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Desirability of Using Powerloom Cloth Bag for Selfing Isabgul (*Plantago ovata* Forsk)

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Isabgul (*Plantago ovata* Forsk) a dicotyledonous annual herbcultivated in North Gujarat and Rajasthan is one of the crops having high export potential. Isabgul has few tillers. Each tiller inturn has many spikes. Bagging of individual spike is time consuming, laborious and costly. It was an usual practice of selfing isabgul plants over the last several years to self the whole plant with selfing bag made of powerloom cloth. It was suspected that the mesh number (approximately) (5/mm^2) in such cloth bag would be sufficiently less, providing reasonably large pores through which the pollen of isabgul (0.00026 mm diameter) can pass through without hindrance. By this study an attempt was made to know whether the usuage of this kind of cloth is appropriate for selfing.

Two types of powerloom cloth bags, namely starched and unstarched were used to cover male sterile plants of variety Gujarat Isabgul 1. For each treatment and a control (i.e. open pollinated) 20 plants were used. Male sterile plants were identified immediately after anthesis in the first spike. These plants were recognised by the presence of small shrivelled anthers and male sterility of these plants was further confirmed by micro-scopic examination of their anthers; which showed no pollen grains.

The powerloom cloth bags used were of 45 cm length with 30 cm breadth. The specifications of fabric used were : threads per inch-warp 68, weft 48; count warp 30 and weft 34. Twenty starch free cloth bags were starched by soaking them for 20-30 minutes in starch solution prepared by boiling 150 g starch powder in 1.5 litres of water for 10 minutes.

Two or three spikes of each selected male sterile plants were covered with tissue paper bag either inside the powerloom cloth bag or in open, before the stigma in the lower most floret became receptive to confirm the male sterility of the selected plants. From every plant, spikes which showed one or more mature receptive stigma were cut off and then the whole plant was bagged and held in place by specially constructed iron frames. All plants were tagged for identification. The data on seed set were collected by observing individual florets of each spike of all the plants. Seed set on the spikes which were bagged with tissue paper bag inside the powerloom cloth bag were also studied.

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Two spikes, bagged with tissue paper bag inside the cloth bag did not set seed in any of the 60 plants studied, confirming that the plants selected for this study were male sterile. Per cent seed set in male sterile plants of isabgul covered with either starched or unstarched powerloom cloth bags revealed that out of 20 male sterile plants covered with starched powerloom cloth bag, 11 plants showed no seed set (Table 1) indicating effective barrier of

TABLE 1

Per cent seed set in male sterile Isabgul plants covered with either starched or unstarched powerloom cloth bags.

Plant No.	*Powerloom cloth bag*		*Control open-pollinated*
	Starched	*Unstarched*	
1.	3.33	10.49	99.15
2.	2.68	15.41	99.00
3.	0.00	22.41	98.85
4.	0.00	20.00	98.00
5.	0.00	11.89	97.45
6.	0.00	12.32	98.12
7.	3.24	13.33	98.25
8.	9.87	13.99	98.30
9.	0.00	11.14	97.30
10.	4.24	10.06	98.18
11.	0.00	15.30	98.45
12.	0.00	37.80	98.36
13.	9.95	23.39	97.50
14.	2.36	10.54	98.19
15.	0.00	9.39	99.10
16.	0.00	7.21	97.43
17.	0.83	30.22	98.40
18.	0.00	8.93	99.00
19.	9.46	14.37	98.65
20.	0.00	6.67	97.90
Total	45.96	302.86	1966.07
Average %	2.30	15.14	98.04
Range	0 to 9.87	6.67 to 37.80	97.42 to 99.15

the cloth for the pollen. While in the remaining 9 plants seed set varied from 0.83 to 9.87%. All the 20 male sterile plants covered with unstarched powerloom cloth bags set seed. Average per cent seed set was 15.14 indicating that pollen did pass through the bag and that powerloom cloth bag was not reliable for selfing isabgul plants. Krishnaswamy (1962) also reported unreliability of muslin cloth bag for selfing pearlmillet indicating that cotton fabrics did not fully prevent the passage of pollen grains.

From the study it can be concluded that the use of unstarched powerloom cloth bag for selfing is not reliable for isabgul as pollen can pass through the cloth. However, evenly starched powerloom cloth bag prepared by using cloth with considerable higher mesh number than the one used in this study can be used for selfing.

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