



Research Note :

PRE-HARVEST FRUIT BAGGING IMPROVES FRUIT QUALITY OF MANGO IN DOON VALLEY

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ABSTRACT : Bagging in different fruit crops is beneficial because it improves appearance of fruit along with quality. A trial was conducted on 15 year young mango (cv. Mallika) orchard grown on degraded lands during 2014-015. The three different types of paper bags (Plastic bag, Blue paper, News paper) with control (Without bagging) were used for bagging of fruits after fruit formation (pre-harvest bagging) each with 100 no. of fruits for assessing incidence of insect, disease, fruit cracking and fruit blackening. Blue paper bagged fruits were recorded maximum improvement in fruit appearance like least insect-pest and disease attack in the fruit over un bagged fruits in Malika mango. Similarly, minimum fruit cracking and blackening was recorded in bagged treatment over unbagged treatment. Hence, fruit bagging in mango with blue paper bag is recommended for commercial use to the growers to escape attack of insect- pests and diseases, fruit cracking, and blackening.

Key words: *Fruit bagging material, fruit quality, mango.*

Mango is one of the commercially important fruit crops in the India. It is prone to attack of insect pests and diseases in all stages of development. One management practice which can help and address these problems is fruit bagging because it is another way of preventing contact between the host and insects/diseases as well as minimize mechanical injuries thus improving quality. Uttarakhand has an area of 40,211 ha and producing about 147272 metric tonnes of mango annually with very poor productivity (3.66 tha⁻¹) as compared to national productivity (7.3 tha⁻¹) of mango (NHB, 5). Almost all cultivars of mango are being produced of substandard quality because of high incidence of insect, pest, diseases, blackening and fruit cracking. Majority of mango orchards lies in Doon Valley which receives about 1500-1600 mm rainfall per annum and mostly farmers of this valley grow mango (cv. Dashehari, Langra, Chausa and sporadically Mallika and Amrapali) but these mango become ready for disposal during rainy season which are severely attacked by pests and diseases beside fruit cracking which reduces market price (Rathore and Jayaprakash, 6). As a result, growers are losing money by selling his produce at lower rates in the market. The higher returns for such mango cultivars may justify the use of control measures or good agricultural practice like fruit bagging to improve quality which may

otherwise be uneconomical for mangoes marketed during July - August in India.

Fruit bagging during development of fruits is used in Japan for the production of high quality, unblemished fruits (Kitagawa *et al.*, 4) and wrapping of fruit in newspaper is used in several Asian countries for fruit fly control. Covering of fruits individually or in groups or whole tree is practised with a suitable bag to protect from biotic infestation (insect-pests fungus, etc), fruit latex and rainfall (abiotic infestation) and to improve appearance of fruit with better quality. While some benefits (*e.g.* reduction in physical damage) could be expected, there may also be negative effects on quality, such as reduced red skin colour through reduction in irradiance (Haynes and Goh, 3) and loss of shelf or storage life, possibly through other physiological consequences of bagging, such as reduced fruit Ca (Cline and Hanson, 1).

A trial was conducted on 15 year young mango (cv Mallika) orchard grown on degraded lands during 2014-15. The three different types of paper bags (Plastic bag, Blue paper, News paper) with control (Without bagging) were used for bagging of fruits after fruit formation (pre-harvest bagging) each with 100 no. of fruits for assessing incidence of insect, disease, fruit cracking and fruit blackening. Data presented in Table 1 revealed that at the time of harvesting, the maximum 20 fruits were found infested with disease in case where fruits were not bagged followed by 16 fruits

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Table 1: Effect of fruit bagging on pest, disease, fruit cracking and fruit blackening in mango.

Bags	Total number of fruit bagged	No. of diseased fruits	No. of insect infested fruits	No. of cracked fruit	Blackening of fruits
Plastic paper	100	16	15	10	0
Blue paper	100	3	2	0	0
News paper	100	7	8	5	0
Control	100	20	40	30	100



Fig. 1. Mango (cv Mallika) bagged and un bagged fruit.

bagged with plastic bag and minimum with blue paper bag (3 fruits). Likewise, insect infestation, maximum 40 fruits were found infested with insects (unbagged treatment) and minimum no. of fruits with bagged materials. Similarly, fruit cracking is also a serious problem in mango during rainy season which has been addressed well by bagging of fruits. 100 no. of fruits were bagged and out of which 30 fruits were found cracked under treatment with bagging whereas all bagged treatments were noticed less than 10 % fruit cracking and was minimum with Blue paper bag. Doon valley falls under high rainfall zone where blackening of mango has been a serious problem among mango grower, which has been reduced to 100% by bagging and in case of without bagged tree fruits were found infected with blackening was also 100% (Hafman *et al.*, 2). The fruits in the Plate 1 showed the impact of bagging on appearance of fruit.

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