



SATrends Issue 1

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Foreword

Dear Friends of ICRISAT and the Semi-Arid Tropics,

It is my privilege to introduce you our new monthly e-newsletter, **SATrends**. It will brief you on progress in sustainable development of the semi-arid tropics (SAT). We know you're busy so we've kept them concise, less than a page each.



We're particularly thrilled that this **inaugural edition** is being launched by the Honorable Chief Minister of the State of Andhra Pradesh, India, Shri N. Chandrababu Naidu (*with beard*) – a true believer in the power that information technology holds to transform the world.

Shri Chandrababu Naidu has attracted world attention for his vision and action to stimulate the growth of the information technology industry in India. He has also championed its use for more transparent and effective government.

It was his leadership, innovation, energy, and optimism that attracted US President Bill Clinton to visit Hyderabad, the capital of Andhra Pradesh, during his India visit in March.

For this inaugural launch, we are sending SATrends to our partners and alumni within both the

developing and developed world. It is a large group, and undoubtedly we have overlooked a number of good friends in different corners of the globe. Please help us grow the list by forwarding it to others you think may be interested in mankind's adventure for the sustainable development of the dry tropics.

William D. Dar
Director General, ICRISAT

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1. Exciting options for people-centered development were brainstormed at an [International Symposium on Semi-Arid Tropical Futures](#).

"Agriculture can become the engine of economic growth that helps propel the rural population out of poverty", said Dr. James G. Ryan, a distinguished international economist and world authority on agriculture in the SAT as well as a former Director General of ICRISAT, presenting a seminal paper co-developed with Dr. Dunstan S. C. Spencer.

Dr. Ryan emphasized that if nothing is done, poverty rates will continue to be highest in rural areas. He cited a recent study by the Asian Development Bank, which has found that investments in agricultural development in rainfed areas in Asia (such as the SAT) are more effective in reducing poverty than investments in more favorable areas.

But he cautioned that the staple food crops of the poor in dry areas are losing economic importance in Asia as they are being replaced by rice and wheat. To help the poor escape poverty, researchers need to broaden their agenda to include high-value crops – and livestock, which will be of increasing importance as demand for meat and milk increases rapidly in the coming decades. This creates a key opportunity for the dry tropics, which is well suited for livestock production, and for the use of crop materials as livestock feed.

Dr. V. Kurien – the inspiration behind the White (dairy) Revolution in India based on a farmers' cooperative model – placed the farmer front-and-center, saying that "Only when we, as scientists, look at the world from farmers' perspective in a holistic manner by removing the blindfold imposed by our narrow disciplinary training and experiences, will we be able to make a difference in the lives of farmers living in semi-arid areas."

Ms. Victoria Sekitoleko, Sub Regional Representative for Southern and Eastern Africa, FAO, Harare, recounted her knowledge and experience of the agricultural situation in Africa, highlighting the critical role of education and good governance for real impact on farmers.

Dr. Jock R. Anderson, Advisor, Rural Development Strategy and Policy, World Bank, Washington DC, emphasized that farmers living on few resources are skilled in managing risks and exploiting transient opportunities. Researchers need to view risk through the farmers' eyes – as a major determinant of their decisions – if they are to develop appropriate and adoptable technologies.

In related seminars, Dr. William D. Dar, Director General of ICRISAT, advocated the vision of a 'Grey-to-Green Revolution', converting the dry (grey) areas into productive agricultural zones. Noting that the dry areas of the USA, Australia, Europe, and Asia are their breadbasket zones. Dr. Dar urged a change of perception about the SAT, which are associated in the public mind with hopelessness and starvation. "By making more efficient use of soil and water resources – for example, by harvesting and storing water on the farm, and by growing quick-maturing crops on the remaining moisture after the main crop is harvested – these areas can bring new hope and prosperity to the poor," he said.

Held on 14 November at ICRISAT-Patancheru near Hyderabad, India, the Symposium was the culmination of a series of Brainstorming Sessions on SAT Futures held at ICRISAT's Africa research hubs: Bamako (Mali), Bulawayo (Zimbabwe), and Nairobi (Kenya). Top national research leaders as well as experts from non-governmental organizations, the private sector, and farmers' groups participated in the broad dialogue.

The objective is to develop a long-term vision and strategy to ensure that research addresses the needs that will be paramount in the next two decades.

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2. International Centers team up to help war-torn **East Timor** rehabilitate its agriculture.

“A focused project and one of the first international relief efforts of its kind in Asia” is how Dr. S.N. Nigam, ICRISAT Groundnut Scientist described the “Seeds of Life” initiative, which is designed, managed and funded by the Australian Centre for International Agricultural Research (ACIAR) as a special activity in collaboration with the East Timor administration. A number of sister Centers of the Consultative Group on International Agricultural Research (CGIAR) have teamed up in this initiative to help East Timor restore its agricultural sector.

Farming in the country is on the road to recovery, but conditions are still dire for many. People in the countryside are subsisting on roots and tubers and farmers are desperately in need of seeds of food crops for the next season.

ICRISAT has been entrusted with the responsibility of introducing high-yielding groundnut varieties adapted to the diverse growing conditions of East Timor.

Representing ICRISAT, Mr. D. Yadagiri took 80 kilograms of several varieties of groundnut seed to East Timor. Together with other participants of the project, he organized multilocation trials to test their suitability. These trials will be supervised by Dr. Brian Palmer, Agriculture Advisor, National Council for Resistance in East Timor.



The President of East Timor, Mr. Jose Alexandre Gusmao Xanana formally launched the project.

The other participants in this project are our sister CGIAR Centers IRRI, CIMMYT, CIAT, and CIP, and the organizations CNRT, UNTAET, World Vision, and Catholic Relief Services.

Back row (standing L to R) - Clodagh McCumiskey (Team Leader, Catholic Relief Services), Fernando Gonzalez

(maize breeder, CIMMYT), Patrick Kapuka (agronomist, World Vision), Brian Palmer (ACIAR project leader and agricultural adviser to Conselho Nacional da Resistencia Timorese), Xanana Gusmao (President, CNRT), Colin Piggin (ACIAR project coordinator), Damarsetti Yadagiri (peanut breeder, ICRISAT), Reinhardt Howeler (cassava agronomist, CIAT), Gene San Valentin (agronomist, UNTAET-Division of Agricultural Affairs), Upali Jayasinghe (virologist, CIP).

Front row (sitting L to R) - Jose Abel (East Timorese Director - Division of Agricultural Affairs), Dineen Tupa (Team Leader, World Vision), Edwin Javier (rice breeder, IRRI).

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3. **Spatial variability in watersheds: Scientists learn how to turn land variability to their advantage.**

In the past, land variability was considered a defect to be eliminated. Huge investments were made in irrigation and fertilizer to overcome water or nutritional limitations of farmers' fields.

The problem was, only the wealthier farmers could afford this. And the poorest farmers – those dependent on scant rainfall in the dry tropics – were falling far behind.

Nowadays, researchers are using the new tools of information technology to understand variability and adjust cropping patterns to suit it. But how applicable is this high technology to poor rural farmers? Even national scientists in the poorest countries lack access to such advanced tools.

To help overcome this bottleneck, scientists from Thailand, Vietnam, and India came to ICRISAT's headquarters near Hyderabad, India in November to familiarize themselves with these tools – geographical information systems, crop simulation, and remote sensing technologies – to characterize and manage variability in agricultural watersheds (small valleys) in Asia, and to determine the impacts of this variability on crop production and on the protection of natural resources.

Rome wasn't built in a day. Over time, efforts like these to share and disseminate these new

technologies will lead to practical field indicators and communications systems that help even the poorest farmers make better use of land variability.

Made possible through the generous support of the Asian Development Bank, the workshop also tapped the expertise of scientists from the National Remote Sensing Agency of India (Hyderabad), the University of Georgia (USA), and ICRISAT itself.

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4. Scientists are on the verge of creating the world's first cytoplasmic male-sterile hybrid pigeonpea, which could create a big leap in production and farm incomes

Hybrids can increase production by 25% or more, reaping huge income gains for farmers. They have revolutionized modern cereal agriculture, especially for corn (maize). It has been much more difficult to implement the system in food legumes (pea and bean crops), though, because they do not outcross easily.

ICRISAT is well known for having convened an inter-institutional effort in India during the late '80s/early '90s that developed the world's first hybrid variety of any food legume crop, anywhere in the world. The crop, pigeonpea, is a staple of South Asian diets, although it is also widely grown across Africa.

But that hybrid was difficult to produce on a commercial scale, because it utilized nuclear-genetic male sterility – a system that required intensive field labor to rogue out, or remove, any fertile plants to avoid contamination. This invoked high labor costs and skill requirements among seed producers. As a result, the hybrid seed industry never fully realized its potential.

Now, this problem is nearly solved – as scientists report positive results from a decade-long quest to discover *cytoplasmic* male-sterility (CMS) that does not face this contamination problem.

To achieve this breakthrough, the cytoplasm of a wild relative of pigeonpea *Cajanus sericeus* was successfully moved into a cultivated genetic background, through years of painstaking crosses and backcrosses by an inter-institutional consortium convened by ICRISAT in India.

The fertility restoration system, a second vital component of the new CMS hybrid technology, has also been established, thus clearing the way for developing the first CMS-based pigeonpea hybrid in the near future.

This major scientific advance could only have been possible through partnership, because a number of different wild species had to be considered and tested in order to find at least one that would work. The partners included Bhabha Atomic Research Center (BARC), Indian Agricultural Research Institute (IARI), Indian Institute of Pulses Research (IIPR), Narendra Dev University of Agriculture and Technology (NDUAT), Punjabrao Krishi Vidhyapeet (PKV), Gujarat State Fertilizer Company (GSFC), and ICRISAT. The Maharashtra Hybrid Seed Corporation - MAHYCO – a leading private sector seed company in India – also participated actively, and is providing significant financial support to the project as well.

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5. Groundnut variety CG7: a boost to Malawian agriculture

In Africa, groundnut (peanut) is known as a woman's crop. Grown by them around the households, it is a vital source of cash income and nutritious, high-protein food for the household. Children especially benefit from women's food and income-generating activities. Women and children are at highest risk of malnutrition in Africa, so the benefits of improved groundnut technology go right to those who need it most.

Malawi is delivering those benefits to its poor through the new variety 'CG 7', jointly developed by the Department of Agricultural Research and Technical Services and ICRISAT.

CG 7 is now grown on 10% of Malawi's groundnut area, contributing approximately MK 449 million (= US\$ 6.41 million) annually in revenues.

Compared to the previously-grown varieties, CG 7 yields an extra 236 kilograms of grain from each

hectare, valued at US\$ 118. At current prices, if CG 7 spreads in the coming years to replace just half of the area currently under the old varieties, the national agricultural income will increase by US\$ 8.5 million per year.

Seed shortages remain a constraint, but a number of humanitarian organizations are vigorously spreading the seed throughout the countryside. Recent data from the UN Food and Agriculture Organization's Famine Early Warning System suggests that CG 7 adoption has increased in geometric progression in recent years.

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6. National researchers persevere despite funding constraints to deliver impact in El Salvador

ICRISAT's Mexico-based Latin American Sorghum Improvement Program (LASIP) closed 7 years ago because of funding constraints but it left a dedicated cadre of trained national researchers who are still delivering the goods many years later.

Rene Clara-Valencia, formerly ICRISAT's sorghum breeder in LASIP, reports that three improved sorghum open-pollinated cultivars from LASIP have been released and multiplied for use by farmers in El Salvador during the last 5 years.

"Their release and distribution by CENTA (Centro Nacional de Tecnologia Agropecuaria y Forestal), is indicative of the strength of the national programs in that region," said Dr. Tom Hash, ICRISAT Scientist. "Their strength is a result of in-service training programs for technical staff from CENTA, and the germplasm exchange coordinated by ICRISAT and the International Sorghum/Millet Collaborative Research Support Program (INTSORMIL)," he added.

Rene indicates that the cultivars are 'Soberano', 'R.C.V.', and 'Jocoro'. They are based on LASIP crosses of breeding lines received from ICRISAT-Patancheru, the former ICRISAT Sorghum Breeding Program in Sudan, and Texas A&M University.

In 1999, these three cultivars accounted for 64% of all the certified sorghum seed produced in El Salvador. During that year, these three cultivars occupied 40% of the 35,000 hectares sown to modern grain sorghums in that country.

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7. ICRISAT celebrates the power of partnership in India-ICRISAT Day

"The collaboration between India and ICRISAT is helping to steadily extend the Green Revolution to the poor of the dry central regions of the country who had been bypassed the first time," said Dr. William D. Dar, ICRISAT Director General, in his speech at the India-ICRISAT Day Celebration on November 15.

India-ICRISAT Day was held at ICRISAT headquarters near Hyderabad to commemorate the Institute's contribution to Indian agriculture through close partnership with the Indian Council of Agricultural Research (ICAR).

Referring to this long and fruitful partnership, Shri Nitish Kumar, Honorable Agriculture Minister, Government of India, stated in his message, "It is heartening to know that the varieties and hybrids developed jointly by ICAR, Agricultural Universities of India, and ICRISAT are grown in large areas not only in India but in other countries as well."

Shri Vadde Shobhanadreeswara Rao, Honorable Minister for Agriculture and Horticulture, Government of Andhra Pradesh was the Chief Guest. He urged ICRISAT and ICAR to make farmers aware of the ever-increasing portfolio of new technologies.

Dr. R. S. Paroda, Director General, ICAR, gave the opening remarks. Other distinguished speakers included Shri Bhaskar Barua, Secretary, Ministry of Agriculture, Government of India; Shri P.V. Rao, Chief Secretary, Government of Andhra Pradesh; Dr. Mangala Rai, ICAR Deputy Director General

(Crops); Dr. Jill Lenne, ICRISAT Deputy Director General, Dr. James G. Ryan, former Director General of ICRISAT; Dr. Y.L. Nene, Former ICRISAT Deputy Director General; Dr. M. V. Rao, Former Vice-Chancellor, Acharya N G Ranga Agricultural University (ANGRAU); and Dr. E. A. Siddiq, National Professor, Directorate of Rice Research (DRR).

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8. ICRISAT and World Vision International join hands to deliver improved technologies to needy communities in Southern Africa

Erasing traditional boundaries, research institutions like ICRISAT are teaming up with community-based assistance organizations to speed up the delivery of technologies that can help the poor. About 80 million poor people live on less than a dollar a day in the semi-arid areas of sub-Saharan Africa. Most work in agriculture, and they are becoming increasingly weakened by the world's highest incidence of HIV/AIDS.

ICRISAT and World Vision International (WVI), which focuses on health care needs of the poor, organized a joint workshop from 20-23 November at ICRISAT's station near Bulawayo, Zimbabwe entitled "Dissemination of Technologies Enhancing Smallholder Income in Sub-Saharan Africa". It was inaugurated by Dr Joseph Made, Zimbabwe's Minister of Lands, Agriculture, and Rural Resettlement. Other partners and experts participated from the International Sorghum/Millet Collaborative Research Support Program (INTSORMIL), the United States, the University of Wales, and the national agricultural research program of Zambia.



Through this workshop, the partners shared information on farmer-ready technologies that can be transferred to communities in the project areas where WVI works.

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