Risk mitigation strategies to tackle drought; soil nutrient and micronutrient management status; dissemination of technology at all project sites; and bridging yield gaps were some of the key points discussed at a team building workshop for the Rythu Kosam project. (For more, see pages 2 and 3).

This project aims to transform the primary sector in all 13 districts of Andhra Pradesh, India, by increasing productivity and improving rural livelihoods in horticulture, animal husbandry, fisheries and other sectors.

Mr SP Tucker, Special Chief Secretary, Planning Department, and Agricultural Production Commissioner, Government of Andhra Pradesh, emphasized on improving the yield gaps that existed in various districts across the state and cited the example of Rayalaseema region. He applauded Tamil Nadu’s digital agriculture initiative and spoke of the state’s participation in the project. A database with data on 70-80 lakh farmers will be available through this initiative, he said.

Dr David Bergvinson, Director General, ICRISAT, spoke about the role of digital agriculture and urged the team to understand the needs of the stakeholders to provide a demand-driven knowledge and input delivery system. He encouraged the team to focus on better management practices by improving the ecosystem services offered by agriculture. He laid emphasis on transforming the education system in order to equip scientists and farmers to help achieve the required growth in the primary sector of the state.

Dr Suhas Wani, Director, ICRISAT Development Center, discussed strategies on how to achieve an increase of up to 18% in the growth rate of the primary sector.

The team building workshop for Rythu Kosam project was held on 20 August at ICRISAT headquarters. Pilot site presentations were made by various district coordinators and nearly 75 participants from the Planning Department, Acharya NG Ranga Agricultural University, Dr YSR Horticultural University, Department of Agriculture and Horticulture, NGOs and ICRISAT team members attended the workshop.

“We need to strengthen rural livelihoods and we have to look at the larger picture instead of focusing only on rainfed agriculture development.”

— Mr SP Tucker, Special Chief Secretary, Planning Department, and Agricultural Production Commissioner, Government of Andhra Pradesh
Rainfall situation in Andhra Pradesh

Large variation in rainfall was observed across the 37 pilot sites since 1 June this year. The site in Visakhapatnam district received about 680 mm, while those in Anantapur, Kadapa, Nellore and Kurnool districts received less than 100 mm. The total area sown in the state is 1,987,000 ha as against the normal sown area of 2,686,000 ha (deviation of -26%) as on 12 August.

Contingency plans for drought-proofing

Due to poor rainfall in the state, the following measures were promoted –

Contingency crops: Seed of hardier crops like foxtail millet, pearl millet, cluster bean and castor were provided to farmers for sowing as most farmers could not sow groundnut and paddy.

Early postrainy sowing: In regions where moisture is so little that even sowing of contingency crops cannot be taken up, the seed of postrainy crops like horse gram, chickpea, black gram and green gram were provided to take advantage of early postrainy sowing.

Fertilizer management: This includes – foliar application of nutrients; reducing basal dose to half; and application of compost and mulches at the base of plants.

New publications

Understanding Trait Preferences of Farmers for Post-Rainy Sorghum and Pearl Millet in India — A Conjoint Analysis

Authors: G Basavaraj, P Parthasarathy Rao, Lalith Achoth, MA Lagesh, VG Pokharkart, SK Gupta and A Ashok Kumar


Abstract: A study was carried out on two important dryland crops, i.e., postrainy season sorghum and pearl millet which are staples in Maharashtra, Karnataka, Rajasthan and Gujarat states of India. Both postrainy (rabi) season sorghum and pearl millet are mainly grown under low rainfall regimes as they are drought tolerant and are prized for grain quality and fodder.

The present study is undertaken to quantify the varietal attributes preferred by the farmers for postrainy sorghum and pearl millet using conjoint analysis technique. With this knowledge, researchers can focus on the most important features of seeds and design a variety that is most likely to gain acceptance of the target buyers. Further the utility attributes derived from the analysis are used to simulate preferences for new improved cultivars for both the crops that will identify the most preferred variety. The study would thus help in screening new improved cultivars of these crops for preferred attributes and overall preference. http://oar.icrisat.org/8789/

Rapid, accurate and routine HPLC method for large-scale screening of pro-vitamin A carotenoids in oilseeds

Authors: Madhurima Bhatnagar-Panwar, Pooja Bhatnagar-Mathur, Venkata Vijay Anand Bhaaskarla, Srinivas Reddy Dumbala, Kiran K Sharma


Abstract: The study reports a rapid method for high volume HPLC analysis involving extraction and determination of β-carotene in four oilseed crops (peanut, soybean, sunflower and mustard) and this included a comprehensive study of factors that potentially influence qualitative and quantitative yields of β-carotene. This is the first crop-independent HPLC method for quantification of pro-vitamin A carotenoids that shows excellent recovery and reproducibility (>90 percentage recovery in oil) and capable of processing up to 30 samples per day. Protocol is sensitive, enabling better detection and separation of individual carotenoids. http://oar.icrisat.org/7119/

Soil test-based nutrient management

Soil fertility degradation due to extensive mining and mismanagement over the years has led to nutrient deficiencies including those of secondary and micronutrients like zinc, boron and sulfur, in addition to low levels of soil organic carbon, nitrogen, phosphorus and potassium.

Nutrient deficiencies are apparently limiting the realization of optimum yields, and use-efficiency of macronutrients as well. Therefore, soil test-based scaling out of fertilizer management is one of the key components of the project. The provision of a sum of ₹900 m (US$ 13.6 m) as incentive on micro and secondary nutrients for about 1.7 million ha is expected to result in Gross Value Added (GVA) of ₹9.5 billion (US$ 144 m) in the state. Similarly, more than 0.5 million ha drip systems for vegetables, fruits and other crops like groundnut and cotton, available with farmers in the state, will be effectively utilized for regulated supply of nutrients through fertigation.

The plan for 2015-16 aims to enhance productivity in the existing micro irrigation system in 0.3 million ha through fertigation along with soil test-based addition of micro and secondary nutrients. An investment of about
Scale Economies, Technical Efficiency, and the Sources of Total Factor Productivity Growth of Quebec Dairy Farms

Authors: Alphonse Singbo and Bruno Larue


Abstract: Canada’s average cost of milk production is among the highest in the world. This paper focuses on specific potential causes by estimating economies of scale and technical efficiency for a panel of Quebec dairy farms that spans the 2001–2010 period. Additionally, this paper investigates the sources of total factor productivity growth. The stochastic frontier analysis, based on an input-distance function, is used to estimate returns to scale relationships across dairy farms. The results show that there is significant economies of scale to be exploited and that cost of production could also be reduced by improving technical efficiency. Accordingly, the paper indicates that input-mix effect is the main source of total factor productivity growth. The results have important implications for Canada’s supply management policy, and more specifically for the trading of production quota between dairy farmers, as well as for the delivery of targeted extension services.


Potassium release characteristics, potassium balance, and finger millet (Eleusine coracana G.) yield sustainability in a 27-year long experiment on an Alfisol in the semi-arid tropical India


Abstract: For balanced nutrient management in cereal production systems, potassium (K) nutrition needs urgent attention in the K deficient Alfisol regions of southern India. Addition of organic manure offers an alternative strategy for maintaining soil K. The highest sustainable yield index (SYI) was observed using an integrated nutrient supply (combined application of nutrients from organic and inorganic sources), and the lowest index was obtained without K additions. The study evaluated the effects of 27 years (1978–2004) of cropping finger millet (Eleusine coracana G.) under different manure and mineral fertilizer treatments on K release, balance and yield sustainability on K deficient Alfisols in the semi-arid tropical region of southern India.

http://oar.icrisat.org/7083/

Digital technologies for knowledge sharing

- **Krishi Vani:** ICRISAT in collaboration with IFFCO Kisan Sanchar Limited (IKSL) and Bharti Airtel have piloted the project in 171 villages in Telangana and Karnataka benefiting 40,000 farmers. Generic advisories are delivered to farmer groups in a location, on their mobile phones.

- **Tablet-based extension system:** Piloted in Karnataka, this system will be used for knowledge sharing from lab to farmers as well as to collect information from farmers to labs.

- **Farmer-to-farmer (F2F) knowledge sharing using Pico projectors:** The advantage of this system is that farmers trust fellow farmers more when it comes to adopting improved management practices. Farmers share their experiences about using various practices in their regional language on camera. These short videos are screened to small gatherings of 20-30 farmers in villages, using battery-operated Pico projectors.

Yield gap between Andhra Pradesh and highest yield in other states of India

<table>
<thead>
<tr>
<th>Crop</th>
<th>Andhra Pradesh</th>
<th>Highest</th>
<th>Second Best</th>
<th>Percentage gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>3116</td>
<td>3918 (TN)</td>
<td>3741 (PUN)</td>
<td>20.0</td>
</tr>
<tr>
<td>Sorghum</td>
<td>1887</td>
<td>2011 (MP)</td>
<td>-</td>
<td>6.6</td>
</tr>
<tr>
<td>Pearl Millet</td>
<td>1704</td>
<td>2452 (TN)</td>
<td>2040 (HAR)</td>
<td>43.9</td>
</tr>
<tr>
<td>Maize</td>
<td>7012</td>
<td>7012 (AP)</td>
<td>6042 (TN)</td>
<td>-</td>
</tr>
<tr>
<td>Pigeonpea</td>
<td>402</td>
<td>1693 (KER)</td>
<td>1514 (BIH)</td>
<td>321.0</td>
</tr>
<tr>
<td>Chickpea</td>
<td>1142</td>
<td>1295 (BIH)</td>
<td>-</td>
<td>13.4</td>
</tr>
<tr>
<td>Groundnut</td>
<td>640</td>
<td>2751 (TN)</td>
<td>1938 (WB)</td>
<td>329.8</td>
</tr>
</tbody>
</table>

Source: DES, Gov. of AP

TN: Tamil Nadu; MP: Madhya Pradesh; KER: Kerala; BIH: Bihar; PUN: Punjab; HAR: Haryana; WB: West Bengal
Farewell

The following staff members are retiring on 31 August:

Ms K Syamalamba, Senior Executive Associate (Administration), KSI – Learning Systems Unit, after serving the Institute for over 33 years.

Ms Gyaneshwari Bajpai, Administrative Officer, Office of Internal Audit, after serving the Institute for over 35 years.

Mr Mohd Azeez, Senior Scientific Associate, Research Program – Dryland Cereals, after serving the Institute for over 36 years.

Mr Mohd Basheer Ahmed, Scientific Associate, ICRISAT Development Center, after serving the Institute for over 29 years.

Mr KSP Varma, Technical Officer, Genebank, after serving the Institute for over 38 years.

Ms C Laxmamma, Senior Field Helper II, Research Program – Dryland Cereals, after serving the Institute for over 42 years.

Mr Mohd Basheer Ahmed, Scientific Associate, ICRISAT Development Center, after serving the Institute for over 29 years.

Mr B Prabhakar Reddy, Senior Field Helper II, FETS – Farm Services, after serving the Institute for over 37 years.

Team ICRISAT wishes them a very happy retired life.

Readers’ comment

I am very happy that your recent initiatives have evoked excellent response. I wish you continued success.

– MS Swaminathan, Founder Chairman, MS Swaminathan Research Foundation, Chennai

The inclusion of Tef, in ICRISAT’s research program is indeed very important. This highly potential and nutritious crop remained neglected and underutilized so far and indeed highly deserves attention for research for its exploitation and utilization.

– Dr Bhag Mal, Senior Consultant, Asia-Pacific Association of Agricultural Institutions (APAARI), New Delhi

We also need to look into cropping systems research involving Tef and its economics. We have to drive a program that focuses on environmental and economic services delivered by such crops.

– Dr EVS Prakasa Rao, Advisor (Consultant), Medicinal and Aromatic Plants, Sustainable Agriculture, Bengaluru

We need suggestions for improving the bioenergy program in India, on how we can increase the contribution of the agriculture sector to the energy sector in a clean, green and sustainable way without affecting agriculture production.