

EFFICACY OF DIFFERENT BAGGING MATERIALS FOR THE CONTROL OF MANGO FRUIT FLYD. SARKER¹, M. M. RAHMAN² AND J. C. BARMAN²

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Different bagging materials (black polybag, transparent polybag, brown paper bag) were evaluated for the control of mango fruit fly attacking Langra and Khirshapat variety at the mango orchards of Mango Research Station and Lac Research Station, Chapai Nawabganj during May to June 2001 and 2003. Though all bagging materials gave 100% protection of mango fruits against the fruit fly infestation, bagging of fruits with brown paper bag was found to be the best in protecting mango fruits and provides almost similar % total soluble solid (TSS) and physical fruit quality (expressed by % black spots) in bagged fruits when compared with the un-bagged healthy fruits of the control treatment.

Mango (*Mangifera indica* L.) is one of the most popular and important fruit crop among all fruits in Bangladesh covering the largest area (50,000 ha.) and the total production (1,90,000 tons) being in the 3rd position after banana and jackfruit (Bhuyan *et al.*, 2003). It provides a lot of energy with as much as 74 Kcal per 100g edible portion (Hossain, 1989). Both unripe and ripe mangoes are good source of vitamin C. Besides many other factors, insect pests play a vital role for the low yield and poor quality of mango fruits. The mango fruit fly, *Bactrocera dorsalis* (Hendel) (Tephritidae : Diptera) is a major pest of the mango fruits of Khirshapat, Langra, and Fazli varieties of mango (Karim, 1989). A huge quantity of mango fruits may be lost due to the fruit fly infestation every year. Bagging of mango fruits with paper or polythene bags may prevent the contact of female flies with the fruits, thereby protecting the fruits from oviposition. Bagging technique was reported as a successful control measure against the fruit fly for different types of cucurbits including bitter melon, sponge melon (Fang, 1982) and cucumber (Akhtaruzzaman *et al.*, 1999). Therefore, the present study was undertaken to compare efficacy of different bagging materials for the control of the mango fruit fly.

The study was conducted at the mango orchards of Mango Research Station and Lac Research Station, Chapai Nawabganj during May to June 2001 and 2003 as these two years were on-year in respect of flowering, fruiting, and fruit harvest. The treatments were bagging of fruits with black polybag (T₁), bagging of fruits with transparent polybag (T₂), bagging of fruits with brown paper bag (T₃) and control (no bagging) (T₄). The most susceptible Langra and Khirshapat varieties were used in the study against the fruit fly. Randomly selected 50 fruits

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from each tree of each variety for each of the bagging treatments were bagged 30 days before crop harvest. In 1989, Karim reported that *Bactrocera dorsalis* prefer to lay eggs on mango fruits at 30 to 40 days before crop harvest. So, 30 days before crop harvest was selected as proper time of bagging for the protection of fruit fly infestation. Fifty randomly selected healthy fruits of each variety were also marked by tags for the unprotected control treatment in separate trees 30 days before crop harvest. At the time of crop harvest, harvested fruits of all treatments were checked for recording fruit fly infestation and physical fruit quality. After fruit harvest, 10 randomly selected fruits of each treatment including the untreated control were analyzed for recording percent total soluble solids (% TSS) as the chemical fruit quality indicator.

Table 1. Efficacy of different bagging materials for the control of the mango fruit fly, *Bactrocera dorsalis* (Hendel) during mango season at Chapal Nawabgonj.

Varieties	Treatments	Location(s)					
		Mango Research Station			Lac Research Station		
		No. of healthy fruits	No. of infested fruits	% fruit infestation	No. of healthy fruits	No. of infested fruits	% fruit infestation
Langra	Polybag (black)	50	0.0	0.0	50	0.0	0.0
	Polybag (transparent)	50	0.0	0.0	50 I	0.0	0.0
	Brown paper bag	50	0.0	0.0	50	0.0	0.0
	Control (no bagging)	50	4.0	8.9	50	5.0	11.3
Khirshapat	Polybag (black)	50	0.0	0.0	50	5.0	11.3
	Polybag (transparent)	50	0.0	0.0	50	0.0	0.0
	Brown paper bag	50	0.0	0.0	50	0.0	0.0
	Control (no bagging)	50	4.5	9.8	50	6.5	14.2

Data are the averages of the year 2001 and 2003.

Results in Table 1 showed that all three bagging materials gave full protection against the fruit fly infestation when unprotected fruits of the control treatment showed 8.9 to 14.2% fruit infestation. Protected fruits either by black or transparent polybag showed reduced %TSS and increased level of physical

Table 2. Effect of different bagging materials on percent total soluble solid (%TSS) and other physical changes of mango fruits at crop harvest.

Varieties	Treatments	Location(s)			
		Mango Research Station		Lac Research Station	
		% TSS (averages of 10 fruits)	% black spots	% TSS (averages of 10 fruits)	% black spots
Langra	Polybag(black)	20.6	64.5	21.2	65.5
	Polybag (transparent)	21.3	52.9	21.1	49.6
	Brown paper bag	25.0	4.3	25.2	4.5
	Control (no bagging)	25.3	7.8	25.9	5.6
Khirshapat	Polybag (black)	19.3	51.6	20.1	44.5
	Polybag (transparent)	19.7	45.7	19.9	43.3
	Brown paper bag	24.6	5.5	24.2	4.1
	Control (no bagging)	24.9	8.7	24.6	7.6

fruit quality changes (% black spots) in mango fruits bagged as compared with the above values of healthy fruits of the untreated control (Table 2). Bagging of fruits by the brown paper bag showed almost similar % TSS (24.2 to 25.2%) and better physical fruit quality (4.3 to 5.5%) change as compared with those of the healthy fruits of the untreated control (24.6 to 25.9% TSS and 5.6 to 8.7% physical fruit quality change). In 1997, Hofman *et al.* reported that fruit mass, flesh colour, total soluble solids are not affected by white paper bag. Considering the fruit fly infestation, % TSS and physical injury on mango fruits, among the three bagging techniques, bagging of mango fruits with brown paper bag in both the locations was effective for the control of mango fruit fly.

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