naturally barren and healthy panicle pruned terminals respectively.

Key words: Flushes, cv. Chuansa, bearing panicles, barren panicles.

INTRODUCTION

Pakistan is bestowed with good agro-climatic conditions needed for successful production of mango. It is a second largest commercial fruit of the country after citrus and is cultivated over an area of 100, thousand hectares, contributing about 14.94% of the total fruit area (658.3 thousand tonnes) of the country (Anonymous, 2005). There is however, still a great potential to increase per hectare yield because our soils and climatic conditions are quite suitable to produce high yield and good quality mango if proper management is practiced. Our mango industry is facing numerous problems like low fruit set, high fruit drop and intricate physiological disorders like of irregular bearing and malformation of inflorescence. Although exhaustive research on malformation of inflorescence has been conducted on pathological, entomological and physiological aspects but no claim so far could gain popularity because of being ineffective to control the malady. The picture is still confusing and a general consensus on the precise causal mechanism has yet to be reached. The studies encompass the cultural approaches based on observations i.e. prolonged hanging of barren panicles on shoots delayed the emergence of lateral

shoots and late emerged shoots increased percentage of malformed panicles in the next blooming season (Tahir et al. 1999) Therefore, the present studies were designed to minimize the malady through pruning of malformed, fruit bearing and naturally barren panicles to induce prompt healthy vegetative growth and to see if these shoots could bear healthy panicles during the subsequent year.

MATERIALS AND METHOD

Experimental approaches were carried out in Experimental Fruit Orchard (Square 9), Institute of Horticultural Sciences, University of Agriculture Faisalabad during the year 2003-2004.Pruning practices were carried out to initiate early vegetative growth and to see its effect on blooming in next season. Six panicles were randomly selected by moving around the tree from shoulder height in each term of pruning practices. At each date of pruning, panicles were lightly beaten with lead pencil and terminals from where fruit dropped, were pruned and tagged as naturally barren panicles were pruned two nodes below their base along with a portion of terminal with a sharp knife. Schedule of panicle pruning during the year 2003 was as under.

(Units: Pruning Dates)

Treatments	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Pruning dates of malformed panicles terminals	Control	1st March	15th March	1st April	15th Apil	1st May	15th May
Pruning dates of terminals of Healthy (fruit bearing panicles)	Control	1st March	15th March	1st April	15th Apil	1st May	15th May
Pruning dates of terminals of barren panicles	Control	1st March	15th March	1st April	15th Apil	1st May	15th May

RESULTS AND DISCUSSION

Data about vegetative and reproductive growth pattern was recorded and tabulated in to describe effects of pruning.

Emergence of shoots in April 2003

Emergence of shoots in April on pruned terminals was recorded. Maximum number of April shoots (3.75) emerged on terminals pruned on 15th March (T_3) followed 3.39 & 1.51 on first week of March (T_2) and first April (T_4), respectively and non-significant response of control terminals recorded (Table 1). In connection with type of panicle, Maximum number of shoots (2.80) induced on healthy panicle pruned terminals followed by barren panicle pruned terminals and malformed panicle pruned terminals, respectively, as shown in Table 1. Regarding the interaction, Maximum number of shoots (5.78) emerged on terminals of healthy panicles, pruned on first (week) of March followed by terminals of barren panicles (natural drop) pruned on 15th of March which is at par with pruning of panicles on first week of March.

From above results it was cleared that panicle-pruning practices should be carried out before exhaustion of terminals in order to have good healthy vegetative growth for good blooming potential in next blooming season. Our finding was correlated with the results of Ali and Malik (1980). They showed that deblossoming carried out early during the flowering season (bud burst stage) was helpful to have early flushing and to reduce the incidence of malformation of inflorescence.

Emergence of shoots in May 2003

Maximum number of shoots (3.72) emerged on terminals pruned on15th of March (T_3) which is at par with pruning on first of March (T_2) while minimum number of shoots emerged on non-pruned terminals (control) as shown in Table 2. Healthy panicle pruned terminal scored more number of shoots followed by barren and malformed panicle pruned terminals. Maximum number of shoots (5.35) emerged on healthy panicles, pruned on 15th of March followed by barren panicles, pruned in first of March which is at par with barren panicles, pruned on 15th of March.

From above results it is clear that more emergences of shoots on healthy panicle pruned terminals might be due to a reason that these terminals not be exhausted more than malformed and barren panicle pruned terminals.

Emergence of shoots in June 2003

Maximum number of shoots (6.31) bored on terminals pruned on 15th of May followed by 4.25 and 3.65 on terminals pruned in first of March and April as shown in Table 3, respectively. More number of shoots (3.85) emerged on healthy panicle pruned terminals followed by naturally barren and malformed panicle pruned terminals. In interaction, maximum (9.47) shoots emerged on terminals from where naturally barren panicles were pruned on 15th of May which is at par with healthy panicles, pruned in the same date.

Blooming of previous year tagged shoots

Significant blooming percentage was recorded on shoots of pruned terminals as compared to control i.e. non-pruning terminals. Maximum blooming of 56.67 was recorded on shoots of terminals pruned on 15th of March followed by 54.67 and 48.33 on terminals pruned in first of April and March respectively as shown in Table 4. There was maximum blooming (49) on malformed panicle pruned terminal followed by barren (37.42) and (33) healthy panicle pruned terminals (Table 4).

Intensity of malformation

There were more number of malformed panicles emerged on control terminals as compared to panicle pruned terminals as shown in Figure 1. Time of pruning is very important in controlling carryover effect of malformation of inflorescence. Late and very early pruning of malformed, fruit bearing (healthy) and naturally barren panicles resulted in more malformation.Carryover effect of malformation was reduced on lateral shoots of terminals from where panicles were pruned on 15th of March followed by pruning done in first and 15th of April, respectively, as shown in Figure 1. Carryover effect of malformation was at par on lateral shoots of terminals from where malformed, fruit bearing (healthy) and barren panicles were pruned in first weeks of March & May. From above results, it is clear that early pruning of panicles is required to have early emergence of lateral shoots and for the reduction of malformation of inflorescence.

CONCLUSION

Panicle pruning is required for both juvenile and reproductive growth of mango. Mid March and whole month of April is the critical time of pruning in mango cv. Chaunsa regarding the emergence of lateral shoots, blooming potential and reduction of malformation of inflorescence.

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Table 1: Emergence of shoots in April 2003

(Unit: Average number of shoots emerged per terminal)

	T_1	T_2	T_3	T_4	Means
Malformed panicles	0.16	0.415	3.25	1.83	1.41
Healthy panicles	1.05	5.78	3.50	0	2.58
Barren panicles	0	4	4.50	2.72	2.80
Means	0.40	3.39	3.75	1.51	2.26

Table 2: Emergence of shoots in May 2003

(Unit: Average number of shoots emerged)

	T_1	T_2	T_3	T_4	T_5	T_6	Means
Malformed panicles	0.33	0.88	1.31	1.73	3.02	3.53	1.80
Healthy panicles	0	4.33	5.35	2.7	1.99	0	2.39
Barren panicles	1.40	4.5	4.5	2.95	1.99	0	2.22
Means	0.57	3.23	3.72	2.46	1.67	1.17	

Table 3: Emergence of shoots in June 2003

(Unit: Average number of shoots emerged)

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Means
Malformed panicles	0	1.26	2.81	5.23	4.02	1.44	0.98	2.20
Healthy panicles	0	6.50	4.35	3.20	3.44	1.00	18.49	2.64
Barren panicles	2.27	5.00	3.00	1.45	3.50	0.95	19.47	2.78
Means	0.75	4.25	3.38	3.29	3.65	1.13	6.49	

Table 4: Blooming potential of previous year tagged shoots

(Unit: Percentage of blooms per terminal)

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Means
April	28	32	70	70	41	27	30	42.57
May	19	30	50	42	35	35	39	35.71
June	20	30	50	32	35	35	30	33.14
Means	22.33	30.66	56.66	48	37	32.33	33	

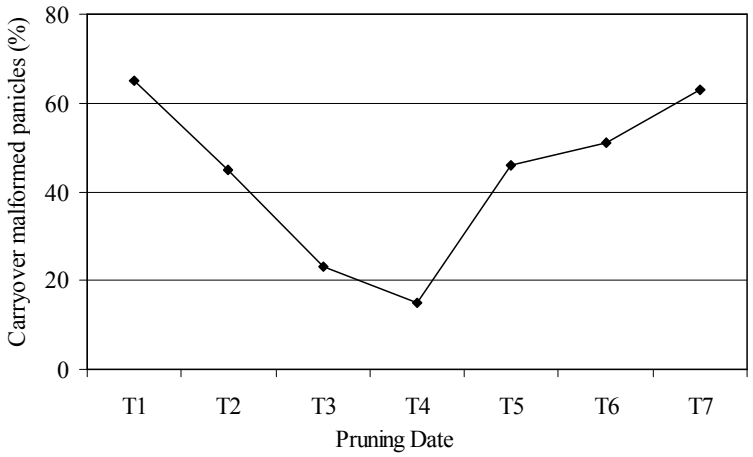

Figure 1: Carryover effect of malformation of inflorescence