Quantitative Genetic Studies of Some Economic Traits in Patanwadi & its Crosses with Rambouillet & Russian Merino

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The present study was undertaken with the major objective of evaluating Patanwadi and its crosses with Rambouillet and Russian Merino as regards the growth traits viz., birth weight, weaving weight, pre-weaning average daily gain, six monthly weight, yearling weight and post-weaning average daily gain, wool traits viz., greasy fleece yield at first, second and third six monthly intervals, fibre diameter medullation and staple length and reproduction traits viz. age and weight at first oestrus, conception and lambing.

The data on 1846 animals belonging to Patanwadi, Rambouillet x Patanwadi and Merino x Patanwadi crosses (F_1's,F_2's and $\frac{3}{4}$ breds) maintained at All India Co-ordinated Research Project on Sheep Breeding (Fine Wool), Sardar Krushinagar from 1979 to 1984 were used.

The results indicated that effect of breed groups, years and seasons of birth were significant for all growth traits and wool traits, except for medullation, where season had non-significant effect. Breed group effect was non-significant for age at first oestrus and lambing. Significant effect of year was observed for all reproduction tarits, but season showed non-significant effect only for age at first oestrus. Sex effect was highly significant for all growth traits, and non-significant for wool traits.

Results of growth traits indicated that Patanwadi combined equally well with Rambouillet and Merino at 50% level of exotic inheritance. No decline in F_2's was observed. Three quarterbreds showed non-significant improvement over F_1's. Merino three quarterbreds were more superior. Hertibility estimates were low, indicating poor correlation between genotypes and phenotypes. Genetic and phenotypic correlations indicated that weaning weight or six monthly body weight is the character of choice for inclusion in selection index.

The wool traits also exhibited suitability of both the exotic breeds for crossbreeding with Patanwadi. Significant improvement in halfbreds and three quarterbreds was observed over native, F_2's did not show any improvement over F_1's. Three quarterbred were similar to halfbreds in respect of wool production but improvement in quality was noticed with increasing level of exotic inheritance, indicating superiority of three quarterbreds. It was recommended to marge the F_1's and F_2's of both the breed groups to form a synthetic and maintain three quarterbreds separately for further investigations. The heritability estimatic for greasy fleece yield was moderate to high in Patanwadi and in Rambouillet x Patanwadi halfbreds, but low in Merino x Patanwadi halfbreds. Wool quality traits have low estimates of heritability. The estimates of genetic and phenotypic correlations indicated that for higher yield of better qulity wool first or second six monthly greasy fleece yield and fibre diameter needs to be incorporated in the selection index. Selection should be performed in such a way that best genotypes are allowed to propagate further.

The reproduction traits indicated that Patanwadi had the lowest weight and early maturity in comparison to crossbreds. Though crossbreds had significantly higher body weight at all the three ages, they did not differ significantly for age at first oestrus, first conception and first lambing. The heritability estimates for most of these traits were low except for age and weight at first lambing. The genetic and phenotypic correlation reported were low to moderate and positive.

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