

Natural Crossing In the Cotton Variety Glandless Acala*

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Studies carried out with Glandless Acala as the female and Mc Namara Vine sap as the male parent during the summer and winter seasons of 1976 indicated 1.05 per cent of natural crossing. Therefore it can be recommended that bagging of flowers in the hybrid seed production programmes may be dispensed with and thereby the cost of production of hybrid seeds can be reduced considerably.

In recent years, hybrid seed production in cotton has been taken up on a massive scale in our country with the introduction of hybrid varieties like Varalakshmi, H, and CBS 156. Employment of manual labour and following up of strict certification requirements make the cost of seeds to go up considerably. In the production of hybrid seeds, bagging of the flowers is insisted upon to ensure genetic purity and this operation is to be done by trained hands and that too at the minimum speed so as to save the reproductive organs from damage. Thus this operation forms one of the main factor in boosting the cost of the seeds. Since cotton is an often cross pollinated crop and the extent of the activity of the insects decides the intensity of cross pollination, percentage of out crossing varies considerably from place to place. With a view to estimate the extent of cross pollination under Coimbatore conditions, studies were initiated and the results are presented below.

MATERIAL AND METHODS

The experiment was conducted in the summer and winter seasons of 1976 with varieties Mc Namara Vine sap and

Glandless Acala. The variety Mc Namara Vinesap possessing deep reddish purple stem, leaves, sepals and petals was used as the male parent. The varieties were raised in alternate rows in a 5 cent plot adopting a spacing of 90 cm between rows and 60 cm between plants in the row. The experiment was laid out in a plot which was isolated from other cotton crop by about 200 metres. Recommended agronomic practices were followed during the crop growth. Bolls from twenty five plants of Glandless Acala fixed at random were collected pickingwise for six pickings. The seeds from individual bolls were extracted pickingwise and dried.

Flat nursery beds of the size 3 × 1 m were thrown into small furrows breadthwise, with a spacing of 5 cm between furrows. The seeds after one month were sown pickingwise adopting a spacing of 2 cm between seeds in the furrows and covered with soil. Immediately after sowing, irrigation was given. On the 3rd day life irrigation was given. On the 25th day after sowing, the number of seeds germinated and the number of seedlings with deep reddish purple

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pigmentation in the stem, cotyledons and leaves were counted and recorded. By dividing the number of plants with deep reddish purple pigmentation by number of seeds germinated and multiplying by 100, the extent of out crossing was calculated.

RESULTS AND DISCUSSION

The percentage of natural crossing among pickings ranged from 0.57 to 2.32 with a mean of 1.11 in summer and from 0.68 to 1.63 with a mean of 0.98 in winter (Table I). The extent of natural crossing in cotton has been estimated to vary from 2 to 40 per cent depending upon the variety season, insect activity and cultural practices (Afzal and Khan, 1950; Douglas and Adamson, 1964; Thomson, 1966; Meredith In the present investigation, the percentage of out crossing was rather very low in both the seasons. A maximum percentage was recorded in the second picking in both seasons and thereafter it decreased and reached the minimum in the sixth picking. Afzal and Khan (1950) reported similar results.

In the seed multiplication programmes involving varieties out crossing has considerable practical significance since it results in the erosion of genetic purity of varieties. This is one of the major causes for running out of varieties (Cook, 1921). In the present study,

since the percentage of out crossing was found to be below two per cent in both the seasons, in the production of hybrid seeds bagging of flowers in the parents can be dispensed. Patel (1974) came to similar conclusions in his experiments with the parents of H4 hybrid cotton.

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Table 1 Extent of natural crossing in the variety Glandless Acala during the summer and winter seasons of 1976

	Number of plants raised	Number of hybrid plants detected	Percentage of natural crossing
summer			
1st picking	1263	14	1.11
2nd picking	1420	33	2.32
3rd picking	2397	23	0.96
4th picking	2182	20	0.92
5th picking	2153	17	0.80
6th picking	871	5	0.57
Winter			
1st picking	1123	11	0.98
2nd picking	1536	25	1.63
3rd picking	2957	31	1.05
4th picking	2324	18	0.78
5th picking	2212	17	0.77
6th picking	0037	7	0.68