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Short Note

Protection of litchi nursery plants against frost

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Litchi is an important fruit of our country grown successfully in Bihar, West Bengal, Uttranchal, Orissa, Punjab and Haryana. In Himachal Pradesh also, it is becoming a favourite fruit with the orchardists of the lower hills and valley areas. It is being grown mainly in district Kangra besides some pockets of Sirmour, Solan, Bilaspur, Chamba, Mandi, Hamirpur and Una. At present area under the crop is 3959 ha while the production stands at 3702 MT in the state. Since area under the crop is increasing every year, emphasis is being given to the production of litchi plants on scientific lines to meet out the demand of the orchardists within and outside the state. Litchi plants are usually affected adversely by the winter frost in our litchi growing areas. Generally, the nurserymen use hay, grass, twigs of fruit/forest plants or hessian cloth etc. to protect these young plants against frost. However, losses are heavy every year. About 50 per cent of the nursery plants die annually if not properly protected, and about half of the remaining plants get damaged badly. Since no work has been reported in this aspect, studies were undertaken to evaluate different types of material to protect the litchi nursery plants against frost.

The present studies were carried out during the year 2004-05 and 2005-06 on litchi nursery plants of Dehradun cultivar at Litchi and Mango Research Station, Nagrota Bagwan, Distt. Kangra, H.P. Well rooted layers were detached from the mother plants during the month of August and planted in the nursery beds keeping the recommended distance of 15cm within plants and 25 cm within rows (Anonymous, 2003; Sud, 2005). Nursery beds were covered during the second week of October with twigs of fruit/forest trees, grass, hessian cloth, shade nets having 75% and 50% shade or kept uncovered under control. In all, there were six treatments each comprising of 500 plants in a bed, replicated thrice under RBD. The covering material was removed after four months during the last week of February. Data pertaining to plant mortality, damaged plants, plant height and girth were recorded during the month of March.

Data pertaining to the influence of different covering material used for protection of litchi nursery plants on the percentage of mortality, damaged plants, height and girth are presented in table 1.

Table 1. Protection of litchi nursery plants against frost

I: Year 2004-05 II: Year 2005-06

Protection material	Mortality (%)			Damaged plants (%)			Plant height (cm)			Plant girth (cm)		
	I	II	Mean	I	II	Mean	I	II	Mean	I	II	Mean
Shade net (50%)	8.7	7.5	8.1	5.3	4.8	5.1	54.1	59.0	56.6	1.03	1.04	1.04
Shade net (75%)	9.8	8.6	9.2	6.8	6.2	6.5	52.8	56.8	54.8	1.01	1.02	1.02
Hessian cloth	20.2	17.5	18.9	13.2	16.4	14.8	46.8	49.2	48.0	1.00	0.98	0.99
Grass	26.6	27.2	26.9	21.3	24.4	22.9	42.4	45.7	44.1	0.98	0.96	0.97
Twigs of fruit/forest plants	30.1	32.4	31.3	26.2	30.2	28.2	40.8	42.9	41.9	0.97	0.94	0.96
Control	52.1	55.0	53.6	41.5	45.1	43.3	38.4	40.0	39.2	0.93	0.92	0.93
CD (P=0.05)	3.9	4.2	-	1.9	4.0	-	2.1	3.8	-	0.04	0.03	-

Plant mortality: More than half of the number of litchi plants (53.6%) died due to the winter frost

***Plant mortality*:** More than half of the number of litchi plants (53.6%) died due to the winter frost when left uncovered. Different materials used traditionally for protection like twigs of fruit/forest trees, grass and hessian cloth could reduce the mortality considerably but the best results (8.1%) were obtained when shade nets (50%) were used, though the results were at par with those of shade nets (75%). The observations were recorded to be similar during the two years of study.

***Damaged plants*:** Besides mortality, a large number of the remaining plants (43.3%) were found to be damaged. The situation improved considerably when twigs of fruit/forest trees, grass or hessian cloth was used as a protection material. However, shade nets were most effective in reducing the loss. Though the best results (5.1%) were noticed with shade net (50%) followed closely by shade net (75%) during the two years study.

***Plant height*:** Plant height was found to be maximum (39.2 cm) under control, which improved with the application of different protection materials. It was noticed to be maximum (56.6 cm) under shade net (50%) followed very closely with shade net (75%) during the study period.

***Plant girth*:** As in case of plant height, girth of litchi nursery plants was influenced considerably with the use of different protection materials. It worked out to be maximum (1.04 cm) when shade net (50%) was used, followed closely by shade net (75%). Minimum girth was recorded under control, when the plants were kept uncovered during the two years of observations.

The study revealed that shade nets were most effective in protecting the litchi nursery plants against winter frost in comparison to other materials like hessian cloth, grass or twigs of fruit/forest trees generally used by the nurserymen. The percentage of mortality as well as damaged plants was minimum, while the growth in terms of plant height and girth was maximum when shade net (50%) was tried. Hence, the litchi nursery plants should be covered with shade net (50%) from second week of October to last week of February when the chances of frost to occur are high.

References

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