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REDUCING POST-HARVEST PHYSIOLOGICAL DETERIORATION IN CASSAVA ROOTS: THE NIGERIAN EXPERIENCE

Cassava roots are notable for their short shelf-life due to post-harvest physiological deterioration (PPD). PPD is initiated by mechanical damage, which occurs during harvesting, making the roots unpalatable and unmarketable within 72 hours. Extending the shelf life of cassava to several weeks would reduce financial losses by \$2.9 billion in Nigeria over a 20-year period. Our main approaches at NRCRI aimed at reducing Cassava PPD include conventional breeding, mutagenesis, molecular breeding and genetic engineering. Over 150 land races and 120 exotic genotypes have been screened for delayed PPD. Limited variability was observed amongst land races in this trait. Thirty three genotypes with delayed PPD at 7 days after harvesting (DAH) and 22 with delayed PPD at 14 DAH have been identified from backcross populations of *Manihot walkerae*. Gamma radiation was used to induce genetic variation for delayed PPD in these local germplasm. Mutagenized populations were developed using in-vitro plants and OP seeds of farmer preferred varieties and land races. Few genotypes from these populations had low PPD (7DAH). Genetic mapping for PPD using genomic DNA isolated from young leaves of parental genotypes indicated that genetic factors, most likely major QTLs, were likely involved in the expression of delayed PPD in cassava. Another strategy adopted was to use the synergistic effect of over expressing nuclear encoded gene, alternative oxidase (AOX) and increased accumulation of beta carotene content in cassava roots to delay onset of PPD. Constructs carrying appropriate genes were successfully transferred into cassava and plants expressing the inserted genes have been obtained and are being evaluated appropriately in different agro-ecologies of Nigeria. Furthermore, markers for PPD are being developed, and image analysis method of assessing roots for PPD is being introduced to help straighten and fast-track the selection of genotypes with delayed PPD.

Country or International Organization

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