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Development of Unique Genotypes in Different Field Crops

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Dharwad farm of University of Agricultural Sciences has developed some new genotypes in cotton, chilli and greengram. It has been claimed that these varieties are unique in their characters. The genotypes included 3 varieties in cotton (BAR-97-GB : giant boll variety immune to blackarm disease; JK 276-4 : multiple pest resistant variety, highly tolerant to boll-worm, aphids, jassids, thrips and white flies; BCS-9-95 : extra long staple, high yielding, high ginning variety of Gossypium barbadense; *one each in greengram (KCM-1 : non-shattering, long podded, erect and bold seeded type) and chilli (KDSC 100 to 500 series : virus and leaf spot disease resistant varieties). The paper deals with these new developed cultivars.*

Utilization of germplasm in the transfer of gene confirming resistance to pests and diseases as also better plant type in the development of high yielding cultivars with broad agronomic base has been the main objective in crop improvement programmes in recent years. In the absence of any genepool, the breeders would have the task of creating new and unique genotypes through well planned hybridization programmes or by resorting to mutation breeding for selecting new strains (mutant) not found earlier in cultivated species.

MATERIALS AND METHODS

Six divergent genotypes (JK 99, CPD801, Stoneville 213, DB 811, Dixie King, and MC 45) were used in a composite cross creating improved cultivar BAR JK 97 GB. The composite crossed F_1 progenies to JK 97 *inter-se* mating within families was made for high boll number and boll weight. Further, thirty six genotypes (*G. hirsutum*) were crossed with JK 97 and JK 44 separately and $72F_1S$ were composite crossed as also shown earlier by Jensen (1970). The multiple pest resistant varieties JK 276-4, JK 259-7 and JK 281-1 were evolved through this methodology. Besides, eighteen different genotypes were crossed with S.I. Andrew and composite crossing of F_1 was resorted for the development of BCS-95 and BCS23-18-7. In *mungbean* X-ray radiation (20 kr) was used in the development of non-shattering pod types, bold seeded variety KDM-1. In case of chilli (*C. annuum*) double crosses between Byacagi, Jwala, Sankeshwar and *C. frutescence* were made and promising selection identified.

RESULTS AND DISCUSSION

Commercial cotton crop suffers heavily from damage caused by insect, pests (jassids, boll worms, aphids, thrips, and white flies). Genepool providing resistance to several insect pests of cotton is not available either in the wild or cultivated species of *Gossypium*. Therefore, development of multiple pest resistance in *G. hirsutum* cotton was taken up and new strains JK 576-4, JK 259-7 and 7K 281-1-1 with high yield potential of seed cotton upto 20 q per ha were attained (Kadapa and Thimmaiah, 1983). Cotton cultivars of the *G. barbadense* group possess excellent fibre quality and Egyptian cotton varieties are world famous. These varieties are poor yielder and possess less than 30 per cent lint; variety Suvin released in India produces slightly higher yields but has a GOT less than 28 per cent, although fibre quality is excellent. The present paper highlights the attempt to develop varieties that are not only 50 to 100 per cent high yielding but possess GOT of above 33 per cent with best fibre quality. promising strains included BCS 9-95 and BCS 23-18-7 (Anon. 1986).

Composite crossing of a large number of genetically diverse F_1 hybrid was undertaken. The programme involving several hybrid being highly segregating resulted in unique genetic recombinants. The variability thus generated exhibited rich genetic diversity. Sharma (1979) in a composite cross population showed that genetic diversity created through his methodology was much larger than the existing 6000 cotton germplasm accessions. The procedure allows selection of rare and entirely new recombinants.

In the present investigations, all the new cotton genotypes were developed by composite crossing system. The unique genotype BAR-JK97-GB possessed a boll weight range of 10.2 to 12.8 per cent and also immunity to blackarm disease. In AICCIP trials conducted at Raichur (Karnataka), the variety produced, 48 q per ha seed cotton and 40 bolls per plant (Anon. 1986).

New stains JK 276-4, JK 259-7 and JK 281-1-1 were found to be highly tolerant to all the three boll worms; *Heliothis armigera, Erias febia* and *Pectinophora gossypiella* and to jassids (*Empoasea bigutella*), aphids (*Aphis gossypi*). The above strains produced upto 20 q/ha seed cotton without any plant protection measures. In the all India co-ordinated trials *G. barbadense* strains BCS9-95 and BCS23-18-7 produced 20-23 q/ha seed cotton against 10-14 q/ha in *Suvin* and also with superior fibre and spinning quality.

In *Mungbean* (*V. radiata L.*) which suffers heavily from pod shattering, the development of cultivars with non pod shattering habit and bold seededness is of high significance. The variety KDM-1 developed through X-ray radiation showed immense promise. The new bred cultivar produced 1142 kg per ha seeds in multiplication trials and exhibited high non pod shattering habit.

In similar attempt, new chilli (*Capsicum* sp.) varieties were bred. Most of the prevalent varieties suffer heavily from virus diseases, a double cross (Byadagi X *C. frutesence*) X (Jawala X Sankeshwar) was envolved. The populatlons were subjected to 'hot spot' screening for virus diseases.

In conclusion, it may be stated that using appropriate genotypes and adopting composite cross methodology in cotton, mutation breeding in *mungbean* and double hybrid in case of chilli, good results were obtained.

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