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Title: EVALUATION OF CMS LINES AND ITS MAINTAINERS IN PIGEONPEA (Cajanus cajan L. Millsp.)

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**Abstract:** Ten lines [Five male sterile lines (A) and five maintainer lines (B)] of pigeonpea [*Cajanus cajan* (L.) Millsp.] were subjected to investigation and evaluation for their quantitative (12) and qualitative (10) attributes under Ranchi condition at GVT Pulse Farm, Kanke, Ranchi, Jharkhand during Kharif 2012- 13. The observations were made for twelve quantitative and ten qualitative characters. Significant differences were observed among the lines for all the traits; indicating the presence of efficient variability among the male sterile lines and the maintainer lines. As per the fisher's t-test among five groups A<sub>1</sub>B<sub>1</sub>, A<sub>2</sub>B<sub>2</sub>, A<sub>3</sub>B<sub>3</sub>, A<sub>4</sub>B<sub>4</sub>, A<sub>5</sub>B<sub>5</sub>, the average performance of A<sub>1</sub>B<sub>1</sub>, A<sub>2</sub>B<sub>2</sub> and A<sub>4</sub>B<sub>4</sub> was good in comparison to others as in these groups, only two significant differences in their average performance were observed between the characters. Based on the paired t-test, only in two groups i.e., A<sub>1</sub>B<sub>1</sub> and A<sub>2</sub>B<sub>2</sub>, significant mean differences were observed for only two characters. According to this test; ICPA 2043 (A<sub>1</sub>) and ICPA 2078 (A<sub>2</sub>) may be utilized for future breeding and its maintainers for its maintenance. On the basis of average pod setting in bagged plant of male sterile lines, the highest number of pods was found for ICPA 2078 (8 pods) and lowest for ICPA 2092 (Zero pod). The pod setting value is very low or negligible; suggesting that all male sterile lines performed well in Ranchi condition particularly ICPA 2092(A<sub>4</sub>) followed by ICPA 2047-24(A<sub>3</sub>) and ICPA 2051(A<sub>5</sub>). The survival percentage of all male sterile lines (A) was observed more in comparison to its maintainer lines. Male sterile cytoplasm has effect on plant's survival in desired direction on the basis of survival percentage of different male sterile and maintainer lines. On the basis of pollen sterility and fertility test, the maximum pollen sterility was observed for the line ICPA 2078(A<sub>2</sub>) whereas lowest pollen sterility was found ICPA 2092(A<sub>4</sub>) line, although all male sterile lines were found suitable for Ranchi condition. The pollen fertility of maintainer lines were observed maximum for ICPB 2047-24(B<sub>3</sub>) and lowest for ICPB 2043(B<sub>1</sub>). All were upto the mark as per standard pollen fertility percentage required for maintainer lines. Among all five groups, correlation coefficient were observed for different characters and significance test were also observed through z-test for all the groups i.e., A<sub>1</sub>B<sub>1</sub>, A<sub>2</sub>B<sub>2</sub>, A<sub>3</sub>B<sub>3</sub>, A<sub>4</sub>B<sub>4</sub>, A<sub>5</sub>B<sub>5</sub>. No any differences were observed for the characters namely; branching pattern, plant growth habit, leaf shape, leaf pubescence, flower colour, streak on flower, pod waxiness, pod colour, pod pubescence and stem colour. The result obtained from present investigation indicated that all the A lines were found better but ICPA 2047-24(A<sub>3</sub>) was found best on the basis of observation of field as well as lab test. None of the lines were found significantly different for all morphological characters. All were found at par as compared to A and B lines. Male sterile cytoplasm is affecting germination percentage in all the CMS line in positive direction. Male sterile cytoplasm has effect on plant's survival in desired direction i.e., high survival % in CMS line as compared to maintainer line. In the present investigation, male sterile cytoplasm was not affected any of the qualitative traits. However, male sterile cytoplasm has significant affect on quantitative traits.

**Description:** EVALUATION OF CMS LINES AND ITS MAINTAINERS IN PIGEONPEA (*Cajanus cajan* L. Millsp.)

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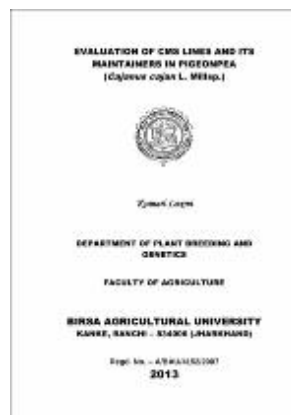
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