

**Editor's note**

This issue features two themes that are close to the heart of WARDA–The Africa Rice Center:

(1) the potential of integrated crop management (ICM) approach for irrigated rice farming, shown through the case study of Mauritania; and

(2) effective networking as exemplified by the ROCARIZ Network.

Both activities are living examples of WARDA's vision and mode of operation, showing the power of partnership in action. Both capture the essence of WARDA in their own distinct way.

The article *Hope for a desert country* explains how ICM is transforming rice farming into a highly productive sector in Mauritania.

The story *At the center of the rice research and extension web in WCA* describes the various ways through which ROCARIZ enhances the capacity of national agricultural research systems (NARS) in the area of rice, and is increasingly being recognized as a regional model for rice research and extension in West and Central Africa.

In *News and Notes* you will see glimpses of the milestones in WARDA's life: awards and achievements that extend the horizon of the rice R&D in Africa.

**Maintaining WARDA's research momentum**

I would like to take this opportunity to share with you some of the exciting developments that are taking place in WARDA, confirming that the Center's research quality continues to meet the highest international standards and win widespread recognition.

One such recognition was the 'Grand Prix du Président de la République pour les Sciences' — Senegal's highest award for Science — that President Abdoulaye Wade personally conferred on 30 June 2003 on the WARDA team based in Senegal and its partners for the adaptation and dissemination of the ASI thresher-cleaner, the most widely used rice thresher in the country.



*Dr K Miezán, Leader of WARDA's Irrigated Rice Program (left), receiving Senegal's highest Science Award from the President of Senegal, Abdoulaye Wade*



*Rice trials in Bamako, Mali*

WARDA's research activities that have been temporarily relocated from Ivory Coast to Mali are thriving and it was an incredible experience for me during my recent trip there to see our rice trials flourishing under marginal upland conditions, which again proves that commitment and partnership can overcome major obstacles.

Our scientists have been actively engaged in the 2003 research planning meeting and the development of the Strategic Plan. WARDA is also fully involved in the development process of the Challenge Program for sub-Saharan Africa (SSA) as well as in discussions with partners on the future course of action for the dissemination of NERICA. Dr Inoussa Akintayo, who has just joined WARDA as the African Rice Initiative (ARI) Coordinator will add the necessary fillip to this effort.

I wish to thank all our partners and inform them that the peace process in Ivory Coast is well under way and we have developed a progressive return plan to our headquarters in Bouaké.

**Kanayo F. Nwanze**  
Director General

**Hope for a desert country: custom-made technologies revolutionize irrigated rice farming in Mauritania**

In a country where over 90% of the land is desert, where over a quarter of the population live below the poverty line of \$1 a day, a suite of improved technologies and decision-making tools is offering new choices to rice farmers and enhancing the productivity, profitability, and sustainability of irrigated rice farming.

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Scientists from WARDA and the national research and extension system in Mauritania, in partnership with local farmers, have shown that even a partial adoption of these technologies by irrigated rice farmers has resulted in 60% increase in farm yields and 85% increase in profits.

Just over 40 years ago, most of the people of Mauritania used to lead a quiet nomadic life. But recurrent droughts and the relentless advance of the desert have driven many people to leave their traditional way of life. The agricultural sector now employs about 65% of the labor force representing approximately 25% of GDP.

Rice is a staple food in Mauritania where the local cuisine is based on rice, lamb and goat. Paddy rice — grown almost exclusively on irrigated land in the fertile Senegal River Valley — has expanded considerably in recent years and now accounts for about 50% of cereal output. However, local rice production doesn't meet the country's demand, since yields are generally far below the potential.

WARDA researchers have discovered that the relatively low productivity of irrigated rice-based systems in Mauritania and in the other Sahelian countries of West Africa is partly because most research approaches assume that such environments are homogenous and have, therefore, developed 'one-size-fits-all' or uniform technologies.

"In fact, the Sahelian environment is very complex and the constraints and priorities within the same region vary considerably as do farmers' perceptions and knowledge base," explained Dr K Miezán, Leader of WARDA's Irrigated Rice Program. "Therefore, unless this variability is taken into account and farmers are integrated into the technology generation and adaptation process, they will reject the uniform technologies as these do not fit with their conditions," he added.

### Step-wise Integrated Crop Management (ICM) approach

Realizing that irrigated-rice farmers in West Africa need a wide palette of improved technologies from which to choose, combine and adapt to suit their specific conditions, WARDA and its partners used 'the step-wise or progressive ICM approach' that offers farmers ample flexibility and autonomy.

As part of this approach, a wide range of improved technologies that are still in the prototype phase are made available to farmers and are then adapted to the locally prevailing conditions through a progressive integration process, resulting ultimately in a basket or a comprehensive toolbox of ICM options for different types of irrigated rice-based systems.

The ICM basket includes options for improved fertilizer, weed, and water management, improved varieties and efficient post-



*Ensuring the relevance of R&D efforts through constant interactions with farmers and development actors.*

harvest technologies as well as decision-making tools, such as optimum sowing date, seeding and fertilizer rates and timing of fertilizer application, based on crop modeling research.

The ICM technologies are fine-tuned in farmers' fields, with a high degree of farmer involvement in the adaptation process. The technology that is of greatest interest to farmers and that addresses the major constraints is integrated first. Often the integration of one component requires the subsequent integration of complementary technologies, thus resulting in rapid adoption of improved technologies by farmers.

To ensure the success of ICM in the long term, WARDA is placing greater emphasis on the sustainable management of the natural resource

base, including maintenance of soil fertility, avoidance of salinity build-up, and biodiversity conservation.

### ICM impact in Mauritania

WARDA, in collaboration with various partners — the Centre national de recherche agronomique et de développement agricole (CNRADA), the Société nationale de développement rural (SONADER), the Association générale d'études techniques agricoles (AGETA), and farmers' organizations — has introduced the ICM approach with great success in the irrigated rice-based systems in Mauritania. The work has been supported by the World Bank, the Government of Mauritania, the Department for International Development (DFID), and the Japanese International Cooperation Agency (JICA).

Building on the success of its initial on-farm research with AGETA, a cooperative of relatively large-scale rice farmers, who were able to obtain yield increases of 1–2 tonnes per hectare from improved fertilizer and weed management, WARDA and its partners launched a 2-year project in 1999, to better understand the linkages between socioeconomic factors, farmers' choices of crop and resource management practices, and the productivity of irrigated rice systems.

While confirming that irrigated-rice farmers can significantly increase productivity by using improved ICM technologies, the results in the second year of the project showed that sample farmers could increase farm productivity by 60% and profitability by 85% by partial adoption of ICM components.

"The lessons learned from the Mauritanian ICM project will be valuable in adapting ICM to different irrigated rice production environments in West Africa", stated Dr Miezán. "With WARDA's increased attention to inland valley systems, the ICM system originally developed for high-input irrigated systems offers real opportunities for spillover to the low- to medium-input rainfed lowland systems," he added. ■

## At the center of the rice research and extension web in WCA: highlights from the ROCARIZ Network

An old African saying “When spider webs unite, they can tie up a lion” can be an apt description for the Réseau ouest et centre africain du riz (ROCARIZ), the West and Central Africa (WCA) Rice Network. ROCARIZ helps to join the separate threads of rice research and extension activities in WCA, transforming the linkages into a powerful technology delivery system.

“It takes many years to build institutional linkages, especially in Africa. However, ROCARIZ, which was created only in 2000, has made tremendous progress, building on the earlier successful Task Force mode of operation,” said Dr Sidi Sanyang, ROCARIZ Coordinator. “Today it is recognized as a unique rice research and extension model in WCA and active participation from NARS has increased by 30% since its creation.”

### The ROCARIZ vantage point

The vantage point of a network is quite different from that of a research center or an extension agency, and this difference gives the network a unique perspective on what technology or dissemination system will work and what won't:

- In all ROCARIZ projects, it has been confirmed that strong research and extension linkages and close involvement of farmers in technology generation and dissemination are key factors in the successful adoption of improved technologies.

- Since shortage of seeds of improved rice varieties remains the biggest bottleneck to rice development in the region, ROCARIZ recommends that credit systems should support farmers, so that they can become seed-production entrepreneurs. In Togo, for example, a farmers' group recently produced 37.4 tonnes of seed of 11 improved rice varieties thanks to a revolving credit system.

- ROCARIZ has revealed that opportunities for inter-country trade of seeds of improved rice varieties exist between Senegal and Mauritania and among The Gambia, Togo, Benin, and possibly, Ghana.

### Invaluable tool for rice research and extension

The value of the network was especially felt during the Ivoirian crisis, when the partnership-based activities of WARDA were kept alive outside Ivory Coast, thanks largely to ROCARIZ.

The monitoring tour conducted by ROCARIZ and its partners in Guinea in September 2002, which was accomplished despite the eruption of the Ivoirian crisis, revealed some interesting findings on the New Rice for Africa (NERICA):

- Among the seven NERICA varieties grown in Guinea,

NERICA 3 is the most widely cultivated variety growing in several ecologies. With yields averaging 2–3 tonnes per ha, NERICA 3 has gained popularity because of its short bold grain.

- Initiatives by individual farmers in NERICA seed production and distribution are significant factors in its dissemination and adoption in the country.

ROCARIZ has become an invaluable tool for rice research, serving both as a promoter of appropriate technologies as well as an early warning system for scientists by providing them instant feedback from farmers' fields.

For instance, finding segregating populations of *Oryza glaberrima* in Guinea in some farmers' fields of NERICA 3 after 3–4 years of cultivation, the monitoring tour urged breeders to eliminate this problem by applying cutting-edge science. It also exhorted the national program to become fully involved in the community-based seed production system and inject pure seeds every 2–3 years into the system.

### Enhancing research and extension capacity of NARS

As part of its activities, ROCARIZ strives to enhance the capacity of NARS, especially in advanced areas. In 2002, it conducted training programs for NARS participants in biotechnology and in 2003 in impact assessment. It has also reactivated the Visiting Fellow scheme for NARS.

ROCARIZ financed 95 small research-grant projects in 17 WCA countries for 2002–2003:

- Its support to a project in Burkina Faso has resulted in the development of three interspecific rice varieties suitable to the rainfed lowlands and irrigated ecologies. Similar work in the irrigated ecology of Mali also led to the selection of three promising lines that are tolerant/resistant to rice yellow mottle virus (RYMV).

- Its studies show that rock phosphate and legume cover crops tested in rotation or in association with rice significantly increased rice yield compared with the control.

- It supports the Rokupr Research Station in Sierra Leone, which is the lead NARS institution for research on mangrove rice in the sub-region.

ROCARIZ is currently supported by the United States Agency for International Development (USAID) and the European Union (EU) through the Conseil ouest et centre africain pour la recherche et le développement agricole (CORAF) / West and Central African Council for Agricultural Research and Development (WECARD) and is hosted by WARDA.■



ROCARIZ monitoring tour: seed multiplication of NERICA under community-based seed system.

## News and Notes

### Milestones



The 'Award Winner' ASI development team with the President of Senegal, Abdoulaye Wade (3rd from left), on the occasion of the Science Award Ceremony, Dakar, Senegal, 30 June 2003.



WARDA ICT Manager P Coulibaly (3rd row, 2nd from left), presented crisis management strategy for IT at the CGIAR IT Managers Meeting, 17–20 June 2003, CIMMYT, Mexico.



Dr G Guei, Head, Genetic Resources Unit, represented CGIAR at the Africa Economic Summit, Durban, South Africa, 11–13 June 2003.

### Workshops



Participants of the training course on Impact Assessment Methodology, Conakry, Guinea, 5–16 May 2003 organized by the ROCARIZ Rice Network. Twelve participants from Guinea, The Gambia, Gabon, Benin, and DR Congo attended.

Two training courses on Participatory Learning and Action Research (PLAR) for integrated rice management in inland valleys were conducted, 16–20 June 2003 in Sikasso, Mali and 23–27 June 2003, in Kumasi, Ghana. Twenty-five participants from Ivory Coast, Guinea, Mali and Senegal attended the first one, and 20 participants from The Gambia, Ghana and Nigeria attended the second.

### Partnership: key to the ASI success

In the irrigated rice systems of West Africa, threshing and cleaning are manually carried out mostly by women who spend hours on these back-breaking operations. This not only affects their health, but also the grain quality and profitability of rice.

The ADRAO/SAED/ISRA (ASI) thresher-cleaner was developed to address these problems. Based on a prototype from the International Rice Research Institute (IRRI), ASI has gone through several adaptations to match perfectly the Senegal River Valley conditions.

The partners in this successful venture are the Institut sénégalais de recherches agricoles (ISRA), the Société d'aménagement et d'exploitation des terres du delta du fleuve Sénégal (SAED), WARDA-Senegal, local manufacturers and farmers.

ASI has a threshing capacity of 6 tonnes of paddy rice per day (compared with 2 tonnes for Votex—the other widely used thresher) and grain-straw separation rate of 99%. It is not surprising, therefore, that over 100 ASIs have been constructed in Senegal since its official release and over 40% of the total paddy harvested in the Senegal River Valley is now threshed with ASI, making it the most widely used thresher in the area.

ASI's popularity has grown so rapidly that it has now spread to other countries in the region, and WARDA has been collaborating with partners in Mali, Mauritania, Ghana and Côte d'Ivoire to develop appropriate prototypes.

Please send your questions, comments or suggestions to:

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