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ENHANCING EFFICIENCY OF MUTATION BREEDING FOR STRIGA RESISTANCE IN SORGHUM BY HAPLOID TECHNOLOGY

Plant breeding programmes are based on creating genetic variation and selection of desired genotypes. Induced mutation and selection has been used extensively to improve yield, quality, disease and pest resistance in a wide range of crops. Root parasitic weeds in the genus Striga are the major biological constraints to sorghum production in sub-Saharan Africa and parts of Asia. Progress in haploid/doubled haploid production, such as the rapid generation of large microspore-derived haploid populations via androgenesis, may be exploited in mutation breeding. The present study was conducted to develop and apply haploid protocols in sorghum, which has been a recalcitrant species for this procedure. Starvation stress using B medium, cold (4-7℃ for 1-7 weeks) and heat shock (30-33℃ for 1-6 days) were used as pre-treatments on cultivars/lines KFS 18, ICSR14001, ICSV112 and S-35 (provided by ICRISAT). Microspores were isolated by different isolation procedures (stirrer and blender) and cultured on various induction media (AT3, NLN-13, B5 and N6) and incubated at 30-33℃ for 1-6 days and then transferred to 25℃ in the dark. For the first time in sorghum microspore embryogenesis was observed: multi-cellular structures were formed when microspores were isolated from cold-pre-treated panicles, and incubated at 33℃/3d then cultured in AT3 induction medium. The protocol developed is being improved to get embryos and finally doubled haploid plants, and then to exploit the system to produce doubled haploid mutants which can be introduced in a mutation induction programme then screened for striga resistance.

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