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Influence of Double Pruning in a Year and Fertilizer Application Time on Growth and flowering Behaviour of Phalsa (*Grewia asiatica* L.) cv. Local

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A B S T R A C T

The present investigation entitled Influence of double pruning in a year and fertilizer application time on growth and flowering behaviour of phalsa (*grewia asiatica* L.) cv. Local was carried out in the year 2019 at horticultural research farm, Anand Agricultural University, Anand. The experiment was carried out with ten treatment combinations of two factors i.e. Five levels of different sets of double pruning and two levels of fertilizer applications time in CRD (Factorial) design. Study showed results that treatment P_1i.e.double pruning during August and January was found significant with maximum length of shoot at harvest (94.37cm) and minimum days taken to flowering (42.75), while treatment P_5 i.e. double pruning during December and May found significant with minimum days to sprouting new shoot (6.81). Growth parameter such as number of sprouted shoot per cane showed non-significant effect. Fertilizer application time was found no significant effect for all parameters.

Introduction

Phalsa (*Grewia asiatica* L.) belongs to order malvales and family Tiliaceae which includes 18 genera and 350 species. Phalsa is commercially propagated by seed. The fruits eaten fresh as desert are made into syrup and extensively employed in the manufacture of soft drinks. (Singh and Singh, 2017). Ripe fruits contain 50-60 per cent juice and 2.0-2.5 percent acid and good source of Vitamin A and C (Aykroyd, 1963) with following nutritive values: Energy, 90.5Kcal; Protein, 1.58g; Fat, >0.1g; Crude fiber, 5.53g; Carbohydrates, 21.1g; Mineral content, 0.55g(parameters analyzed/100gm). (Rehman *et al.*, 2013)

Pruning is very vital for phalsa crop that promotes fruiting of trees; it evenly and balanced emerging of the shoots on bushes with distinct flowering. Wrong pruning can weaken the structure of a tree and it affect its natural growth and cause wounds that do not heal properly. (Singh and Sharma, 1961). Jadhav (1993) carried out the experiment of double cropping system in phalsa. They have tried winter as

first off season crop and second regular crop in summer on the same bushes along with traditional single crop. He reported that by two times pruning i.e. August and January in a year resulted to increase in productivity also suggested that only winter season crop was not found economical, however, the total of double cropping system was found desirable. On the basis of them research, two crops in year from one plant is possible and need to take research with different months combination for identify suitable period and time for double crops with their effect on growth and flowering parameters of phalsa crops.

Materials and Methods

The experiment was carried out in the year 2019 on seven years old phalsa plants of variety 'Local' planted at Horticultural Research Farm, Anand Agricultural University, Anand. All the plants selected were uniform in growth and planted at the distance of3 ×3 meters. The climate of Anand region is semi-arid and sub-tropical type. Winter is mild cool and dry, while summer is hot and dry.

The experiment was laid out in a Completely Randomized Design (Factorial) with ten treatment combinations of two factor. 1) Double Pruning time (P_1= August and January, P_2= September and February, P_3= October and March, P_4= November and April, P_5= December and May) on the same plant 2) Fertilizer application (F_1= Single split of RDF at time of 1st pruning and F_2= double split of (50% + 50%) RDF at the time of 1st and 2nd pruning) replicated for four times. Pruning carried out at first week of particular month at 1m height from ground level.

Results and Discussion

Effect of double pruning

The data presented in table-1 indicate that during the 1stpruning of August to December, significantly earlier sprouting was recorded during the month of August (6.75), similarly during 2nd pruning of January to May, earlier sprouting of new shoot was observed under the month of May (6.00). While, on the basis of mean of both pruning, significantly earlier of sprouting new shoot was recorded under the treatment P_5 i.e. December and May (6.81).

From the data clearly understand that earlier sprouting is directly related with high temperature and during both pruning high temperature were recorded in month of August and May. Andthis result is accordance with Shinde *et al.*, (1976); Kumar and Saravanan (2017) and Lakra *et al.*, (2018) in phalsa crop.

With the statistical data of growth parameters like no. of sprouted shoot/cane was found non-significant with 1st pruning, 2nd pruning and as well as for double pruning i.e. mean.

Data recorded for the maximum length of shoot at harvest during the 1st pruning of August to December, and it was found significant with the month of August (95.00), similarly, with the 2nd pruning of January to May, maximum length of shoot at harvest was found during the month of May (109.00cm). While on the basis of mean data of both pruning, maximum length of shoot at harvest was found with the treatment P_1 (August and January) i.e.94.37cm. It can be concluded that, the plant pruned during winter season, their growth and development is reduced due to low temperature while during the summer season ideal climatic condition favour for more growth and length of shoot. This finding accordance with Rao and Reddy (1989) and Dhander and Reddy (1984) as conducted experiment in phalsa crop.

In the flowering parameter, data shows that during the 1st pruning of August to December, minimum days taken to flowering was recorded with the month of December (44.00) and during the 2nd pruning of January to May, minimum days taken to flowering was found with the month of January (39.12). While, under the mean i.e. both pruning, significantly data was recoded with the treatment P_1 (August and January) i.e. 42.75.

Table.1 Effect of double pruning and fertilizer application time on growth and flowering parameters of phalsa crop

Treatment	Days to sprouting new shoot			No. of sprouted shoot/cane			Length of shoot at harvest			Days taken to flowering		
	1st Pruning	2nd Pruning	Mean	1st Pruning	2nd Pruning	Mean	1st Pruning	2nd Pruning	Mean	1st Pruning	2nd Pruning	Mean
Double Pruning												
P_1 (Aug & Jan)	6.75	7.12	6.93	8.62	8.87	8.75	95.00	93.75	94.37	46.37	39.12	42.75
P_2 (Sept & Feb)	7.75	7.25	7.50	8.75	9.37	9.06	94.12	89.00	91.56	47.12	43.50	45.31
P_3 (Oct. & March)	8.12	8.00	8.06	8.87	9.37	9.12	82.62	82.00	82.31	47.37	45.75	46.56
P_4 (Nov & April)	8.50	7.00	7.75	9.37	8.37	8.87	61.00	94.00	77.50	48.50	47.62	48.06
P_5 (Dec & May)	7.62	6.00	6.81	10.37	10.37	10.37	64.25	109.00	86.62	44.00	48.37	46.18
S.Em ±	0.25	0.25	0.17	0.73	0.54	0.45	3.31	4.08	2.63	0.36	0.33	0.24
$Lsd_{0.05}$	0.73	0.72	0.50	NS	NS	NS	9.58	11.80	4.44	1.06	0.96	0.70
Time of Fertilizer application												
F_1(Single split)	7.60	7.25	7.42	9.70	9.67	9.70	86.85	90.00	88.42	46.60	45.30	45.95
F_2(Double split)	7.90	6.90	7.40	8.85	8.80	8.85	71.95	97.10	84.52	46.75	44.45	45.60
S.Em ±	0.16	0.15	0.11	0.34	0.28	0.34	2.09	2.58	1.66	0.23	0.21	0.15
$Lsd_{0.05}$	NS	NS	NS	NS	0.81	NS	6.06	NS	NS	NS	0.61	NS

Fig.1

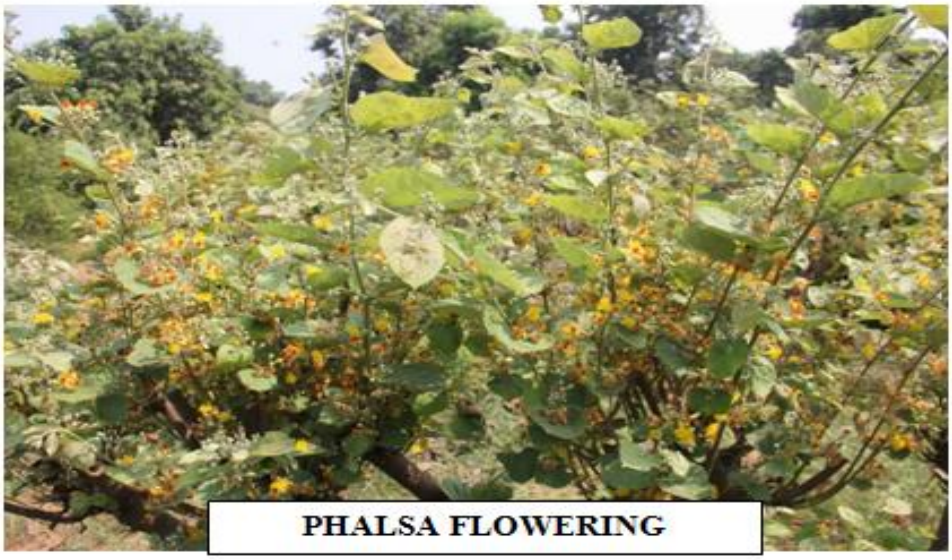

Fig.2

With the reference data, clearly understand that pruning during December and January recorded minimum days taken to flowering than other months. This finding is accordance with the results reported by Aziz *et al.*, (2018) in phalsa and Pawan *et al.*, (2017) in mulberry crop.

Fertilizer application

With respect to fertilizer application time in all four parameters i.e. days to sprout new shoot, no. of sprouted shoot/cane, length of shoot at harvest and days taken to flowering, effects were found non-

significant in 1st and 2nd pruning as well as in mean of it. It's indicate that application of fertilizer either in single split or in double split were not making any change in days to sprout new shoot, no. of sprouted shoot/cane, length of shoot at harvest and days taken to flowering parameters.

However, numerically higher value for two parameters like no. of sprouted shoot/cane and length of shoot at harvest i.e. 9.67 and 86.85cm, respectively, were observed under single dose application of fertilizer and this might be due to single application of fertilizer providing sufficient nutrient to the 1st pruning as compared to the 2nd pruning. This finding is in consonance with the result of Kandolia *et al.,* (1996) and Sharma *et al.*, (2003) in phalsa. While, under the days taken to flowering i.e. 44.45, lower value was recorded in split application of two dose of fertilizer.

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