

Studies On Combining Ability For Yield, Quality And Physiological Characters In Late Summer Brinjal

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ABSTRACT

Combining ability analysis of a 10 x 10 diallel, excluding reciprocals was undertaken for fruit yield, yield components, quality and physiological characters in round brinjal during late summer season. Non-additive gene action was noticed to be pre-ponderant for all the traits studied. A perusal of the *gca* effects revealed KS 224, PLR 1, Morvi 4-2 and JBPR 1 to be good general combiners for fruit yield per plant. In addition, KS 224 was observed to be a good combiner for total phenols; while PLR 1 and Morvi 4-2 were noticed to be good combiners for total soluble sugars. These parents had also recorded high *per se* performance for the traits, indicating their suitability in breeding programmes for development of high yielding and quality hybrids. Among the hybrids, 22 crosses had exhibited significant and desirable *sca* effects for fruit yield per plant. Of these, nine crosses had recorded desirable *sca* effects in addition to significantly high *per se* performance, compared to hybrid mean for the trait. An analysis of these crosses revealed the involvement of a good and a poor general combiner parent for majority (66.7%) of the crosses and both good parents (33.3%) in few crosses. The hybrid, KS 224 x PLR 1, involving both good combiner parents for fruit yield per plant, had recorded maximum fruit yield, in addition to desirable *sca* effects for fruit yield. The hybrid had also recorded desirable *per se* and *sca* effects for 1000-seed weight, fruit drymatter and leaf area per plant. Hence, it is identified as a potential hybrid for commercial exploitation during late summer season. The hybrids, KS 224 x AB 98-10, AB 98-10 x PLR 1, PLR 1 x Gandhinagar Local, PLR 1 x Morvi 4-2, PLR 1 x JBPR 1 and Morvi 4-2 x Surati Ravaiya had also recorded significant and desirable *sca* and *per se* effects for the quality traits, in addition to high fruit yield per plant and hence, hold potential for late summer season.

Key words : Brinjal, Combining Ability, Late Summer, Yield, Yield Components, Quality, Physiological characters.

INTRODUCTION

Brinjal is an important vegetable crop being increasingly grown during summer season, as an off-season vegetable in Gujarat for its premium price during the season. The productivity of F₁ hybrids in brinjal has been reported to be high, compared to varieties (Varghese and Vahab, 1994). Further, the use of hybrid cultivars of brinjal has been predicted to increase in the country in the ensuing years (Singh, 2000), owing to low cost of hybrid seed due to higher rate of successful cross setting and large number of seeds per fruit. Brinjal hybrids with high fruit drymatter and total soluble sugars in addition to low seed weight and total phenols are highly desired by the consumers and therefore attract premium price in the market.

In Gujarat, the summer crop is normally sown during first week of February. However, under contingency conditions of extreme and prolonged winter, sowing of the

crop gets delayed, as low soil temperatures adversely effects germination and therefore, a late summer crop, sown in the second fortnight of February is raised. Crop improvement programmes aimed at the development of high yielding and quality hybrids for late summer situation require information on combining ability of the genotypes during the late summer season with regards to yield, yield components and quality traits, including physiological growth parameters such as leaf area per plant, reported to have a direct impact on fruit yield in brinjal (Chaudhary and Malhotra, 2000). This helps in the identification of superior parents with better *gca* and crosses with high *sca* effects during the season. Knowledge on the nature of gene action governing the traits is also essential for planning systematic breeding programmes. In this context, the present investigation was undertaken to elucidate information on the nature of gene action and combining ability of round brinjal genotypes for fruit yield, yield components, quality and physiological characters, in addition to identification of suitable high yielding and quality

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