

## MARKER ASSISTED BACKCROSS BREEDING TO ENHANCE DROUGHT TOLERANCE IN KENYAN CHICKPEA (*CICER ARIETINUM* L.) GERMPLASM

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### Abstract

Drought is the number one constraint in chickpea production. In the past, breeding efforts to improve terminal drought tolerance have been hindered by its quantitative genetic basis and poor understanding of the physiological basis of yield in water-limited conditions. This is because quantitative traits are controlled by multiple genes whose inheritance patterns are difficult to predict. Recent research efforts, in chickpea have enabled the development of a larger number of molecular markers, expressed sequence tags (ESTs), dense genetic maps and molecular markers associated with QTL/gene conferring resistance to drought. With the aim of improving drought tolerance amongst chickpea genotypes, two cultivars (ICCV 4958 (Desi) and ICCV 8261 (Kabuli) have been identified as sources of resistance with QTL drought traits and used to improve drought tolerance of two Kenyan elite lines (ICCV 97105 and 95423) through the marker assisted backcross breeding. Initially 10 Kenyan elite superior lines (ICCV 92944, ICCV 97105, ICCV 00108, ICCV 97126, ICCV 92311, ICCV 92318, ICCV 95423, ICCV 96329 and ICCV 97306) were analyzed for polymorphism with donor parent (ICCV 4958 and 8261). This analysis showed that two genotypes, ICCV 97105 and 95423, had the highest polymorphism with donor parents. Crosses were made between these two genotypes and the donor parents and F1 drought tolerant progenies were obtained. The F1 plants will be crossed to the recurrent elite cultivar to get BC1F1. For genetic stability, the BC1F1 plants will be selfed to obtain BC1F2 plants which will then be evaluated. Marker assisted foreground and background selection will be done to identify appropriate BC1F2 plants for next cycle of backcrossing.

**Key words:** Marker Assisted Backcross (MABC), Drought tolerance, Donor parent, Recipient parent, Quantitative trait loci (QTL).