

## In this issue

### Crop Resources of Koraput

*Neglected, underutilised*

Koraput district in Odisha has topography with great variations in altitude. Annual rainfall and temperature also vary considerably from place to place. So the ecological diversity is very high. FAO recognises it as a global agricultural heritage site, a centre of diversity for many food crops.

The populations there, more than 50% of which is tribal, has survived being lashed by cyclones from the Bay of Bengal for centuries. Their resilience depends on equally resilient indigenous rice varieties, some with superior aroma along with grain quality traits, millet varieties some of which have lower levels of sodium than potassium, wild fruits and leafy vegetables and tubers.

These vital genetic resources with traits that can withstand drought, floods and salinity are being gradually eroded, rue researchers from the Central University of Odisha, in a General Article in this issue.

The underutilized crop resources of Koraput need urgent attention from agricultural researchers lest they go caput, point out the researchers. The neglected genetic resources need to be conserved and managed for climate resilient and sustainable agriculture in the region. Turn to **page 989** for details.

### Acts and Amendments

*Agricultural economics*

In September 2020, the Union Government enacted two new farm Acts and amended the Essential Commodities Act, 1951. In a General Article in this issue, researchers from the ICAR-National Institute of Agricultural Economics and Policy Research, New Delhi examine the historical antecedents and the context in which these steps were initiated: the goals of doubling farmers' income, becoming a five trillion dollar economy and achieving the Sustainable Development Goals.

These steps in legislation are necessary to make agricultural marketing more competitive, efficient and liberalized. They are meant to strengthen the supply chain, modernize agriculture and

make the agriculture sector more responsive to market forces. They will bring in much needed investment in post-harvest infrastructure and will improve food management in the country, say the economics and policy researchers.

The Acts and the amendment have stirred controversy and the farmers who are meant to benefit from them have been protesting for the last few months. So the General Article might promise to be the beginning of a scientific debate you can't afford to miss. Turn to **page 981** now.

### Enemy of Enemy is Friend

*Cross-cropping for cotton weeds*

Cotton farmers in Maharashtra suffer from low yield due to weeds. Mechanical weeding is costly and not viable. Pesticides have short-term benefits but unseen long-term impacts. Add this to the slow growth of cotton, which allows different weeds to attack at different phases.

Pooja Verma from the ICAR-Central Institute for Cotton Research, Nagpur might have a solution: intercropping. Crops like sunn hemp, sorghum, and pearl millet give a proxy defence to cotton against weeds. These crops engage in chemical warfare by releasing allelochemicals that affect the growth of weeds.

But do these crops work as natural herbicides? What are the chemicals they release? Do they enhance the production of cotton?

The researchers tackle these questions in a Research Article on **page 1035** in this issue.

### Microbes at Work

*Heavy metal remediation*

Heavy metals in the ecosystem are unhealthy for us. The ground we walk on is replete with them. They seep through into drinking water and silently move up the food chain.

The chemical stability of heavy metals makes degradation difficult. But nature has an invisible life-force, which offers a natural way to clean up heavy metals: bacteria and fungi.

Amanso Tayang and L. S. Songachan from the Banaras Hindu University, Varanasi study the nuances of heavy metal bioremediation by microbes. In a Review Article in this issue, the researchers examine microbial physiology under heavy metal exposure, and how microbes interact with different metals and develop survival strategies.

The cell wall protects the microbes and adsorbs metals. The accumulated metal is transported by ion pump channels for metabolic needs. Some microorganisms can solubilize and even incorporate heavy metals into safer byproducts. Thus microbes can act as effective sinks for heavy metals.

This understanding can be leveraged on to reduce the concentration of metals in the environment. But different microbes degrade different metals based on their biochemical pathways. The genetic profiles of microbes provide the bigger picture about the degradation pathways, say the researchers.

Curious? Dive to **page 1013** to read further.

### Cutaneous Leishmaniasis

*Predicting potential targets*

Out of about 20 or so *Leishmania* species that are pathogenic to humans, two - *L. major* and *L. tropica* - are known to be major causes for cutaneous leishmaniasis, a painful and disfiguring disease. The treatment is also painful and prolonged. To top it all, the parasites seem to be evolving resistance against the drugs used. We need to find drugs to hit the pathogen where it hurts most. And that is what biomedical researchers from Iran set out to do.

They cultured the organisms and used the procyclic promastigote phase of their life cycle to examine the proteomes. Using bioinformatic approaches, they identified the differentially expressed genes and the functionalities of the protein networks to identify potential targets that may disable the metabolism of the parasite. In a Research Article on **page 1040** in this issue, they uncover targets for vaccines and drug designs.

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