

In this Issue

Research activities
Days celebrated
Meetings
Workshops/Seminars
Exhibitions
Appointments
Transfers
Retirements
Visits abroad
Obituaries

Forth Coming Events

Agriculture Education Day on August 7

MTC on "Efficient Supply Chain Management and Marketing of Horticulture Produce in Dry Regions" during September 1-8 at CAZRI, Jodhpur

Regional Committee meeting for Zone VI at AAU, Anand on September 12-13

Kisan Mela and farmers' Innovation Day on September 24

From the Director...



The land degradation in arid regions and elsewhere in India is becoming a major challenge. It is extremely important to tackle this issue, more so in context of food security of our citizens. Continued maintenance of good soil health is thus critical to us. It is now believed that protecting soil quality should also be a fundamental goal of national policy, just like protecting air and water quality. Soil quality management has six essential components: enhancing soil organic matter, avoiding excessive tillage, managing pests and nutrients efficiently, preventing soil compaction, keeping the ground covered and diversifying cropping/farming systems.



Soil quality is a function of physical, chemical and biological properties and their interactions. A soil may be fertile but not productive. Therefore, it cannot be measured directly, but only inferred from measuring changes in the attributes. The minimum data sets for a given location and land use (grassland, crop land, forest land, agro-forestry etc.) need to be developed that are easy to measure and also sensitive to changes. Such an indicator should take into account the chemical, physical, biological and fertility aspects of soil.

Apart from developing good soil quality indicators, there is need to invest more in researchable issues like enhancing soil carbon stock, site specific nutrient management approach, improving soil biological diversity, improving problematic soils, rehabilitation of wastelands, developing land use strategies using land capability and land management approaches at micro-levels in a participatory mode.

- M.M. Roy

Research Activity

Pimpa (*Caralluma edulis*): A Traditional Food cum Medicinal Plant of Thar Desert

Caralluma edulis (Edgew.) Benth. & Hook. f. (Family: Asclepiadaceae) is highly drought resistant succulent, perennial herb locally known as *Pimpa*. It grows in loose deep sandy soils with Murath grass (*Panicum turgidum* Forsk.) and/or with an array of arid shrubs. It is used as a vegetable and pickle in rural areas of Jaisalmer district. It is reported to be a good source of minerals. Fresh upper succulent portion is acidic in taste, and eaten raw for quenching thirst by the rural folks. It has other health benefits like blood purifier, remedial in common digestive problems, anti-constipation and good for bone strength etc. It has fodder value too and is highly

preferred by camels and goats but less by cattle and sheep.

Due to degradation of grassland cover, grazing pressure and changes in land use pattern in the region; its popu-

lation has decreased to a great extent. At present it is found in patches of some sandy areas in Jaisalmer district only. Research on its nutritive and medicinal properties and possibilities of its cultivation in sandy tracts needs attention.

- J.P. Singh, Suresh Kumar, K. Vanketasan and R.N Kulloli



Field and close-up view of *Caralluma edulis*

The Indian gerbil (*Tatera indica*) a predominant rodent pest of arid region

In western Rajasthan, Indian gerbil or the antelope rat, *Tatera indica* is the key rodent pest in agriculture. Of the three subspecies found in India, only *Tatera indica hardwickei* is found in this region. Ecological distribution of the species revealed its presence from extreme desert to sub-humid zones of Rajasthan. Although the species is mainly a field rodent, its population has been reported from urban locales of Bikaner and Jodhpur indicating commensalisation.

In arid regions these gerbils feed on the seeds of grasses, shrubs and tree species in winters. In the summer when the vegetation is totally desiccated, they shift to stems and rhizomes.

However, during the monsoon, they mostly feed on green plant parts.

Breeding in *Tatera* takes place round the year, with maximum littering in February and August. Litter size varies from 1-9 with a gestation period of 28.2 days and an adult female can produce 17.72 young ones annually. *T. indica* along with *Meriones hurrianae* forms a pest complex in various production systems of arid zone, which is responsible for 2-7 per cent damage to arid crops. Keeping in view the menace of gerbil in agriculture its management is an essential requirement.

- Vipin Choudhari

Performance of Tharparkar cattle fed on thornless cactus (*Opuntia ficus indica*)

In the changing climatic conditions and global warming, many common crops of present day may fail to provide required quality of green fodder to animals. Hence, there is a need to explore suitable crops that can provide green fodder to animals under water scarce areas. Thornless cactus could be a good alternative under harsh conditions because of its hardiness, lower water requirement and higher biomass production potential. A feeding trial of *Opuntia ficus indica* @ 2.5 kg per calf per day along with *ad libitum* offering of *Cenchrus ciliaris* hay and 1.05 kg concentrate, decreased dry matter intake by 0.18 kg compared to calves maintained on *C. ciliaris* hay plus concentrate (5.14 kg head⁻¹ day⁻¹). Feeding of cactus reduced daily water intake by 7.43 litres compared to animals maintained on hay plus concentrate only (22.73 litres head⁻¹ day⁻¹). Feeding of cactus increased total digestible nutrients from 55.95 to 70.43 per cent.

- B.K. Mathur



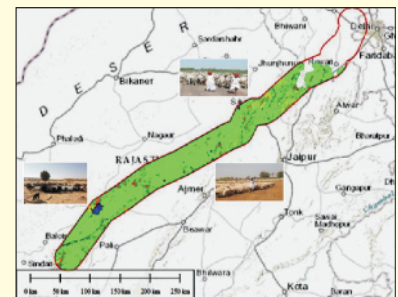
Effect of supplementation of multi nutrient blocks on milk yield of ruminants

Multi Nutrient Block (MNB) were offered to the bovines @ 250 g head⁻¹ day⁻¹ and Multi Nutrient Mixture (MNM) to goats @ 100 g head⁻¹ day⁻¹ at 12 selected villages of Nagaur district under NRAA project. The average daily milk yield of cows and buffalo increased to the tune of 7.70 and 5.80 per cent, respectively with supplementation of MNBs. The B:C ratio of the intervention was higher (4.48) in buffaloes than cows. The daily milk yield of goats ranged from 1.4 to 1.8 litre with average improvement in daily milk yield of 14 per cent.

- M. Patidar and R. N. Kumawat

Livestock migration in the arid region of Rajasthan, India

Pastoralist communities with flock/herd size from 42-250 heads of small ruminants and 35-220 cattle in dry lands move along with their animals in search of better forage and water resources during scarcity periods. The study conducted by



Migration route & water sources en route

CAZRI showed three kinds of livestock migration in vogue: (1) local/temporary, (2) semi-migration in large size flocks and (3) permanent migration where animals are permanently moved from the home tract to other districts or states. During the observation period animals on an average travelled 8.71 km day⁻¹ and drank water once a day, if available. At times, they had to cover 18-22 km, to locate a water source. During migration pastoralists faced difficulties in obtaining institutional health services, quality medicines at reasonable price and encountered criminals on migratory routes.

Improving the condition of the existing common grazing lands with community participation, provisions for mobile veterinary services and quality medicines from state governments, law and order maintenance on migratory routes will be a positive step towards helping migratory livestock owners.

- A.K. Misra

Utilization of the extended monsoon rainfall for crop production

In the last week of September, 2013 heavy rain event occurred at Village Purkhawas. By that period pearl millet and other *kharif* crops were harvested. The rain was perceived as wastage, because traditionally farmers of this village cultivate only in monsoon season and fields are kept fallow during winters. But KVK, Jodhpur used this opportunity and encouraged farmers to use the additional rainfall through moisture conservation techniques for growing taramira crop. The matter was discussed with

farmers and seeds of taramira (RTM-314) were distributed to interested farmers. With this intervention farmer got an average seeds yield of 500 kg per hectare, which resulted in additional income of approximately ₹ 14000/- per hectare.



- A.K. Mishra, R.R. Meghwal and Manoj Kumar

Vegetable cultivation: A potential approach for integrated farming system

Field demonstrations were carried out by scientists to promote vegetable cultivation in Utamber village of Balesar tehsil, district Jodhpur. The village is primarily rainfed with

18 per cent irrigated area. *Kharif* vegetables (ridge gourd and ladyfinger) and *rabi* vegetables (spinach, radish, peas and tomato) were grown by using improved production technologies. During



kharif season highest net return (₹ 82000 per ha) was obtained with the cultivation of ladyfinger, but maximum B:C ratio (3.10) was obtained with ridge gourd. Among all the crops grown during *rabi* season, radish fetched highest net monetary benefit (₹ 110500 per ha) with B:C ratio (4.25). Tomato was observed as the next best crop with net return of ₹ 84000 per ha.

- Soma Srivastava and Raj Singh

Other Activities

Days Celebrated

Industry day was organized under the theme “Agri-entrepreneurs Initiative” on 5th May, to sensitize about the issues related to development of viable industry-institute linkage and to give a new dimension to technology management and commercialization. It focused on new developments, challenges and modern technologies generated at CAZRI in recent years. The stakeholders from the industry side attended this meet. Deliberations on novel solar devices, nano-fertilizer, *Prosopis juliflora* and gum induction etc. coupled with display of value added products of different indigenous plants of arid zones were the highlights of the program. Chief Guest, Dr Varun Arya, Director, Aravali Institute of Management, Jodhpur delivered a popular talk on “Extremely Saline Wasteland to Green Campus: The Transformation”. Representatives from print and electronic media were also present and covered the Industry meet.



World Environment Day celebrated on 5th June, under the aegis of ENVIS Centre on Desertification. Dr G. Singh, Scientist-F, AFRI, Jodhpur and Prof. Pawan Kasera, JNVU, Jodhpur delivered lectures on this occasion. CAZRI Scientists also shared their views on 'Impact of Climate change and its mitigation'. About 100 scientists, technical and other officers/staff were present during deliberations.

World Day to Combat Desertification celebrated on 17th June, organised by ENVIS Centre on Desertification, (MoEF). Dr K.D. Sharma, Ex-



Member, National Rainfed Area Authority, Planning Commission, Govt. of India, delivered a talk on 'Adaptation to climate change in water sector'. Dr R.S. Tripathi appraised about the ENVIS activities. Scientists, technical and other staff participated in the program.

Meetings

Institute Research Council meeting was held from 21-26 April. In this meeting new projects were approved and the progress reports on on-going and concluded projects were presented by respective principal investigators.

Fifth Partners Meeting of Cold and Hot Arid Network Project

was held on 12-13 June. Dr M.M. Roy, Director CAZRI Chaired the meeting. Cold Arid Network Project Coordinators gave brief account on the progress of projects. Partners from SKUAST-K, Kashmir, CSKHPKU, Palampur, GPBHE&D, Almora, YSPUH&F, Solan, TNAU, Coimbatore, MFAU, Rahuri, MV&FSU, Nagpur, ANGRAU, Hyderabad and UAS, Raichur participated in this meeting.



Workshops/Seminars

A three day seminar cum **workshop on 'Geomorphological mapping for natural resources assessment in Rajasthan'** was organized by the institute. The technical program was divided into one day seminar on the 6th May at CAZRI and two day field trip to selected sites on 7th and 8th. 30 participants from GSI, ISRO, JNVU, Jodhpur, IIT Kharagpur, CAZRI and State Colleges



attended the seminar. During the field trip on 7th May participants visited sand dunes, rocky uplands and saline Ranns at Balesar, Dechu, Shatrewa, Lawan, Pokaran, Chandan, Bhojka, Basanpir and Sam and on 8th May rocky plains at Mokal, Chhatrail, Roopsi and Lodurva sites were visited.

2nd Innovation platform meeting /workshop of CGIAR Research Program for Dry land Systems (CRP 1.1) on 'Integrated agriculture production system for the poor and vulnerable' was held at CAZRI, Jodhpur on 22nd May, in collaboration of ICRISAT, Hyderabad and Gramin Vikas Vigyan Samiti, Jodhpur.



Workshop on 'Coping Strategies for Livestock Smallholders in the Face of Climate Change and Soaring Feed Prices: Case Study of Livestock Mobility in the State of Rajasthan, India' in collaboration with International Center for Agricultural Research in the Dry Areas (ICARDA), Jordan, was organized at CAZRI, Jodhpur on 29th May. More than 45 officials from various ICAR institutes, CWDB, line departments and 50 pastoralists from four districts of western Rajasthan (Pali, Jodhpur, Barmer and Jalore) attended the workshop. Dr M.M. Roy, Director, CAZRI chaired the workshop. Dr Mahesh Katara, CEO, Rajasthan Livestock Development Board (RLDB), Jaipur underlined importance of pastoralism in Rajasthan. Mr K.K. Goel, Executive Director, Central Wool Development Board (CWDB) highlighted the various sheep and wool development schemes of the board for the benefit of pastoralists migrating to far distances in search of fodder. Dr L. Mounir, Research Scientist, ICARDA, Jordan emphasized the need of disseminating of real-time information to the pastoralists. Dr A.K. Misra, Head, Division of Livestock Production Systems and Range Management, CAZRI, discussed about sheep and livestock migration related issues.



Exhibitions

May 1-3: 2nd Rajasthan Science Congress at Dr K.N. Modi University, Newai, Tonk

5 May: Industry Day at CAZRI, Jodhpur



Appointments

Shri Abhishek Kumar, Scientist (Agroforestry) on 5.4.2014

Ms Keerthika A., Scientist (Agroforestry) on 7.4.2014

Shri Rahul Dev, Scientist (Economic Botany) on 7.4.2014

Shri Dipak Kumar Gupta, Scientist (Environmental Science) on 7.4.2014

Dr Anil Kumar Shukla, Head, Regional Research Station, Pali on 6.6.2014

Transfers

Dr Ajayvir Singh Sirohi, Senior Scientist (LPM) on 28th April, relieved from this Institute to join as Senior Scientist at PDC, Meerut (U.P.)

Dr Khem Chand, Principal Scientist (Agriculture Economics) on 30th May, relieved from this Institute to join as Head at IGFRI, Jhansi (U.P.)

Retirements

April: Shri Mohan Singh Choudhary, Technical Officer; Shri Pradeep Kumar Joshi, Technical Officer; Shri Datta Din Saini, Senior Technician; Shri Ranchore, SSS; Shri Deepa Ram, SSS

May: Shri Budha Ram, Technical Officer; Shri Chandra Pal Singh, Technical Officer; Shri Madan Lal S/o Shri Ishwar Dass, Technical Assistant; Smt. Meera w/o Shri Dungan Ram, SSS

June: Dr S.K. Lodha, Principal Scientist; Shri Pramesh Chander Bohra, Senior Technical Officer; Shri Achal Singh, AAO; Shri Ganga Singh Khichi, Technical Officer; Shri Abdul Samad, Technical Officer; Shri Jera Ram, Technical Officer; Shri Satya Narayan Chouhan, Technician; Smt. Shandani, SSS

Visits/Training Abroad

Dr K. Venkatesan, Scientist (Economic Botany) attended training course on "Agro – Ecological Monitoring" at Amman (Jordan) from 5-13 April

Dr J.C. Tewari, Principal Scientist (Forestry) attended "Review and planning meeting for dryland systems CRP-1.1 Livelihoods – South Asia" at Dubai (UAE) from 4-6 June

Obituaries

4th June: Shri Narayan Singh, Technical Assistant

7th June: Shri Aidan Singh, SSS

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