

# cgjarNews

Nourishing the future through scientific excellence

March 2006

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### Promises Made and Kept: an Interview with Dr. Marilyn Warburton

Officially recognized 4 years ago as a "promising young scientist," Marilyn Warburton still works to help ensure that crop breeding makes good on its promise to alleviate poverty and hunger.

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### Business Unusual

Do public-private partnerships in agricultural research and innovation offer a new way to reduce poverty and improve food security in developing countries? Can the public and private sectors find common ground for a common good?

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### Transforming the Cassava Industry in Nigeria

The International Institute of Tropical Agriculture (IITA) is collaborating with national and international agencies to apply innovative technologies to develop the industrial use of cassava in Nigeria, transforming the tuber from a poor farmer's crop into an industrial one.

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### Groundnut Revolution Initiated in India

Improved groundnut variety ICGV 91114 from the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has initiated a revolution in the dry, rocky Anantapur District of Andhra Pradesh in India. The choosy farmers of the district are multiplying ICGV 91114 seeds with alacrity under an ICRISAT-initiated public-private seed partnership.

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### News from the Science Council Chair

A letter from Per Pinstrup-Andersen, Science Council Chair

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### Making Africa More Fruitful

The World Agroforestry Centre domesticates wild fruits trees in southern Africa

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### A Mountainous Success

Hidden among the hillsides of the southwestern Chinese province of Yunnan, a new green revolution is taking place as farmers and researchers prove that, despite long-held pessimism, upland rice farming can reap rewards.

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### African Dryland Farmers Benefit from Improved Crop Varieties

Many wonder if plant breeding can achieve much in the African drylands because the growing conditions there are so harsh. Historically, most breeding successes have occurred where water is ample, as for irrigated wheat and rice.

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### Strategic Partnership Combines Generation Challenge Program and Global Crop Diversity Trust

"Agricultural systems depend on plant genetic resources, the raw material for crop improvement, and on our ability to use these biological materials effectively," declares Cary Fowler, Executive Secretary of the Global Diversity Trust.

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### **Responding to HIV and AIDS in Africa's Fishery Sector**

Fishing communities have been identified as high-risk populations for HIV and AIDS, with the prevalence of infection among fisherfolk often 5-10 times higher than in the general population. An international workshop "Responding to HIV and AIDS in the Fishery Sector in Africa" took place on 21-22 February in Lusaka, Zambia, to address this dire development.

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### **Dietary Diversity Promoted for Better Nutrition**

In late November 2005, the International Plant Genetic Resources Institute (IPGRI) organized a meeting with the Ministry of Foreign Affairs of Italy and the Accademia delle Scienze, to promote the use of agricultural biodiversity in the fight against hunger, poverty and malnutrition.

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### **Wheat Improvement Program for Dry Areas**

During the meeting of the Board of Trustees of the International Maize and Wheat Improvement Center (CIMMYT) at the International Center for Agricultural Research in the Dry Areas (ICARDA), the two Centers agreed to jointly implement the ICARDA/CIMMYT Wheat Improvement Program (ICWIP) in the Central and West Asia and North Africa (CWANA) region.

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## Message from the Chairman and Director

Dear Colleagues:

Welcome to our first issue of e-CGIAR News produced exclusively in electronic format. Since we started producing an electronic version of CGIAR News in the html format in April 2003, we have heard back from you that this version is more useful than the printed newsletter. From now on we will only be producing an electronic newsletter and we look forward to your feedback.

We've also taken the opportunity to change the content of the newsletter. Each issue will include an up-close-and-personal interview with scientists at CGIAR Centers. In this issue we present the life and work of Dr. Marilyn Warburton, a molecular geneticist based at CIMMYT's headquarters in El Batan, Mexico. Dr. Warburton was the recipient of the CGIAR's Promising Young Scientist Award in 2002. Our new format also includes links to existing articles and stories on Center web sites which we hope will minimize duplication of information.

The United Nations has named 2006 the International Year of Deserts and Desertification. This presents a golden opportunity for the CGIAR to position itself and demonstrate how our research makes tangible improvements in the lives of hundreds of millions of people who farm drylands. The Marketing Group is assuming responsibility for this campaign.

We look ahead to several important meetings later this year including the Executive Council meeting on May 17-18 hosted by the Ministry of Foreign Affairs in the Hague, and AGM'06 in December to be held in Washington, D.C. More information on these meetings and others will follow.

The Center stories that follow pay tribute to the Membership while recounting the power of science to bring about positive change. While this newsletter includes references to donors who support specific projects, none of the CGIAR's achievements would be possible without the core support and commitment of the 64 members and many hundreds of partner organizations who together form the growing CGIAR alliance. We hope you will find this new design interesting and informative and, as always, we welcome your comments at [cgjar@cgiar.org](mailto:cgjar@cgiar.org).

Sincerely,

**Ian Johnson**  
CGIAR Chairman

**Francisco Reifschneider**  
CGIAR Director

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## Announcements

**Obituary: Guy Camus.** We are saddened to inform you that Guy Camus, TAC Chair 1982 – 1987, and former Board member of a number of CGIAR Centers, including CIMMYT and ISNAR, died January 2006.

**Norman Borlaug** was awarded the National Medal of Science by USA President George W. Bush on February 13, 2006. The award recognizes outstanding scientific achievement, and is the country's highest national award for science

**Adel El-Beltagy**, Director General of the International Center for Agricultural Research in the Dry Areas (ICARDA), has been elected Chair of the Global Forum on Agricultural Research (GFAR). In this capacity, he will provide leadership to GFAR and serve as a member of the CGIAR Executive Committee. Dr. El-Beltagy has also been elected a fellow of the Academy of Sciences for the Developing Countries in recognition of his contribution to science and its promotion in the developing world.

**Raj Paroda**, ICARDA regional coordinator for Central Asia and the Caucasus and head of the CGIAR Program Facilitation Unit, received in January the prestigious Norman E. Borlaug Award for 2005 from the President of India. The award, instituted by Coromandel Fertilizers, is named for the eminent CGIAR scientist and Nobel laureate.



Raj Paroda (right) receives award from the President of India.

**Mustapha El Bouhssini**, an ICARDA entomologist, has been appointed an adjunct faculty member in the Department of Entomology at Kansas State University in the US.





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## News and Views From the Alliance Chairs

As the Chairs of the Alliance Board (formerly the Center Board Chairs) and the Alliance Executive (formerly the Center Directors Committee), we can confirm that 2006 is off to an excellent start. The Alliance of Future Harvest Centers of the CGIAR continues to build on the progress made by our colleagues in cooperation with key partners over the past few years.

This year will see Centers continue to emphasize improving the efficiency and effectiveness of their work, individually and collectively. Special attention will continue to be devoted to planning joint programs and activities, expanding partnerships, and maximizing the efficiency by which resources provided by CGIAR Members are used.

To help promote and facilitate the planning and implementation of Centers' day-to-day collective activities, we have put in place the Future Harvest Alliance Office (FHAO) as an integral part of the CGIAR System Office. The FHAO began working in a decentralized, virtual mode in 2004 with two part-time staffers. We are pleased to share with you the first annual report of the work accomplished by this office. [Click here to read the report.](#)

It has become increasingly apparent, however, that the level of backstopping and support that this arrangement can provide is insufficient to meet the collective needs of the Centers. The decision was thus made last year to establish an office generously hosted by the International Fund for Agricultural Development (IFAD) in Rome. We are pleased to report after an extensive international search, Dr. Anne-Marie Izac will begin work as the full-time Chief Alliance Officer for the FHAO, beginning this month. For more information about Dr. Izac and the collective work of the Centers, please see the [March 2006 FHAO Newsletter](#).

Members of the Alliance Board and Executive will join special guests at the International Center for Tropical Agricultural (CIAT by its Spanish acronym) for a two-day meeting on 26-27 April to advance several important issues on the Centers' agendas. These include

- the research for development continuum,
- global public goods,
- sub-Saharan medium-term plans,
- climate change,
- agriculture and health,
- high-value goods for the poor,
- funding the new CGIAR research priorities, and
- performance assessment.

We look forward to reporting on continued progress in the months to come.

Jim Godfrey  
Alliance Board Chair

Joachim Voss  
Alliance Executive Chair





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## Promises Made and Kept: an Interview with Dr. Marilyn Warburton

*We are pleased to bring you the first in our new series of interviews with CGIAR Scientists, exploring the life and work of Dr. Marilyn Warburton, Molecular Geneticist at CIMMYT, and recipient of the CGIAR Promising Young Scientist Award in 2002. In this article, we explore the work Dr. Warburton has undertaken on her journey from Tuscon to El Batan, and her hopes for the future.*

Officially recognized 4 years ago as a "promising young scientist," Marilyn Warburton still works to help ensure that crop breeding makes good on its promise to alleviate poverty and hunger

Receiving the Promising Young Scientist Award for her work on crop genetic diversity had an effect on Marilyn Warburton that was ... well, diverse.

"It was intimidating," confesses the American molecular geneticist at the International Maize and Wheat Improvement Center (CIMMYT), who was 34 when she received the award in 2002. "I felt that I had to live up to that promise. At the same time, it was hugely flattering — verification that people thought what I was doing was important. I guess you could say it was motivating."



Dr. Warburton's list of recent papers in peer-reviewed publications certainly indicates a motivated scientist. She had five published in 2004 and seven in 2005. Less than 2 months into 2006, she had three papers published and another two in press.

"I wasn't first author on all of them," she hastens to add. "But I was for two of them each year. I think that's a good target."

The CGIAR Promising Young Scientist Award recognized Dr. Warburton for developing a fast, inexpensive way to accurately analyze genetic diversity in maize and wheat using molecular characterization. This development helps plant breeders use that diversity to improve cultivars' pest and disease resistance, boosting the value and reliability of harvests in normal years and promising to help make catastrophic crop failure a thing of the past.

The danger of depending on crops with narrow genetic bases was dramatically demonstrated in the Great Irish Famine of 1845-47, when an epidemic of potato late blight wiped out the island's entire potato crop. Nearly 3 million people, or a third of the population, either starved or emigrated. Yet the lesson went largely unlearned, and the genetic bases of crops continued to narrow.

"What really focused crop scientists' attention on the problem was the southern corn leaf blight that hit the US in 1970," relates Dr. Warburton. "A large part of the US maize crop was susceptible to this one disease."

Landraces, or early forms of crop species, typically have less genetic diversity than their wild cousins. One reason is the genetic bottleneck caused by descent from only a few individual plants whose spontaneous hybridization or mutation made them attractive to farmers. Farmer selection for agronomic traits further reduces diversity, and this process accelerated in the early years of modern crop improvement.

The diversity of wheat improved by CIMMYT dropped well below that of wheat landraces in the middle of the 20th century, then held steady as CIMMYT began to use more diverse breeding materials from around the world. The last decade has seen a dramatic return of CIMMYT varieties' genetic diversity to a level comparable with that of landraces. This has come about through the contributions of so-called synthetic wheat. Molecular breeders create these new wheat types by crossing two wild relatives of wheat to create the tetraploid (doubled) genome of durum wheat, adding a third wild species to create the hexaploid (tripled) genome of bread wheat. Synthesized wheat lines cross easily with popular cultivars, bringing to them a wealth of newly harnessed genetic diversity.

"Basically breeders reenact in the lab the crosses that originally created wheat, which happened only once in nature," Dr. Warburton explains. "Each time they synthesize wheat in the lab, they greatly expand the gene pool."

Citing the stem rust fungus that emerged in Uganda in 1999 as the worst threat facing wheat farmers today, the molecular geneticist is hopeful that breeding programs now have materials diverse enough to create and deploy resistant wheat cultivars in time to stop the epidemic.

"Like other advances, restoring diversity without sacrificing agronomic traits owes everything to teams of scientists working together," she stresses. "Nothing happens in isolation. Progress depends on everyone contributing."

Cataloging wheat genetic diversity contributes by telling breeders where to find useful diversity, despite complications arising from the unwieldy size of the wheat genome. Maize poses a different problem, as it outcrosses to create heterogeneous populations. Determining the relatedness of two populations depends on first defining an average for each. Dr. Warburton and her colleagues have simplified the process.

"We randomly choose 15 individuals from a given population of maize and treat it as a single sample," she explains. "In theory, those 15 individuals can contain 30 alleles of each gene, two from each individual. The computer program we wrote at CIMMYT allows us determine the frequencies of the various alleles in the sample and deconstruct it to calculate how many individuals have each allele. This defines the population. Our method lets us look at hundreds of populations cost effectively."

Dr. Warburton and her colleagues nevertheless have their work cut out for them categorizing the huge wheat and maize germplasm collection at CIMMYT. Progress so far has polished the Center's reputation for cataloging germplasm, attracting eager collaborators. Dr. Warburton recently worked with the Seed and Plant Improvement Institute of Iran to determine the relationships among early maturing Iranian lines of inbred maize, for which pedigree information is usually lacking, despite the crop's relatively recent introduction into the country.

Another recent project explored the genetic diversity and relationships of wheat landraces in Oman, where the crop has been grown for more than 3,000 years. Results suggest that wheat populations that were once widespread in India, Iran and Pakistan have been conserved in the remote mountain oases of this isolated land on the eastern tip of Arabia.

Raised in the similarly arid but less exotic environs of Tucson, Arizona, Marilyn Louise Warburton kept lots of pets as a child and was active in 4-H, an agriculture- and outdoors-oriented youth organization. Science was her favorite school subject, so naturally she started out at the University of Arizona majoring in veterinary science.

"After my first undergraduate genetics class, I knew this was what I wanted to do," she recalls. "But I switched to plants when my advisor told me there were too many vets."

Having earned her BS and MS in Tucson, she went to the University of California at Davis for a PhD in plant genetics. She continued at Davis as a post-doc fine-mapping tomatoes, moved to Illinois to work on crop diversity at the National Soybean Germplasm Repository, and turned to maize and wheat on arrival at CIMMYT's Applied Biotechnology Center in 1998.

"It isn't difficult to switch crops," she notes, "but now I'm going into a different area of research."

With a fellowship commemorating CGIAR cofounder Frosty Hill, Dr. Warburton is currently on sabbatical at Cornell University, expanding her range of expertise to include association mapping. "Many of the tools are the same as in what I was doing, but the analysis is different," she observes. "Association mapping looks at diversity that causes specific traits and asks why some varieties are better at certain things than other varieties."

A separate challenge facing Dr. Warburton is how to balance a heavy workload with the demands of parenthood. Now separated from her husband, she brought her two sons, aged 2 and 6, to Cornell for her year-long sabbatical. However, during most of her travels away from CIMMYT's research campus near Mexico City, she depends on her in-laws, who live nearby, to keep the kids.

"You need strong family support in this line of work, because you travel so much," she says. "Without them, I don't know how I'd manage."



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## Business Unusual

Do public-private partnerships in agricultural research and innovation offer a new way to reduce poverty and improve food security in developing countries? Can the public and private sectors find common ground for a common good?

To answer these questions, the International Food Policy Research Institute (IFPRI) has brought together key decision-makers, policy experts and private sector representatives. Over the past year, IFPRI convened a series of meetings around the world to explore how public-private partnerships can contribute to food security, poverty reduction and economic growth in developing countries. Workshops and conferences were held in New Delhi (in collaboration with the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT)), Nairobi (in collaboration with the International Maize and Wheat Improvement Center (CIMMYT)), Nicaragua and Bolivia, to explore the challenges and opportunities of public-private partnerships and strengthen capacity for developing these collaborations. An international dialogue took place in Washington, DC, to discuss these country-specific experiences.

These dialogues coincide with increased private sector interest in developing country markets, rapidly growing private investments in agricultural research, and the advent of new technologies. At the same time, progress toward meeting the Millennium Development Goals is faltering, particularly for issues related to agriculture. Forging partnerships and collaboration across sectors in agricultural research and development could help reverse this trend.

Participants at these events contended that the rapidly changing global food and agricultural system — the commercialization of smallholder agriculture, for example, and the growing emphasis on markets and market regulation — demands new strategies and behavior from poor farmers in developing countries. Smallholders increasingly bear the brunt of change while hampered by limited access to new knowledge and technologies, weak bargaining power in global supply chains, and minimal input into policymaking processes. Public organizations, private firms and civil society can help bring smallholders into the global system as equal partners.

Participants were quick to illustrate these principles with examples of partnerships that have benefited smallholders by focusing on knowledge sharing, joint learning, resource pooling or risk sharing. Examples include

- germplasm exchanges to promote breeding,
- multiplying and distributing improved crop varieties,
- partnerships to commercialize and distribute post-harvest technologies, and
- collaborations designed to develop entire value chains.

Participants cautioned that public-private partnerships, while promising, are not a panacea for the many development challenges facing smallholders. More analysis is required to determine how cross-sectoral barriers to partnerships can be overcome, how policies and regulations can foster greater partnership, and how these partnerships can be better organized and managed.

IFPRI, in collaboration with the CGIAR System and many of its Centers, intends to answer these questions and help unleash the positive potential of pro-poor public-private partnerships. With cooperation and investment, these efforts may yield tangible results for the poor.

Please see the following stories submitted by ICRISAT and IITA highlighting successful public/private partnerships.



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## Transforming the Cassava Industry in Nigeria

The International Institute of Tropical Agriculture (IITA) is collaborating with national and international agencies to apply innovative technologies to develop the industrial use of cassava in Nigeria, transforming the tuber from a poor farmer's crop into an industrial one.

An example of a successful public-private partnership in research for development, the IITA cassava project is sponsored by the federal government of Nigeria, Shell Petroleum Development Company, Niger Delta Development Commission, and the United States Agency for International Development. The project's two components are the Cassava Mosaic Disease (CMD) Pre-emptive Project, which breeds and distributes improved cassava varieties resistant to the virulent Ugandan variant of the CMD, and the Cassava Enterprise Development Project, which seeks to promote the development of enterprises that process and use cassava. Under the current implementation program, the IITA Integrated Cassava Project (ICP) has emerged as a mega project guiding cassava's transformation.



Bakers, as well as farmers.

Speaking recently during an open forum in Abuja — where Nigerian President Olusegun Obasanjo chaired a meeting of all stakeholders including bankers, farmers, entrepreneurs and other government representatives — Lateef Sanni, IITA food technologist and postharvest specialist, reported that IITA has been facilitating implementation of the federal government's policy, which came into effect at the beginning of 2005, to derive 10% of bread flour from cassava. To ensure the success of the policy, IITA has involved in its implementation other stakeholders, especially the Standards Organization of Nigeria (SON); National Agency for Food, Drug Administration and Control (NAFDAC); Flour Millers Association; and Master

Bakers, as well as farmers. Dr. Sanni reports that implementation has encouraged fast-track approaches toward developing high-capacity, user-friendly postharvest equipment for processing cassava into industrial products. For instance, IITA has encouraged the local manufacture of processing equipment including flash, cabinet and rotary dryers, as well as hydraulic presses, automated sieves and graters to enhance the in-country production of high-quality cassava flour. In preparation for implementation early last year, IITA collaborated with the Office of the Special Assistant to the President on Food Security to hold sensitization workshops in 28 Nigerian states. The participants — mainly food processors, caterers and bakers — were taught how to produce high-quality cassava flour to meet increasing demand.



incorporated from the beginning.

The ICP has also encouraged the formation and strengthening of the Cassava Growers Association, Cassava Processors Association, and Cassava Equipment Fabricators Association to serve as platforms for private sector participation. IITA has been building micro- and medium-sized cassava processing centers and training rural women to manage them profitably. Cassava farmers are organized in clusters around the processing centers to better enable them sell their fresh tubers at competitive prices. Some of the finished products are packaged in well-labeled polythene bags of 1 kilogram or more for export, while others are sold in Nigerian supermarkets. As the emphasis is on high-quality products, inputs from the SON and NAFDAC were

Realizing that production holds the key to the cassava industry's success, IITA has developed, in collaboration with national partners, about 40 high-yielding CMD-resistant cassava varieties adapted

to various ecological zones.



*Bleached and unbleached syrup from cassava*



*Women at coop peeling cassava*

The ICP has developed a reliable Market Information System on 20 major staples that is updated weekly on the cassava business website at [www.cassavabiz.org](http://www.cassavabiz.org) and in major national newspapers and radio and television broadcasts. Prices covering 70 markets (30 urban and 40 rural) are often collected at farm and factory gates.

More generally, IITA executes the cassava initiative of the New Partnership for African Development, which identifies cassava as a poverty fighter in sub-Saharan Africa. For additional information, contact Dr. Lateef Sanni ( [lsanni@cgiar.org](mailto:lsanni@cgiar.org)) or Taye Babaleye, IITA head of public affairs ( [t.babaleye@cgiar.org](mailto:t.babaleye@cgiar.org)).

**Photos: IITA**



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## Groundnut Revolution in India

Groundnut grows where other crops fail. When farmers in a tough terrain select a groundnut variety, they know what is best for their needs.

Improved groundnut variety ICGV 91114 from the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has initiated a revolution in the dry, rocky Anantapur District of Andhra Pradesh in India. The choosy farmers of the district are multiplying ICGV 91114 seeds with alacrity under an ICRISAT-initiated public-private seed partnership.

ICRISAT has helped design an end-to-end solution to improve the groundnut variety in Anantapur, reports William D. Dar, Director General of ICRISAT: "We have blended our scientific excellence with the strengths of our partners to improve the productivity of the farmers working in a difficult environment."

Situated in the southern part of Andhra Pradesh, Anantapur is known for groundnut cultivation. Farmers there prefer groundnut as it survives on rough terrain under uncertain rainfall. Though the average rainfall is around 550 mm per year, some parts of the district have recorded rainfall as low as 200 mm in bad years and as high as 900 mm in good years.



Farmers typically grow groundnut on 800,000 hectares of the district, but in good years the area can rise to 1 million hectares, covering nearly 70% of the cultivated area in the district and making groundnut cultivation a pillar of strength for the rural economy. The crop can withstand dry spells of up to 50 days. When the rain returns, the crop rises phoenix-like from under the gravelly soil, yielding nuts for market and fodder for farmers' animals.



Shyam N. Nigam, principal groundnut breeder at ICRISAT, reports that farmers in Anantapur have changed their cropping pattern over the decades due to poor rains, prolonged dry spells and frequent crop failures. "About 45 years ago, it used to be 80% cereals and 20% groundnut," Dr. Nigam says. "Today it's 80% groundnut and 20% other crops."

Not only is the choice of crop limited, so is the choice of variety within the crop. Since the 1940s, farmers have continued to plant TMV 2, though improved varieties have been available. Farmers felt that the improved varieties selected for propagation in peninsular India did not meet the specific needs of their district.

ICRISAT started the process in the reverse. The groundnut breeding team from the Institute worked with farmers to select the most suitable varieties. With financial support from the International Fund for Agricultural Development, the project began in 2002 rainy season in the fields of 10 farmers who volunteered to participate. Ten new varieties were grown alongside TMV 2 in Dhanduvaripalli and Rekulakunta villages. The other partners in the project were the Acharya NG Ranga Agricultural Research University and the nongovernmental organization Rural Development Trust.

After the first harvest, the search for new improved varieties was narrowed to two: ICGV 91114 and ICGV 89104. During the next rainy season in 2003, the selected varieties were grown in slightly larger plots in West Narsapuram and Rekulakunta villages. The severe drought that year put all the varieties to the test, and ICGV 91114 produced a significantly higher pod yield, haulm (stem or top part of the plant) and shelling turnover (the ratio of seed weight over the total weight of seeds and shells) than ICGV 89104 and TMV 2.

"Under such severe conditions, any increase in productivity is of great benefit to the farmers," comments Dr. Nigam. And, as the farmers were involved in all stages of varietal selection, they more readily accepted the improved variety. The trials and the seed-multiplication program for ICGV 91114 picked up from the first year onwards.

**Photos: ICRISAT**



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## News from the Science Council Chair

Now that we have agreement on the System research priorities for CGIAR for the next 10 years, we need to move to implementation. The consensus on an implementation process at the Annual General Meeting 2005 was an important step. The various stakeholder groups not only have a role to play in this process, their active participation is vital to the success of the effort. Without an appropriate strategy and follow-on action, the work to develop the system priorities will be wasted.

The Science Council is ready to do its part. On the basis of the medium-term plans that will be prepared by the Centers and Challenge Programs, we will collaborate with the Centers and the Alliance to assess how closely the current and proposed research activities and plans align with what is visualized in the System priorities. We will identify gaps as well as plans and activities that fall outside the System priorities and assess where on the research-development continuum each priority should be. We will recommend adjustments in the research portfolio to be undertaken during the 3-year adjustment period. Finally, we will combine all of this into a strategic perspective for future direction for the CGIAR research program. We will work with the ad hoc committee of the Executive Council that is being formed to facilitate the implementation of the strategy through appropriate organizational and funding arrangements.

To help assure that the most appropriate vehicles for research implementation are identified, we will review the objectives and content of existing System-wide and inter-Center programs — and the lessons learned — as well as current and proposed Challenge Programs. We will explore new modes of operation. A truly cohesive research program designed to achieve the goals of a particular system priority will require close collaboration across Centers and, most likely, also with institutions and individuals outside the CGIAR. Such collaboration is needed throughout the research, from initial planning to disseminating results. We must make the whole bigger than the sum of its part. This means that Center-specific research projects addressing a particular topic or priority are more likely to be effective in reducing poverty if guided by a common framework and goal than if done in isolation. The challenge is to get cohesion across Centers for each system priority at reasonable transaction costs, which is compatible with Center sovereignty and funding structure. Experiences with existing Challenge Programs and System-wide programs, as well as experiences from institutions outside the CGIAR, provide a starting point for the deliberations.

**Per Pinstrup-Andersen**  
Science Council Chair



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## Making Africa More Fruitful: The World Agroforestry Centre Domesticates Wild Fruit Trees in Southern Africa

Vitex jam, strychnos or syzgium juice, and mazhanje jelly. Despite the exotic names, these are not the latest food creations resulting from genetic modification. Rather, they are new products from the fruit of trees indigenous to the Miombo woodlands of southern Africa. The World Agroforestry Centre has been working with farmwomen in the region to help market their fruit tree products.

For the full story, please [click here](#).



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## A Mountainous Success

Hidden among the hillsides of the southwestern Chinese province of Yunnan, a new green revolution is taking place as farmers and researchers prove that, despite long-held pessimism, upland rice farming can reap rewards. A new cropping system that incorporates new rice varieties bred for the upland environment, and which produce more rice on less land, has already lifted thousands of people out of poverty. As slash-and-burn agriculture becomes a thing of the past in Yunnan, some of the steepest mountainous areas is being returned to forest. The new system is now set for introduction into similar environments beyond Yunnan, where it has the potential to transform upland agriculture in Cambodia, Laos, Myanmar and Thailand.

For the full story, please [click here](#).



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## African Dryland Farmers Benefit from Improved Crop Varieties

Many wonder if plant breeding can achieve much in the African drylands because the growing conditions there are so harsh. Historically, most breeding successes have occurred where water is ample, as for irrigated wheat and rice.

But too many lives are at stake to shun the challenge. In 1972 the CGIAR created the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), which has since worked closely with national partners across the developing world to improve and disseminate the dryland cereal crops sorghum and millet and the legume crops chickpea, groundnut (also called peanut) and pigeonpea.



As a result, farmers now grow improved varieties on about a million hectares across Africa. Particularly remarkable are the adoption rates across southern Africa for improved millet (34%) and sorghum (23%). Also with high adoption rates are sorghum in southern Chad and adjacent parts of Cameroon (30%), millet in Namibia and Zimbabwe (50% or more), and pigeonpea in the Babati district of Tanzania (35% or more).

Seasonal hunger, as occurred in Niger in 2005, is a perennial plague of the drylands, which have only one short cropping season per year. Plant breeding has helped ease the hungry period by developing varieties that mature weeks or even months sooner than traditional varieties. Not only does this put food in hungry bellies, but farmers of early maturing varieties benefit by getting the year's highest prices. Another crucial advantage of early maturity is that it reduces farmers' risk in years when rains end early.

The millet variety Okashana 1 in Namibia, selected largely by farmers themselves, matures 4-6 weeks earlier than previous varieties. It was so popular that it spread in just a few years in the late 1990s to cover half of the country's millet-growing area. The sorghum variety Macia is currently spreading across East Africa for the same reason.

Some of the largest dryland breeding gains have come from developing resistance to devastating diseases. The wilt-resistant pigeonpea variety Mali is now saving the livelihoods of East African dryland farmers, and resistance to groundnut rosette virus, a scourge that the native Hausa people of Nigeria tellingly call "groundnut leprosy," is raising hopes for a revival of this huge income-earning crop.

Studies of return on investment suggest that the effort has been well worth it. The \$3 million effort to create and disseminate Okashana 1, for example, is returning net annual benefits worth 50% of the investment year after year. This rate of return that far outstrips what can be earned from bank deposits or the stock market, while directly helping society's poorest. Of course, cash value is only one measure of

success, dwarfed by the priceless good of alleviating human suffering.

Photo: ICRISAT



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CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH



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## Strategic Partnership Combines Generation Challenge Program and Global Crop Diversity Trust

"Agricultural systems depend on plant genetic resources, the raw material for crop improvement, and on our ability to use these biological materials effectively," declares Cary Fowler, Executive Secretary of the Global Diversity Trust. To achieve maximum impact, the Trust and the Generation Challenge Program work together to align the Trust's strategy of ensuring the continued conservation of genetic resources with Generation's systematic approach to unlocking their potential to tackle the world's most daunting problems.

Read all about it in : **Both Sides of the Coin**, an item in Generation's recently released, first annual **Research Highlights**.



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## Responding to HIV and AIDS in Africa's Fishery Sector

Fishing communities have been identified as high-risk populations for HIV and AIDS, with the prevalence of infection among fisherfolk often 5-10 times higher than in the general population. An international workshop "Responding to HIV and AIDS in the Fishery Sector in Africa" took place on 21-22 February in Lusaka, Zambia, to address this dire development.

Stephen Hall, director of the WorldFish Center, warned that, if the fisheries sector was to deliver any economic benefits for African countries, HIV/AIDS had to be addressed. "The situation now is that both the resource and the people who supply it are under threat," Dr. Hall said at the workshop. "The situation is getting worse."

The high mobility and risky lifestyle of fishermen is seen contributing to high HIV prevalence rates in some contexts. Janet Seeley of the University of East Anglia explained that boat crew members are typically young men between the ages 15 and 35, often working in an environment that values risk-taking. Transient community structures, a lack of health services, gender inequality and the low social status of fisherfolk further contribute to their vulnerability.

Government agencies, civil society and the private sector have addressed the problem at various levels, from policy to promoting community development, their work supported by research into contributing social, economic and health factors. The purpose of the workshop was to assess progress made in responding to HIV and AIDS in the fishery sector in Africa and to identify priorities for further research and development support.

Co-hosted by the National AIDS Council of Zambia and the Department of Fisheries of the Zambian Ministry of Agriculture, the event attracted over 100 participants, including technical experts from regional and international research and development organizations and representatives from 13 African countries. Among those present was the coordinator of the CGIAR Systemwide Initiative on HIV/AIDS and Agriculture, through which the CGIAR aims to deploy agricultural research to mitigate the impact of HIV/AIDS on food security, nutrition and economic development.

The workshop was organized by the WorldFish Center, the International Organization for Migration, and Food and Agriculture Organization of the United Nations, with support from the Swedish International Development Agency.

Raising awareness of the different responses to HIV and AIDS in fishing communities and the wider fishery sector in Africa, the workshop advanced a common understanding of what needs to be done next and how stakeholders can work together to make it happen. Workshop recommendations will be followed up through research programs at the country and sub-regional levels, and linkages will be sought with activities in other economic sectors. The workshop also kick-started a regional network of researchers and development practitioners working on responding to HIV and AIDS in the fishery sector.

Workshop outputs will provide important guidance on how this support can be extended. For further information and outputs, email enquires can be addressed to [Lusaka2006@worldfish-eg.org](mailto:Lusaka2006@worldfish-eg.org).



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## Dietary Diversity Promoted for Better Nutrition

In late November 2005, the International Plant Genetic Resources Institute (IPGRI) organized a meeting with the Ministry of Foreign Affairs of Italy and the Accademia delle Scienze, to promote the use of agricultural biodiversity in the fight against hunger, poverty and malnutrition. The meeting, which took place in the National Library in Rome, was part of the Ministry's Days of Cooperation, an annual celebration of Italy's support for development.

Dignitaries from the Italian government, scientists and permanent representatives to United Nations agencies heard IPGRI Director General Emile Frison explain the multiple benefits that make the neglect of agricultural biodiversity by policymakers and health specialists worrying.

"We know enough from preliminary studies to say that a diverse diet is perhaps the most effective way to treat malnutrition, especially the hidden hunger of missing micronutrients," Dr. Frison said. "Agricultural biodiversity feeds into a diverse diet, with obvious benefits for health and livelihoods." Dr. Frison added that using local and indigenous crops and varieties is also environmentally friendly and sustainable, and other speakers supported that view.

Foreign Minister Eugenio Campo recalled that IPGRI's global program on nutrition and underutilized species grew out of an Italian-funded project on neglected species of the Mediterranean. Barbara Burlingame, senior nutrition officer of the Food and Agriculture Organization (FAO) of the United Nations, and Martin Bloem, chief of the Nutrition Service of the World Food Program, agreed that dietary diversity was an important component of good nutrition. For the World Health Organization, Chizuru Nishida lent weight to prevailing ideas that malnutrition — in the form of hidden hunger and simplified diets — was a leading cause of ill health in the developing world. She said that the double burden of malnutrition and diseases usually associated with affluence, such as type 2 diabetes, obesity and heart disease, could be tackled only by improving diets.

The Rome meeting was part of an ongoing process of bringing the benefits of dietary diversity to the attention of those outside the agricultural sector. In February, IPGRI hosted a stakeholder meeting to further agree on concrete actions to advance the use of diversity for nutrition. This follows a decision by the 7th Conference of the Parties to the Convention on Biological Diversity 2 years ago to ask IPGRI and FAO to help the Convention Secretariat draw up a cross-cutting initiative on agricultural biodiversity and nutrition.

"The next step is take the outcomes of the stakeholder meeting as a contribution to the deliberations of the 8th Conference of the Parties in Brazil in March," said Dr. Frison. "We need to increase awareness of the value of agricultural biodiversity if we are to stand any chance of meeting the Millennium Development Goals."



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## Wheat Improvement Program for Dry Areas

During the meeting of the Board of Trustees of the International Maize and Wheat Improvement Center (CIMMYT) at the International Center for Agricultural Research in the Dry Areas (ICARDA), the two Centers agreed to jointly implement the ICARDA/CIMMYT Wheat Improvement Program (ICWIP) in the Central and West Asia and North Africa (CWANA) region. ICWIP will be hosted in CWANA by ICARDA, which has its headquarters in Aleppo, Syria, and will include all research undertaken on wheat improvement in CWANA by both Centers, covering durum wheat and spring, facultative, and winter bread wheat. The Centers also agreed that the program should be managed by a jointly appointed director. As the first major outcome of the new agreement, which was officially signed at the Annual General Meeting of the CGIAR in December 2005, the two Centers have named Sanjaya Rajaram as Director of the new program.

Dr. Rajaram joined ICARDA in early 2005 as director of the newly formed megaproject Integrated Gene Management (MP2), which includes wheat improvement, after having worked as a wheat scientist at CIMMYT for 34 years. His association with ICARDA goes back to the 1980s, however, when a joint CIMMYT/ICARDA program was established at ICARDA. He also directed the CIMMYT staff posted at ICARDA in the joint program while he served at CIMMYT in Mexico.

ICARDA and CIMMYT are confident that Dr. Rajaram's efforts will promote effective delivery of useful products to partners and, given his experience in wheat research and familiarity with both Centers, will both foster and make good use of the many synergies between the ICARDA and CIMMYT research teams.

For more information please contact Dr. Sanjaya Rajaram ([s.rajaram@cgiar.org](mailto:s.rajaram@cgiar.org)). Media contacts are

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Surendra Varma at ICARDA ([s.varma@cgiar.org](mailto:s.varma@cgiar.org), tel 963-21 2213433, 963-94517251).



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