

5. Genetic Resources Unit: Facilitating Germplasm Enhancement in Africa

Since its inception in 1970, WARDA has been involved in genetic-resources activities, specifically collection, preservation, characterization, evaluation, multiplication and distribution of promising germplasm to rice scientists in Africa and throughout the world. Germplasm collection in West Africa by both international and national research centers started in the mid-1960s and intensified in the 1980s. Germplasm collected includes *Oryza sativa*, *O. glaberrima*, *O. longistaminata*, *O. barthii* and *O. stapfii*. From 1985 to 1993, WARDA received from NARS, IRAT, IITA and ORSTOM (IRD) over 6000 accessions consisting of *O. sativa* (4800), *O. glaberrima* (1200), *O. longistaminata* (10), *O. barthii* (6) and *O. stapfii* (3). New collections of landraces were made recently in Côte d'Ivoire and Guinea.

To strengthen genetic-resources activities, WARDA formally created a Genetic Resources Unit in 1999, within which the International Network for Genetic Evaluation of Rice for Africa (INGER-Africa) is nested. Today, the genebank contains close to 20,000 rice accessions, stored as working collections in four cold rooms at M'Bé. Long-term conservation is undertaken at IITA (Ibadan, Nigeria) with duplicates being sent to IRRI in The Philippines. Germplasm characterization and evaluation are on-going activities. Most of the *glaberrima* and modern *sativa* accessions have been characterized and the data included in the CGIAR's SINGER database. A special effort is being made to screen for major diseases and environmental stresses such as acidity, iron toxicity, cold and salinity.



Over the past 10 years, WARDA has significantly strengthened its germplasm distribution, regional evaluation and utilization activities in Sub-Saharan Africa. Improved germplasm is multiplied, processed and distributed through INGER-Africa nurseries for evaluation and utilization by national programs throughout Africa. As a result, between 1994 and 2000, more than 200 high-yielding and stress-tolerant lines were released in Africa. In 2000, studies were initiated to better understand the ways in which local communities manage rice biodiversity, as these local practices are a key to improved *in-situ* conservation.



WARDA has played a significant role in supporting genetic-enhancement activities in Africa. A tangible example is the recent development of NERICA rice from *glaberrima* accessions collected more than 20 years ago. Through the screening of genebank materials, genes for resistance to major diseases and insect pests such as rice yellow mottle virus (RYMV), blast and African rice gall midge are now available. Other important aspects of the Unit's work include the restoration of lost germplasm to war-affected countries, provision of conservation services to NARS, and training and capacity building.

As part of its genebank upgrade plan during the next decade, WARDA will set up modern conservation facilities for long-term storage of rice germplasm at its main research center in M'Bé. WARDA will be able to fulfill its long-term

conservation commitment as rice accessions will be conserved using recognized international standards. Better genebank management systems, and modern information and communication technologies will be used to improve seed distribution and access to rice germplasm.

Further reading

Dalton, T. and R. Guei, 2003. Productivity gains from rice genetic enhancements in West Africa: Countries and ecologies. *World Development* 31(2): 359–374.

Guei, R.G., A. Adam and K. Traore, 2002. Comparative studies of seed dormancy characteristics of two *Oryza* species and their progenies. *Seed Science and Technology* 30(3): 499–505.

