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The use of doubled-haploids in cassava breeding

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Abstract. Cassava breeding is difficult and, compared with other crops, inefficient. The problems in cassava breeding relate to the length of the breeding cycle, the large genetic load present in the crop, and the heterozygous nature of the parents and progenies evaluated. The production of doubled haploids, through tissue culture techniques, offers interesting advantages. By definition, any process that involves increased homozygosity will result in a decrease of genetic load. Doubled-haploid lines, therefore, are expected to produce better hybrids. Furthermore, the availability of homozygous lines would allow for a gradual and consolidated breeding to improve parental performance in hybrid combinations. This means that the genetic enhancement will benefit from previous gains, like steps in a staircase. The breeder "*owns*" the genetic superiority of an inbred progenitor but that is not necessarily the case with heterozygous parents, particularly in heterozygous crops like cassava. With the introduction of doubled-haploids, the emphasis of cassava breeding shifts from producing large number of hybrids (hoping to find a superior one) to improving parents for the production of better hybrids that are "*designed*", not just found. In addition to these advantages doubledhaploids will facilitate discovery and exploitation of recessive traits and germplasm conservation. One important additional advantage is that germplasm exchange could be greatly facilitated, thus helping to bridge the relative isolation in which cassavabreeding projects in different countries currently operate.