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# Effect of season of flushing on flowering shoots in litchi (*Litchi chinensis* Sonn.)

**Shweta Kumari, Ruby Rani, JC Chandola and Ankita Aman**

**Abstract**
The age of the vegetative flush, or the degree of dormancy, appears to have a strong influence on the subsequent shoot development of litchi. A dormant period of several months prior to the flowering period appears essential for the production of good panicle, whereas vegetative flushing just prior to floral induction results in poor or no initiation and often vegetative shoots. An experiment was conducted at BAU, Sabour during 216-17 to study the effect of season of flushing on the percent of shoots that flowered with respect to four commercial cultivars *viz*; Deshi, Purbi, Bedana and Kasba. A perusal study of data on season of flushing and percent shoots flowered revealed that mid season flush produced the maximum percent shoots that flowered as compared to early season of flushing, while percent shoots that flowered was almost nil in case of late season of flushing. The early season of flushing resulted into 42% shoots flowered in case of Purbi followed by Deshi i.e., 39.2%. Among the four cultivars mid season flush of Deshi had the highest percentage of shoots that flowered i.e. 78% followed by Purbi (71%), while the lowest was found in cv. Bedana (32%).

**Keywords:** Litchi, flowering shoots, flushing season, cultivars, vegetative growth

## Introduction
The litchi (*Litchi chinensis* Sonn.) is the most renowned fruit of soapberry family, sapindaceae. Litchi, one of the most environmentally sensitive subtropical fruit crop, is adapted to areas of the world characterized by warm subtropics. India is the second largest producer of litchi accounting for about one-fifth of the global production and has a good export potential. The national average productivity of litchi is 6.1 t/ha, which is much lower than the realizable yield of the crop under well managed condition. It is highly specific to climatic requirements and probably due to this reason its cultivation is restricted to few countries in the world. In litchi growing areas in India the temperature varies from 21 ºC to 37.8 ºC during flowering and fruiting. Vegetative growth is normally restricted by temperature below 10 ºC and above 35 ºC with maximum growth between 25-30 ºC depending on cultivars (Menzel *et al*., 1989) [2]. It is however, sensitive to cold and the crop is severely injured by temperatures below freezing but can withstand light frosts. Relatively high rainfall of 1,200 mm per annum with high humidity is preferable (Tindall, 1994) [8]. A certain degree of water stress is needed for flower initiation. A dry climate, free from rains for about two months before flowering induce flower bud differentiation, blossom and consequently give high production. In general litchi plants produce three flushes after fruit harvest till panicle emergence. The new flush remains in a non-flushing condition for a length of time dependent largely upon environmental conditions (Nakata, 1955, Menzel and Simpson, 1988) [5, 3]. The age of the vegetative flush, or the degree of dormancy, appears to have a strong influence on the subsequent shoot development of litchi. A dormant period of several months prior to the flowering period appears essential for the production of good panicle, whereas vegetative flushing just prior to floral induction results in poor or no initiation (Nakata, 1955) [5] and often vegetative shoots (Lynch, 1958) [1]. Mustard and Lynch, 1959 previously observed a high proportion of non-emergent buds in flushes of intermediate maturity. They found that flushes maturing earliest before the winter period tended to produce a high proportion of floral shoots, while trees maturing quite late in the season produced a high proportion of vegetative shoots. Flushes that matured approximately 2 months before winter (midway between the above flushes) however, produced a high proportion of dormant buds. This may represent a similar situation to the controlled temperature trial in the present investigation, although no stunted panicles were recorded. Rai *et al*., 2001 [6] had reported that trees produce three flushes between fruit harvest to panicle emergence in the next year litchi.

## Material and Methods

An investigation was carried out at the Horticultural Garden, Bihar Agricultural College, Sabour during the year 2016-2017 with a view to study the effect of season of flushing on flowering shoots of litchi with respect to four commercial cultivars viz; Deshi, Purbi, Bedana and Kasba. Newly emerged flushes during July, October and December were tagged by regular visit of the orchard and the percentage of flowering shoots emerged from these flushes were recorded.

## Result and Discussions

The data with respect to time of flushing and extent of emergence of flowering shoots from the shoots emerged at different time has been depicted in Table. A perusal study of data on season of flushing and percent shoots flowered revealed that mid season flush produced the maximum percent shoots that flowered as compared to early season of flushing, while percent shoots that flowered was almost nil in case of late season of flushing. The early season of flushing resulted into 42% shoots flowered in case of Purbi followed by Deshi i.e., 39.2%. Among the four cultivars mid season flush of Deshi had the highest percentage of shoots that flowered i.e. 78% followed by Purbi (71%), while the lowest was found in cv. Bedana (32%). The finding of Mustard and Lynch, 1959 [4] is also in the same tune who reported that about 76% of the September terminal produced panicles in the following spring flushes, compared with only 42% and 36% the October and November flushes, respectively. Earlier Shukla and Bajpai, 1974 [7] also pointed out that vegetative flushing in the last week of November hardly produced any panicle in March, apparently due to immaturity of these shoots to differentiate flower buds in the month of December and January.

**Table 1:** Effect of season of flushing and per cent shoots flowered in litchi.

| Cultivars | Season of flushing | Per cent shoots flowered |
|---|---|---|
| Deshi | Early | 39.2 |
| | Mid | 78.00 |
| | Late | 00.00 |
| Purbi | Early | 42.00 |
| | Mid | 71.00 |
| | Late | 00.00 |
| Bedana | Early | 21.00 |
| | Mid | 32.00 |
| | Late | 00.00 |
| Kasba | Early | 28.00 |
| | Mid | 54.00 |
| | Late | 00.00 |

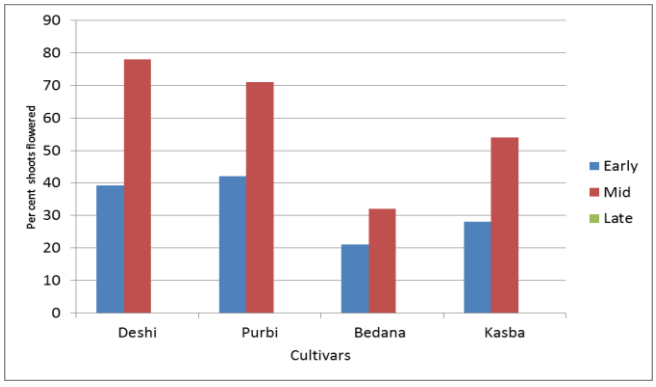


**Fig 1:** Effect of season of flushing and per cent shoots flowered in litchi

## Conclusion

Flushes emerged during mid-season had maximum percentage of shoots that flowered. Among the four cultivars mid season flush of Deshi had the highest percentage of shoots i.e., 78 per cent that flowered. But in case of Bedana, early as well as mid season flush the per cent of flowering shoots was less i.e., 21 and 32 per cent, respectively.

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