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Combining ability for yield and quality traits in intra hirsutum hybrids of cotton (*Gossypium hirsutum* L.)

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Investigation was carried out at Agricultural College Students' Farm, Bapatla, Andhra Pradesh during *Kharif* 2010-11 with 84 intra-hirsutum cotton (*Gossypium hirsutum* L.) hybrids derived from 19 parents (12 lines and 7 testers) which were developed from new heterotic gene pools through line × tester fashion along with two check. The genetic variability studies indicated that the material used in the present study possessed sufficient variability which gives ample scope for improvement through simple selection procedures. High heritability accompanied by high genetic advance was observed in case of plant height, number of monopodia, number of sympodia, relative water content, specific leaf weight, crop growth rate at peak flowering stage, crop growth rate at boll formation stage, crop growth rate at maturity stage, boll weight, seed index and lint index indicating the role of additive gene action in the inheritance of these traits and directional selection may be rewarding.

The correlation and path analysis revealed that lint yield per plant had high positive direct effect coupled with high significant positive correlation. The other important traits identified were boll weight and number of sympodia per plant but they exerted direct effects at lower magnitude. Majority of the traits studied exerted prominent positive indirect effects via lint yield per plant. Further it was also observed that important fibre quality parameters like ginning out-turn, 2.5% span length and bundle strength showed undesirable association with the above traits and also among themselves. So care should be exercised in simultaneous improvement of these traits without sacrificing fibre quality, since the cotton is valued for its lint.

Estimates of variance due to *gca* and *sca* and their ratios revealed the importance of non-additive gene action for all the traits studied. Non-additive component may be exploited through heterosis breeding. It also helps in varietal adaptability. Among the 19 parents involved, the lines RAC 99152 followed by RAH 178-4, NAWAB and RAH 97-612 and in testers SC 68 followed by SC 7- IPS and SC 40 were identified as potential general combiners for important yield component traits. These parents may be involved in future varietal improvement programmes. Based on *per se* performance, high *sca* effect and standard heterosis, the top specific cross combinations identified for seed cotton yield and other component traits were RAH 370 × SC 31 and RAH 178 × SC 40. This suggested the possibility of direct utilization of these hybrids for commercial exploitation after thorough testing over larger number of diversified environments and seasons. The progeny of these crosses may be further advanced to isolate superior segregants in further generations or pedigree breeding to combine not only seed cotton yield but also fibre quality of the derived lines.

Biography

N Vineela completed her M.Sc. agriculture from Acharya N. G. Ranga Agriculture College and University, Bapatla. She had done specialization in Genetics and Plant Breeding. Her research work was carried on 98 hybrids of cotton; major emphasis in her 2 years of research program was given to find out the best general and specific combiner within these 98 hybrids. Four articles of her work had been published, out of which 2 are in national and 2 in international journals.

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Induced variability in maturity period of lentil (*Lens culinaris* Medik.) by methyl methane sulphonate

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Lentil (*Lens culinaris* Medik.) is an important pulse crop of winter season. Seeds of lentil variety DPL-15 were treated with various concentrations of methyl methane sulphonate (MMS), an alkylating chemical mutagen. Four early maturing mutants were screened in M₃ generation with 0.02% MMS treatment. Mutant plants matured in 125 days compared to 134 days of control plants. The mutants had bold seeds and gave higher seed yield per plant. High values of genetic parameters provide scope for further selection.

Biography

Shahnawaz Khursheed completed his M.Sc. in Botany in 2009 from Aligarh Muslim University. After that he was registered in Ph.D. in the same university last year in December 2012. Today he is pursuing his Ph.D. in AMU. His research area is Plant Breeding and Genetics and is working in Mutation Breeding Lab. He is doing his research on Mutation Breeding of Pulse Crops.

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