

Development of new early maturing cytoplasmic genetic male sterile lines in pigeonpea (*Cajanus cajan* (L.) Millspaugh)

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Abstract

Sufficient level of heterosis and out crossing (>70%) in pigeonpea provides opportunity for the development of hybrid varieties. Earlier, GMS based hybrids were developed by different research institutes. However, due to inherent problem of maintenance of male sterility and high cost of hybrid seed production they could not be popularized. Thereafter work on development of CGMS lines was initiated by GAU, S.K. Nagar and ICRISAT, Hyderabad. The CGMS lines developed by these institutes were of medium to late maturity group and were not suitable for pigeonpea-wheat cropping system under north-western Indian conditions. Thus, a need was felt to develop early maturing CGMS lines to develop early maturing hybrids for this zone. In the first phase, early maturing and stable CGMS lines viz., AL100A, AL102A and AL103A in A2 cytoplasmic background were developed, and utilized in hybrid breeding. In the second phase, fourteen new male sterile lines were developed in A2 CMS background. These newly developed lines, were found stable for their cytoplasmic sterility across diverse agroecological locations across seasons. These lines can be used to develop early maturing high yielding hybrids suitable for pigeonpea-wheat rotation of north-western India. Sufficient level of heterosis and out crossing (>70%) in pigeonpea provides opportunity for the development of hybrid varieties. Earlier, GMS based hybrids were developed by different research institutes. However, due to inherent problem of maintenance of male sterility and high cost of hybrid seed production they could not be popularized. Thereafter work on development of CGMS lines was initiated by GAU, S.K. Nagar and ICRISAT, Hyderabad. The CGMS lines developed by these institutes were of medium to late maturity group and were not suitable for pigeonpea-wheat cropping system under north-western Indian conditions. Thus, a need was felt to develop early maturing CGMS lines to develop early maturing hybrids for this zone. In the first phase, early maturing and stable CGMS lines viz., AL100A, AL102A and AL103A in A2 cytoplasmic background were developed, and utilized in hybrid breeding. In the second phase, fourteen new male sterile lines were developed in A2 CMS background. These newly developed lines, were found stable for their cytoplasmic sterility across diverse agroecological locations across seasons. These lines can be used to develop early maturing high yielding hybrids suitable for pigeonpea-wheat rotation of north-western India.

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