ICAR-CAZRI

A DECADE OF NEW INITIATIVES, DEVELOPMENTS AND DEEDS

2016-2025

ICAR-Central Arid Zone Research Institute
www.cazri.res.in

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A Decade (2016-2025) of New Initiatives, Developments and Deeds

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भाकृअनुप
ICAR

CONTENTS

Foreword	i
Messages	ii
Preface	iv
Background	1
Initiatives in Research	4
Initiatives in Infrastructure Development	7
State-of-the-Art Research Farm and Facilities	26
Clean and Green Landscape of Campus	67
Connecting with Farmers	76
Production of Improved Seed and QPM	80
New Cultivars, Technologies, PoP and Patents	86
Deeds: Awards and Recognitions	109
Showcasing the Institute	119
Directors' Gallery	148

Foreword

सत्यमेव जयते

डॉ. हिमांशु पाठक
DR. HIMANSHU PATHAK
सचिव (डेयर) एवं महानिदेशक (आईसीएआर)
Secretary (DARE) &
Director General (ICAR)

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कृषि अनुसंधान और शिक्षा विभाग एवं
भारतीय कृषि अनुसंधान परिषद
कृषि एवं किसान कल्याण मंत्रालय, कृषि भवन, नई दिल्ली–110 001

GOVERNMENT OF INDIA
DEPARTMENT OF AGRICULTURAL RESEARCH AND EDUCATION (DARE)
AND
INDIAN COUNCIL OF AGRICULTURAL RESEARCH (ICAR)
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The arid regions of India represent very unique agri-production system of the country. These regions are considered as extremely challenging from farming point of view, yet are loaded with unique biodiversity and stress-adapted plant and livestock species. ICAR-Central Arid Zone Research Institute (CAZRI) has the distinction of being one of the very few institutes in the world, exclusively devoted to arid zone research and development, with an overall goal of sustainable improvement of farming in the fragile agro-climatic regions through development and deployment of suitable farming technologies in an integrated manner. The institute has tremendously contributed in making arid regions of the country more productive and resilient by generating and up-scaling suitable production technologies for field and horticultural crops with critical interventions in water and soil management.

During the past few decades, the region has witnessed remarkable changes in cropping pattern, management practices in farming, availability of irrigation water for agriculture, harnessing and utilization of solar and wind energy etc. It is essential for agricultural research institutes to take full cognizance of ongoing changes, create new development pathways and facilitate innovations to undertake research for sustainable and inclusive agricultural development. I am happy to note that the ICAR-CAZRI has made concerted efforts for taking new initiatives in research and development to cater to the present and future needs of arid regions. The institute has also been able to create modern infrastructure for conducting high-end and inclusive research.

This bulletin on decadal achievements of ICAR-CAZRI is an attempt to document the very impressive efforts in innovative research and development activities carried out by the institute in the last decade. I congratulate the Director and dedicated staff of the institute for their praiseworthy efforts during the past decade and for bringing out this publication.

(H. Pathak)

Message

भारतीय कृषि अनुसंधान परिषद,
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डॉ. सुरेश कुमार चौधरी
उप महानिदेशक (प्राकृतिक संसाधन प्रबंधन)
Dr. Suresh Kumar Chaudhari
Deputy Director General (Natural Resources Management)



The Central Arid Zone Research Institute (CAZRI), Jodhpur, a premier institute of the Indian Council of Agricultural Research (ICAR), is exclusively dedicated to research for making arid farming more productive, resilient and sustainable. The arid regions present profound challenges to agricultural production. Low and highly erratic rainfall, temperature extremes during summer and winter seasons, high wind speed especially during summer, high evapotranspiration demand, sandy soils with low water retention capacity, low organic matter content in soils and high pressure of human and livestock populations make these regions continually prone to desertification and land degradation. The Institute has carried out strategic research on understanding the processes of desertification and managing natural resources to enhance the resilience of arid production system.

Arid regions of India are currently witnessing encouraging changes in infrastructure development, irrigation network, rural electrification, tourism and education impacting the society at large. Therefore, a new surge in growth is expected due to technological interventions in farming. The situation calls for initiating new innovations in agricultural research, targeting arid regions to capture new opportunities emerging in these regions. I am happy to note that ICAR-CAZRI initiated new plans and programmes in its research agenda during the last decade to gear up the technology development process. The infrastructure of the institute has also been tremendously strengthened through both external and internal funding resources to undertake futuristic and advanced research.

It's a matter of great pleasure that a suitable bulletin is being published on the decadal achievements of the institute to highlight its impressive efforts in research and development activities during the last decade. I congratulate the entire team of dedicated staff of the institute for their outstanding efforts.

(S.K. Chaudhari)

Message

भारतीय कृषि अनुसंधान परिषद,
कृषि अनुसंधान भवन II, नई दिल्ली 110 012 भारत
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डॉ. राजबीर सिंह
सहायक महानिदेशक (एएएफ एवं सीसी)
Dr. Rajbir Singh
Assistant Director General (AAF & CC)



Arid regions constitute around 12% of the country's geographical area, which support a large number of human and livestock populations, along with rich biodiversity resources. Traditionally viewed as fragile, arid lands are emerging as key frontiers in climate adaptation, offering an abundance of climate-adapted biodiversity. Therefore, management of arid lands has been a top priority both at national and global levels. Sustainable management of arid agro-ecosystem holds the key to achieving targeted land degradation neutrality.

The ICAR-Central Arid Zone Research Institute (CAZRI), since its inception, has been comprehensively addressing all issues related to arid agro-ecosystem where hydro-climatic and edaphic constraints are further accentuated by high biotic pressure and climate change. Strategic research work conducted by the institute in the fields of agroforestry, cropping systems, plant improvement, integrated farming systems including livestock component, water harvesting and conservation, and land management has contributed in enhancing resilience of arid land farming. As a result, desertification has not only been contained but reduced marginally.

Arid areas are getting novel opportunities in farming due to increased irrigation facilities mainly through tube wells, improved transport and new infrastructure development. Looking to the projected human and livestock population for future, new innovations are required to make the arid agriculture more productive, resilient and profitable to ensure food and livelihood security of native people as well as for environmental protection.

The institute has undertaken new initiatives to create required additional infrastructure and state-of-the-art farm and laboratory research facilities to enhance the working capacity of the researchers. Refurbishment and renovations of old laboratories and other facilities have been undertaken at massive scale. Establishment of Agri-Business Incubation (ABI) Centre enabled entrepreneurship development among progressive farmers. Several new programmes have been started to reach the farming community and to enhance the delivery of improved technology at the doorsteps of farmers. The institute and its scientists have won several national level awards and recognitions.

I am very happy to note that a bulletin is planned to be published on the decadal achievements of the institute to highlight its impressive efforts in every aspect of research, development and extension activities in the last decade. I appreciate the outstanding work done by the dedicated staff of the institute during this period and wish similar success for their future endeavours.

(Rajbir Singh)

Preface

भाकृअनुप–केन्द्रीय शुष्क क्षेत्र अनुसंधान संस्थान
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Jodhpur - 342 003 (Rajasthan), India

डॉ. ओम प्रकाश यादव
निदेशक
Dr. O.P. Yadav
Director



The ICAR-Central Arid Zone Research Institute (CAZRI) is a leading institute of the Indian Council of Agricultural Research with a wide research landscape encompassing of managing natural resources; developing sustainable farming systems; improving field crops, grasses, shrubs, trees and horticultural crops; managing livestock and rangelands; and harnessing solar energy for use in agriculture and society. Through its innovative and strategic research for development in very challenging environments, the institute has been able to create a niche for itself at global level due to inclusiveness of its research programmes.

Arid regions of India are emerging as new production avenues for diverse, clean and nature-friendly cultivation. New prospects are also being perceived in the region due to overall development in all spheres of life. Giving such developments a full cognizance, the institute has embarked upon its new journey to create more innovations in arid farming. This required modern building and laboratory infrastructure, irrigation network, agricultural machinery, information systems, state-of-the-art research farm etc. Concerted efforts were made in the last decade to achieve this successfully.

Task of this magnitude was not feasible without extraordinary support from the present and past Director Generals, Deputy Director Generals (Natural Resource Management) and Assistant Director Generals of the Indian Council of Agricultural Research.

Efforts of scientists of the institute in bringing additional funding from external sources have been exceptional during the last decade. Commitments of Heads of Divisions and Regional Research Stations are of highest order. Teamwork of scientists, technicians, administration personnel and finance staff members has been the foremost force behind impactful change.

(O.P. Yadav)



Background

The arid zone of India covers about 12% of the country's geographical area, including over 31.7 m ha of hot desert and about 7 m ha of cold desert. The states of Rajasthan and Gujarat account for more than 80% of the hot arid regions, whereas states of Himachal Pradesh and Uttarakhand along with Union Territory of Ladakh constitute most part of the cold arid region.

Long-standing Challenges

Drought is a regular, severe and wide spread phenomenon in arid regions due to low (200-400 mm) and erratic (>50% CV) rainfall, impacting production and livelihood. The adverse effects of drought are further exacerbated by elevated temperature (45-50°C during summer and the rainy season), high potential evapotranspiration (1500-2000 mm) and low water retention capacity in the soil profile. Native soils are severely deficient in nitrogen and available phosphorous. Consequently, the system productivity is low, making farming highly risk-prone.

Encouraging Attributes

In contrast to their inherent challenges, arid regions possess distinct advantages. Intense solar radiation is available throughout the year. The regions are blessed with a very rich biodiversity encompassing several abiotic stress-adapted crops and a number of indigenous livestock species. Traditional knowledge in water conservation and the adoption of an integrated farming approach are integral to the culture and agriculture of these regions, helping to reduce climate-driven risks. Additionally large scale irrigation projects such as the Indira Gandhi Nahar Pariyojana (IGNP) and the Narmada Canal Project (NCP) provide irrigation across vast area.



Assenting to New Changes

Arid regions have undergone significant transformations, especially over the past two decades. Rural electrification has led to an increase in tubewells, enabling life-saving irrigation during the kharif season and supporting the cultivation of new field and horticultural crops in the rabi season. Improved road networks, tourism, education, higher incomes, and an aspiring new generation are driving social change.

Land resource utilization has also evolved considerably. The contribution of agriculture and allied sectors in arid regions indicate that crops account for the largest share followed by livestock and other allied sectors like forestry and poultry. There has been a consistent increase in the productivity of major cereals, legumes and horticultural crops, along with continuous expansion in the acreage under farming.

The Central Arid Zone Research Institute (CAZRI) is a premier research institute under the aegis of the Indian Council of Agricultural Research (ICAR), exclusively mandated to undertake research programmes relevant to the arid agro-eco-system. ICAR-CAZRI has remained responsive to the changes occurring in the region due to overall development and societal progress, particularly in the farming sector. The region is experiencing shifts in cropping system, water availability, farm diversification, efficient natural resource management, the use of solar energy in agriculture, consumption patterns of commodities and improved marketing facilities. However, new challenges are emerging, including climate change, over-exploitation of natural resources, grassland degradation, emergence of new pests and diseases, and declining interest in farming. In response, the Institute has refined its mandate to focus on strategic research on water-efficient crops, livestock, grasses and high value plants, aiming to enhance productivity, sustainability and resilience of arid production systems.



Preparing for Future

The fragile arid agro-eco-system remains under constant stress due to the growing human and livestock population, which continues to rely on the same limited land resources available since the 1950s. This situation calls for new innovations in research and development programmes to enhance the productivity, resilience, profitability and sustainability of arid production systems, with a broader goal of controlling desertification and land degradation. Over the past decade, several new initiatives have been under taken to achieve these ambitious objectives, taking cognizance of past experiences and achievements.

This document aims to capture new research initiatives enabling the institute to address present and future needs. Endeavors are also recounted in enhancing capacity of the institute for undertaking quality research; creating new varieties, technologies and products; augmenting efforts in bringing external funding; developing and managing human resource; reaching the farmers and other clientele; and improving the landscape of the campus. Furthermore, this document humbly acknowledges the recognitions and contributions of this institute during this period, reflecting its commitment to advancing arid region agriculture.

Initiatives in Research



Arid regions are undergoing a significant transition in farming, necessitating new plans and programmes to meet the evolving needs of various stakeholders. Accordingly, new research initiatives have been undertaken to advance scientific understanding, enhance productivity, and develop technologies that improve the performance and resilience of agri-production systems in arid regions. The programmes have also been strengthened to mitigate the impact of climate change on agriculture and to identify the best management practices suited to different locations.

Given that more food, fodder and fruits are vital to fulfill the need of growing human and livestock population, sustainable farming practices are essential to preserve the fragile natural resources of arid regions. In this rapidly changing landscape, monitoring of land degradation is crucial. Addressing it requires targeted technological and policy interventions.

Additionally, the development of profitable water-efficient crops, cropping systems and integrated farming models is essential to achieving the broader goal of inclusive development, long-term economic stability and improved living standards for farmers in arid areas.

Soil and Land Management

- Rapid assessment of soil properties using hyper-spectral reflectance
- Digital soil mapping and monitoring for improved resource management
- Benchmarking of state of natural resources in canal command areas
- Simulation of wind erosion and desertification processes for mitigation strategies
- Long-term research on soil fertility management for sustainable productivity
- Utilization of low-quality mining waste for developing phosphatic and potassic organo-mineral fertilizers and enriched compost

Productivity and Climate Resilience

- Development of climate-resilient and fast-growing varieties of field crops, fruits and seed spices
- Vegetable grafting using drought-hardy rootstocks
- Utilization of indigenous bio-stimulants to enhance drought resilience under protected cultivation
- Exploring the potential of new water-efficient and high value crops for arid regions
- Enhancing water productivity to improve resource-use efficiency
- Sustainable and remunerative, rainfed and irrigated integrated farming system (IFS) models for small and marginal farmers
- Development of nature-friendly package of practices

Sustainable Cultivation Practices

- Precision farming for enhanced resource-use efficiency
- Protected cultivation systems including hydroponics and aeroponics
- Sustainable green fodder production systems
- Development of commercial agroforestry systems
- Assessment of prevailing farming systems
- Identification of superior provenances of *Prosopis cineraria* and *Tecomella undulata*

Water Management and Energy Efficiency

- Exploring reflective mulches or covering materials to minimize evaporation from open water bodies
- Agri-voltaic systems integrating crop production, green energy generation, and water harvesting
- Solar powered desalination and distilled water production

Environmental and Carbon Footprint

- Quantification of Water-Energy-Food nexus in different cropping systems
- Assessment of carbon footprints of livestock
- Quantification of carbon and moisture fluxes in field crops
- Quantification of greenhouse gas emissions in protected cultivation systems

Mechanization and Modern Technology

- Increased mechanization for higher resource-use efficiency
- Designing electronic seed metering devices to achieve optimal plant density
- Designing machine vision-based grader for fruits
- Hand-held spectral sensing device for detection of adulteration in Gum Arabic
- Post-harvest processing and value-addition to local produce

Ecosystem Diversity

- Bio-prospecting novel microorganisms for agricultural use
- Documenting indigenous knowledge in the high-altitude cold desert of Ladakh
- Mapping rodent diversity in the cold arid ecosystem of Leh



Initiatives in Infrastructure Development



Infrastructural advancements are integral to developing new farming technologies for achieving sustainability and productivity goals in agriculture. Facilities for precision farming received a boost through a competitive mega-project from DST, enabling the creation of appropriate logistics such as hydroponics, aquaponics and vertical farming. These advancements allow researchers to monitor experimental conditions in real-time. Such methods enhance resource-use efficiency, optimize crop management, reduce waste and provide fresh and sustainable produce for consumers. These modern farming techniques are gaining popularity among farmers.

Access to satellite and GPS technologies, sensors, smart irrigation, drones and automation has facilitated precision agriculture, further aiding research in effective resource utilization. These technologies help researchers determine the optimal timing for planting, irrigation strategies and suitable crop types based on available resources in an ever changing climate. Future agriculture is expected to routinely incorporate sophisticated technologies such as robots, temperature and moisture sensors, aerial images and GPS technology, making agriculture more profitable, efficient, safer and more environmentally friendly.

Our scientists are continuously engaged in developing new technologies to improve the production systems in arid environments. Capturing treatment differences as small as 15% presents a tremendous challenge. Therefore, large precision fields have been developed for varietal evaluation; testing different irrigation methods; screening for biotic, abiotic and edaphic stresses; quantifying changes in microbial population in soil profile; exploring nature-friendly farming etc. that improved the quality of field research.

One of the most impactful innovations has been in farm management by outfitting tractors and other machineries with multiple attachments to suit research needs. The mechanization of maximum farm activities enabled higher manpower productivity by reducing labor requirements while livestock management has also become more efficient.

Improved seed of field crops and quality planting material of horticulture and multi-purpose trees suitable for agroforestry bring in quick and desirable changes in production system. Full land resources available with the institute were appropriately used to produce improved seed and planting material. This was made available to farmers that improved their connectivity with the institute and researchers.

New Infrastructure

- Auditorium
- Office-cum-administration Building at Regional Research Station, Leh
- Indoor Sports Complex
- Diamond Jubilee Park
- Seed Processing and Storage Unit
- Small Ruminants Research Unit
- Plant Propagation and Training Hall
- Sewage Treatment Plant
- Agri-Business Incubation (ABI) Centre
- Poly Houses, Net Houses and Green Houses
- Temperature Gradient Tunnel
- Overhead Water Tanks

Modern Research Facilities

- Development of state-of-the-art field facilities for basic and applied research, such as the Soilless Cultivation (hydroponics and aeroponics) Unit, Hi-tech Green-houses, Naturally Ventilated Polyhouses, Temperature Gradient Tunnels, Sensor-based Automated Drip-cum-Fertigation System, Wind Tunnel, Eddy Flux Tower etc.
- Developed an Integrated Farming Cafeteria to showcase proven technologies for nutritional security and environmental, social and economic sustainability
- Maximized the use of available land resources through development of dedicated research and seed production blocks
- Increased farm mechanization for higher resource-use efficiency
- Unified Livestock Housing for small and large ruminants for operational research and management, with a specialized Small Ruminants Research Unit
- New tube-wells at Regional Research Stations for research and development activities
- Construction of an overhead water tank
- Connecting experimental fields to controlled irrigation facilities
- Development of farm terraces with irrigation channels at RRS, Leh

Green Initiatives

- Smart rainwater management system for irrigation with a solar PV pumping system as well as for groundwater recharge, created through construction of farm ponds (23 lakh litres capacity)
- Establishment of the Agri-Eco-Tourism Park (AETP)
- Installation of a multi-crop solar house at Leh for storing plant saplings during winter
- Developed green spaces around the new auditorium and guest houses
- Development of a large CAZRI Colony Park
- Enhanced landscaping of the campus
- Establishment of income-generating road-side plantation

Facilities Upgrade

- Comprehensive renovation and modernization of infrastructure to establish ISO-certified, state-of-the-art laboratories equipped with high-end research equipment
- Strengthening of nursery facilities with shade nets and fogger systems
- Laying of new approach roads in the experimental farm
- Implementation of CCTV surveillance for round-the-clock security





Auditorium

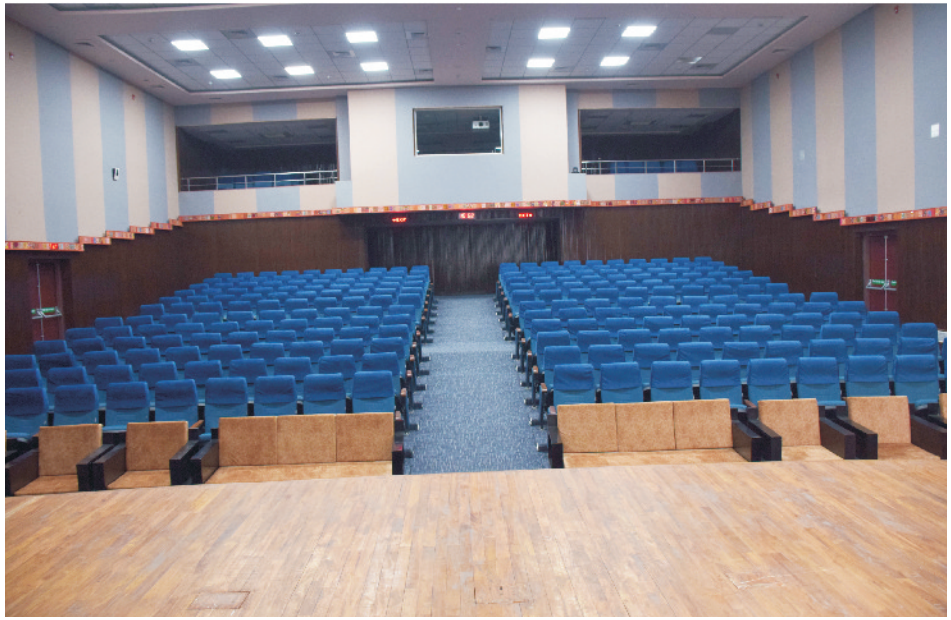


- Centrally air conditioned with a seating capacity of 270+
- Two large committee rooms
- Spacious reception lobby

- Modern audio and video facilities
- Surrounded by a striking landscape
- Project budget of Rs. 559 Lakhs









Regional Research Station, Leh

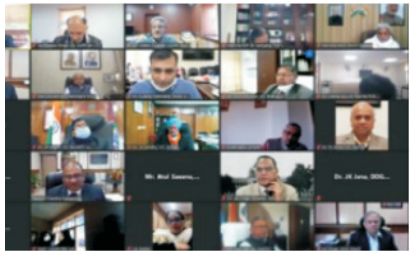


















- Among ICAR Regional Research Stations, Leh is the highest altitude station
- Exclusively mandated to comprehensively address the challenges of cold arid areas
- Centrally heated office building and laboratories
- Foundation stone laid in 2012
- Inauguration on 21st December 2020 by Sh. Narendra Singh Tomar, Hon'ble Union Minister of Agriculture and Farmers' Welfare, in the presence of Sh. Parshottam Rupala, Minister of State for Agriculture and Farmers' Welfare; Mr J.T. Namgyal, Member of Parliament from Ladakh; Dr. T. Mohapatra, Secretary DARE and DG, ICAR; and Dr. S.K. Chaudhari, DDG (NRM)

Blue Print of Development Plan of RRS, Leh



Block/ Terrace	Land Use	Block/ Terrace	Land Use	Block/ Terrace	Land Use	Block/ Terrace	Land Use
A1:1	Security hut	B1:3	Oats	B2:1	Fodder	B2:17	Fruit tree germplasm
A1:10	Automatic Weather Station	B1:4	Low tunnel/trenches	B2:2	Alfalfa	B2:18	Apricot Plantation
A1:11	Apple Plantation	B1:5	Potato	B2:3	Barley	B2:19	Apple Plantation
A1:12	Apricot Plantation	B1:6	Mustard	B2:4	Protected Structures	B2:20	Multi tier agroforestry
A1:13	Cherry	B1:7	Farm office/Solar dryer	B2:5	Water Pump/Peas	B2:21	Multi tier agroforestry
A1:14	Sports block	B1:8	Floriculture	B2:6	Vegetables Cafeteria	B2:22-23	Multi tier agroforestry
A1:17	Arboreteum	B1:9	Mini Rose Garden	B2:7	Crop Cafeteria	B2:24	Fruit tree germplasm
A1:19a	*Pinus gerardiana*	B1:13	Medicinal & Aromatic plants	B2:8	Pulses	B2:25	Alfalfa
A1:20	Silvopastoral robinia based	B1:22	Water Reservior & Salix	B2:9	Wheat	B2:26	Salix based agroforestry
B1:1	NBPGR Mustard	B1:23	Salix based agroforestry	B2:10	Maize	B2:27	Salix based agroforestry
B1:2	Mustard	B1:24	Salix based agroforestry	B2:12	Vehicle shed	B2:28	Salix based agroforestry

Winter View of Campus Road at RRS, Leh



Seed Processing and Storage Units









Diamond Jubilee Park: A Central Point of the Institute



Diamond Jubilee Pillar: A Mark of a Six-decade Impactful Journey of the Institute







- Erected to commemorate the 'Diamond Jubilee of Establishment Year' of the Institute
- Located at the centre of Diamond Jubilee Park
- Inaugurated on 1st October, 2019
- Features engraved logos of ICAR and CAZRI
- The round granite stone atop the pillar symbolizes arid regions of the world, highlighting the global relevance of the Institute's work

Indoor Sports Complex – Facility for Staff



- Badminton courts
- Table tennis courts
- Supporting logistics
- Green ambience

Small Ruminants Research Unit











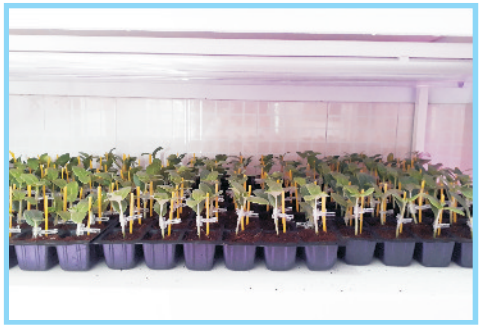
Designed to undertake research on improved nutrition and appropriate housing for sheep and goat

Plant Propagation and Training Hall

- Strategically located in the vicinity of polyhouses and nethouses
- Fully equipped to train farmers and entrepreneurs











Overhead Water Tank



Sewage Water Treatment Plant



- Created through funds of *Swachh Bharat* (Clean India)
- Minimum energy use in treating water
- Recycling of water for production of diverse fodder crops





Agri-Business Incubation (ABI) Centre



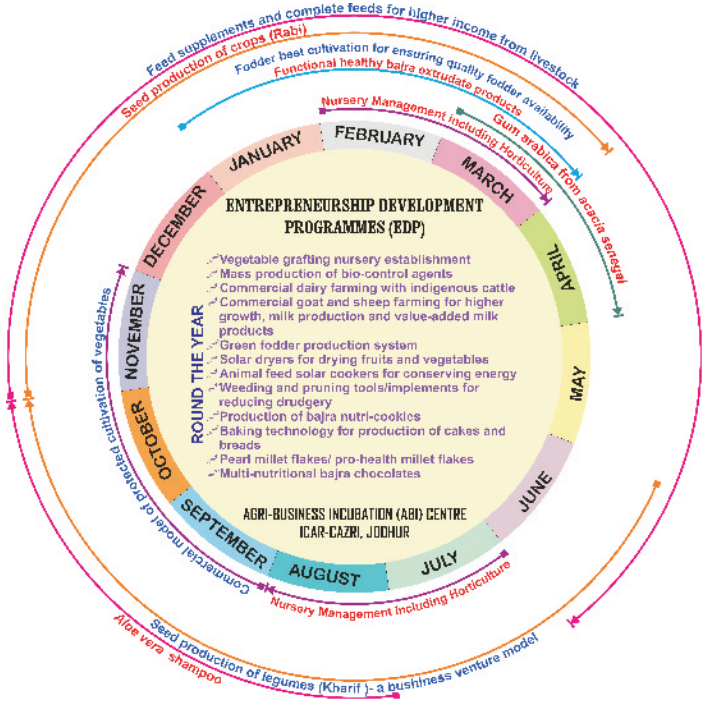
- Established in 2020
- The centre provides incubation facilities for the commercialization of potential technologies in agriculture and allied sectors
- Offers 10-30 days Entrepreneurship Development Programme (EDP) and 3-5 days Skill Development Programme (SDP)

Agri-Business Incubation (ABI) Centre









- Need-based capacity building programmes
- Flexible timings
- Creating and hand-holding entrepreneurs



Centre on Combating Desertification – Footprint of Impactful Work









State-of-the-Art Research Farm and Facilities



Integrated Farming Cafeteria

One-stop and Inclusive Demonstration of Technologies



Components of Integrated Farming Cafeteria



Field Crops



Green Fodder



Boundary Plantation (Lasora)



Fig



Silvipasture



Pomegranate



Water Harvesting + Solar PV Pump



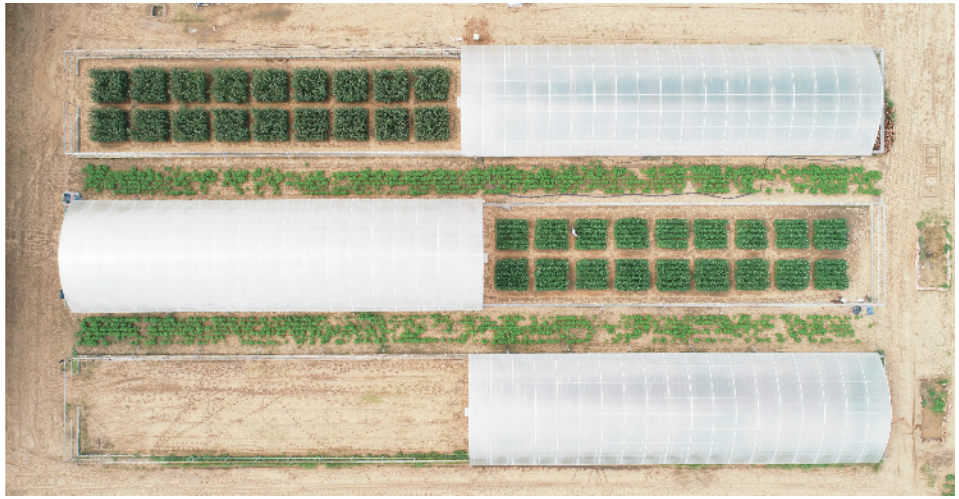
Polyhouse

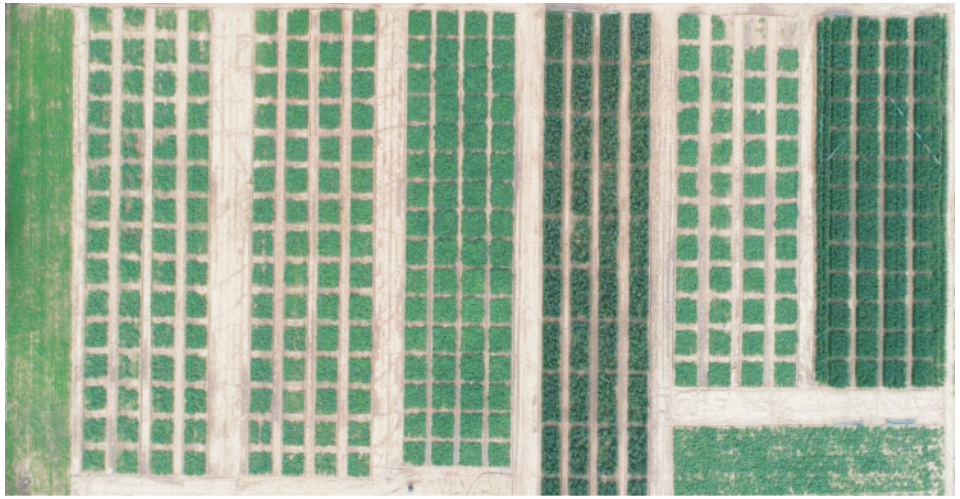
Precision Farming Block



Established on 3 ha for research, trainings and demonstrations

Precision Farming: A New Dimension in Research









- Fully automated delivery of water and nutrients
- Minimizes the environmental footprints of farming

- Maximizes profitability by reducing production costs and increasing yields
- Suitable for a range of high value vegetable and field crops

Precision Farming: A Way to Attract Youth to Farming







Precision Farming: A Way to Earn More from Less



- Right choice of crop and variety
- Appropriate management
- High profits

High Value Crops: Suitable for Aquaponic Farming



Aquaponics for Resource Efficient and Nature-friendly Farming





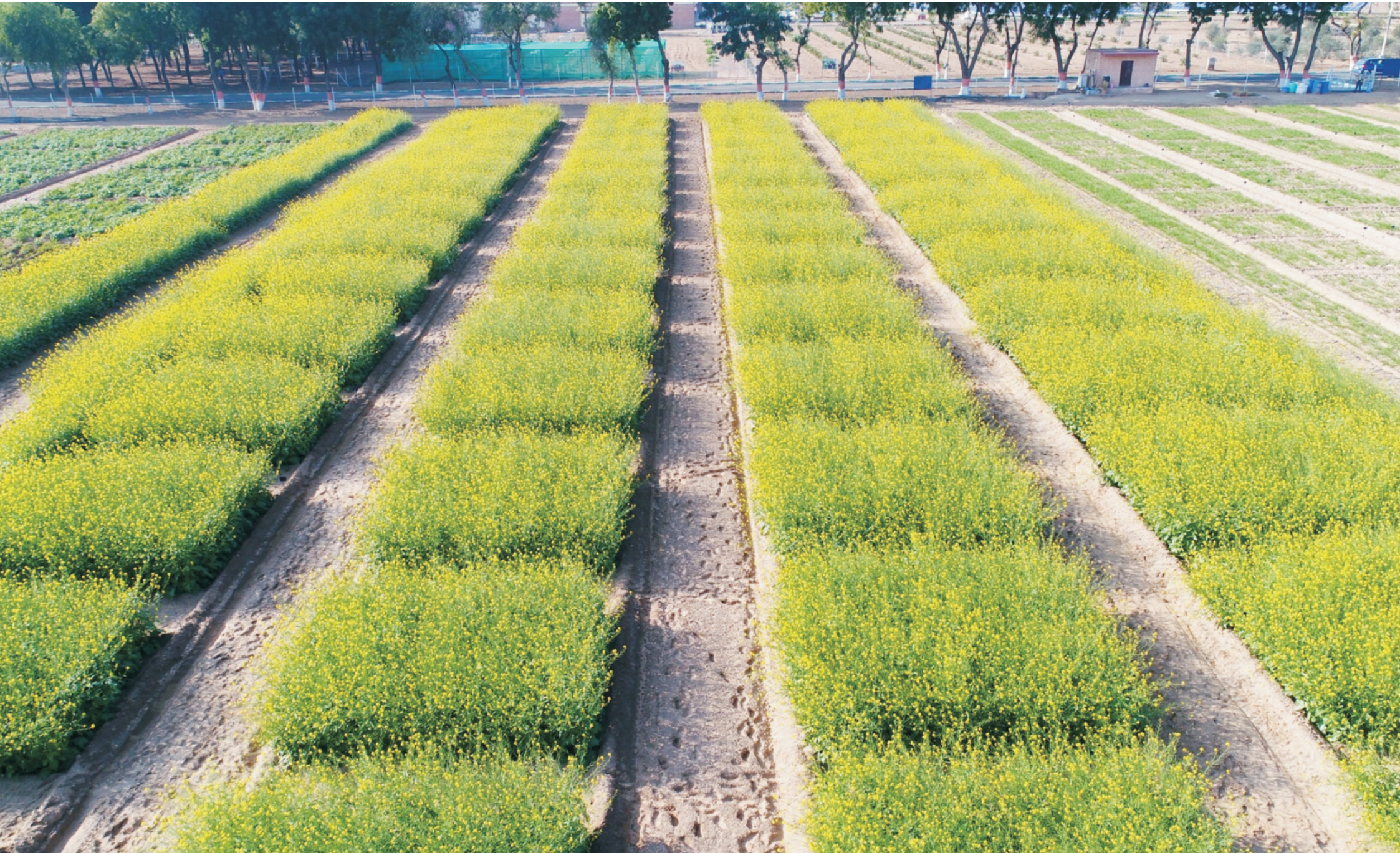


Agri-voltaic System: A New Dimension in Arid Farming



- Multipurpose use of land for electricity generation, crop cultivation and water harvesting
- Gross annual return of Rs. 20 Lakhs/ha
- Payback period: 7-8 years
- Highly relevant to the PM-KUSUM scheme

Quality Experimental Plots: A Key to Quality Research



Quality Experimental Plots on Nature-friendly Farming



Silvipasture Agroforestry to Enhance Resilience of Low-rainfall Areas



Agroforestry Model Encompassing Budded-Khejri and Mung bean



Grasses Germplasm: A Resource for Livestock-based Production System



Alternate Fodder Crops: Bridging the Gap between Demand and Supply of Green Fodder









Tissue-cultured Datepalm Plants Start Fruiting within Four Years



New Introductions in Horticulture: Augmenting Diversification




Dragon fruit


Papaya


Fig

Creating New Varieties of Crops to Achieve Greater Resilience and Higher Yields



Germplasm Evaluation: A Search for Novel Target Traits



Screening for Diseases: An Integral Part of Crop Improvement



New Varieties of Grasses: Fast Growing to Produce Higher Yields



Appropriate Combinations of Annual and Perennial Species: Fulfilling Food, Fodder and Fruit Requirements



Water Management in Pomegranate: Critical to Produce Export-oriented Fruits



Integration of Livestock in Farming: Crucial for Resilience and Higher Income



Temperature Gradient Tunnels: Examining Crop Response to Higher CO_2 Concentration







- **Automated Climate Control:** Tunnels are fully computer-controlled, allowing remote operation without manual switching
- **Simulating Future Climate:** Tunnels can replicate elevated atmospheric temperature and CO_2 levels beyond ambient conditions
- **Advanced Sensor Integration:** Tunnels are equipped with temperature and CO_2 sensors for precise environmental monitoring
- **Humidity Regulation:** A fogger system maintains optimal humidity levels, ensuring realistic plant growth conditions
- **Efficient Cooling and CO_2 Regulation:** Cool pads lower temperatures, while fans control CO_2 concentration by controlled bleeding

Artificial Wind-tunnel for Simulating Wind-erosion Process









Large-scale Solar Driers for Drying Datepalm and Ber



- **Features**
  - Retains colour and aroma
  - Drying time < 50% of open sun drying
- **Environment friendly**
  - Base area: 640 × 300 cm
- **Structural components**
  - Solar tunnel drier
  - Ultra-violet stabilized polycarbonate sheet of 6 mm thickness and drying trays
- **Loading capacity:** 500 kg
- **Approx. cost per unit:** Rs. 1,50,000
- **Thermal efficiency (η) of the dryer:** 36.6%





Post-harvest Laboratory: Established for Value Addition of Arid Produce





A Well-equipped Plant Pathology Lab: Developing Novel Disease Control Measures



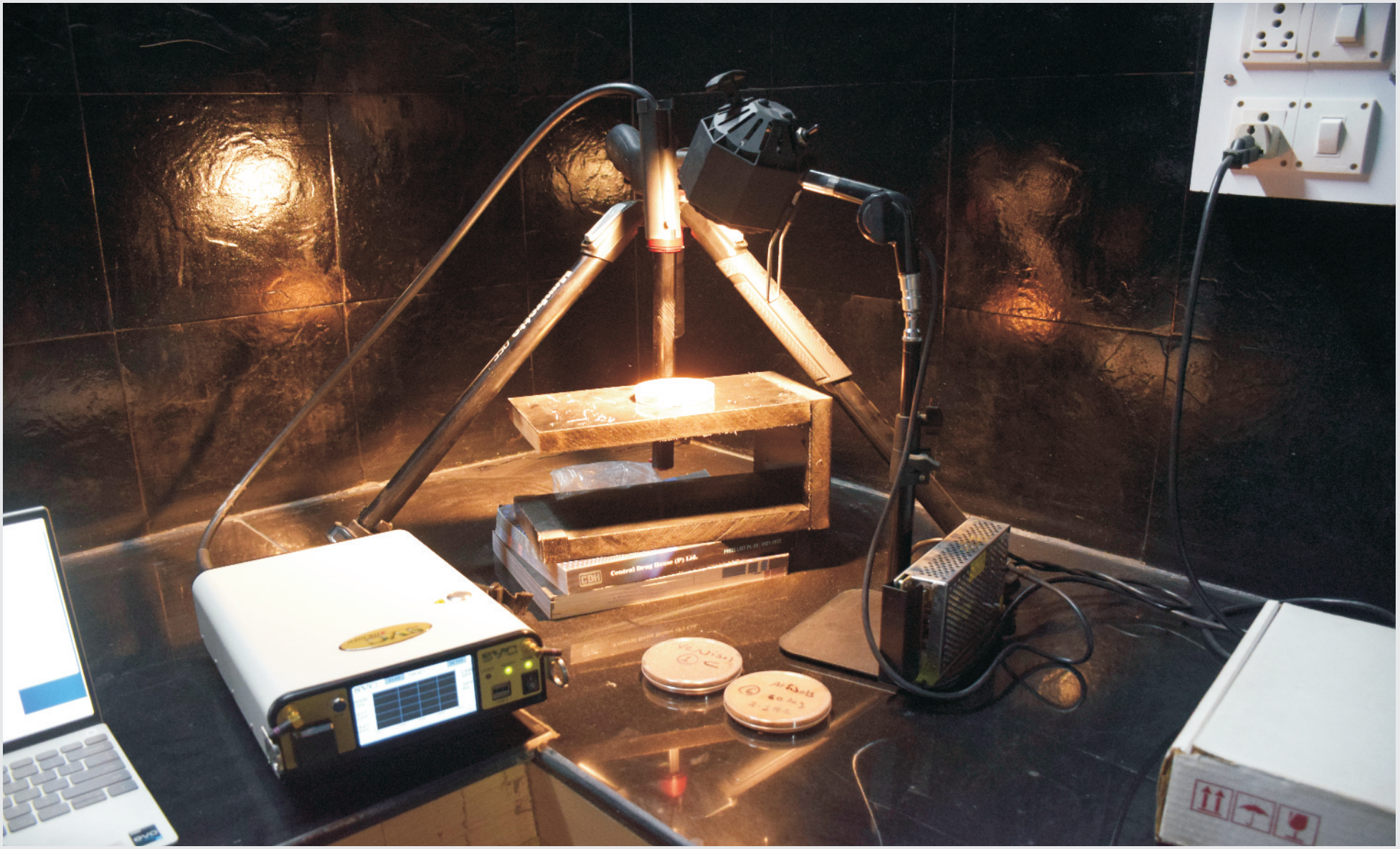
Strengthening Research at Regional Research Stations: Soil Laboratory at Pali



Renovations of Old Laboratories: Accomplished at Massive Scale



Hyper Spectral Reflectance: Fast Estimation of Soil Properties



Soil Bank: Repository of Soil Samples from Different Regions

- Information on collection site and date
- Data retrieval using barcode









Farm Ponds: Need of the Hour to Capture Run-off Water









Mechanization: Accomplishing Farm Operations Quickly and Efficiently



Mechanized Field Operations in Seed Production: Saving Money and Time



Agri-Eco-Tourism Park



A Miniature of Stabilized Sand Dune in Agri-Eco-Tourism Park



- Spread over 8 ha with 32 blocks accommodating more than 150 species of arid vegetation, including local trees, fruit trees, exotic plants, cacti, medicinal and aromatic plants
- The sand dune block showcases the overview of checkerboard technique of sand dune stabilization developed by CAZRI

Agri-Eco-Tourism Park: A Very Unique and Educative Spot



Indigofera block



Demonstration block of soils



Grasses block



Rare plants of Thar desert conserve soil and harbour unique microflora in their rhizosphere

Flora and Fauna at Agri-Eco-Tourism Park













Clean and Green Landscape of Campus



Cacti-Corner: Capturing the Beauty of Cacti



ICAR Logo at a Central Point: A Motivational Place



Thar International Guest House: Providing a Great Aura to Guests and Visitors



Green and Clean Institute



Clean and Green Landscape of the Institute



CAZRI Colony Park: A Place for Get-Together









Plantation Block



- A dedicated block for planting saplings by distinguished visitors, as a token of remembrance and to promote environment awareness
- Plantations have been carried out by Hon'ble Vice-Presidents, Union Ministers, Director Generals, Deputy Director Generals, Committee Chairmen and other esteemed visitors

Rooftop Solar Panels: An Initiative to Produce Green Energy





- Panels installed on 6 buildings with a total capacity of 375 kWp
- Years output: 543666 kWh
- Annual saving of Rs. 18,55,896
- Pay back period: 6.07 years

Connecting with Farmers



Farmers: The Ultimate Clientele is at the Forefront of the Institute



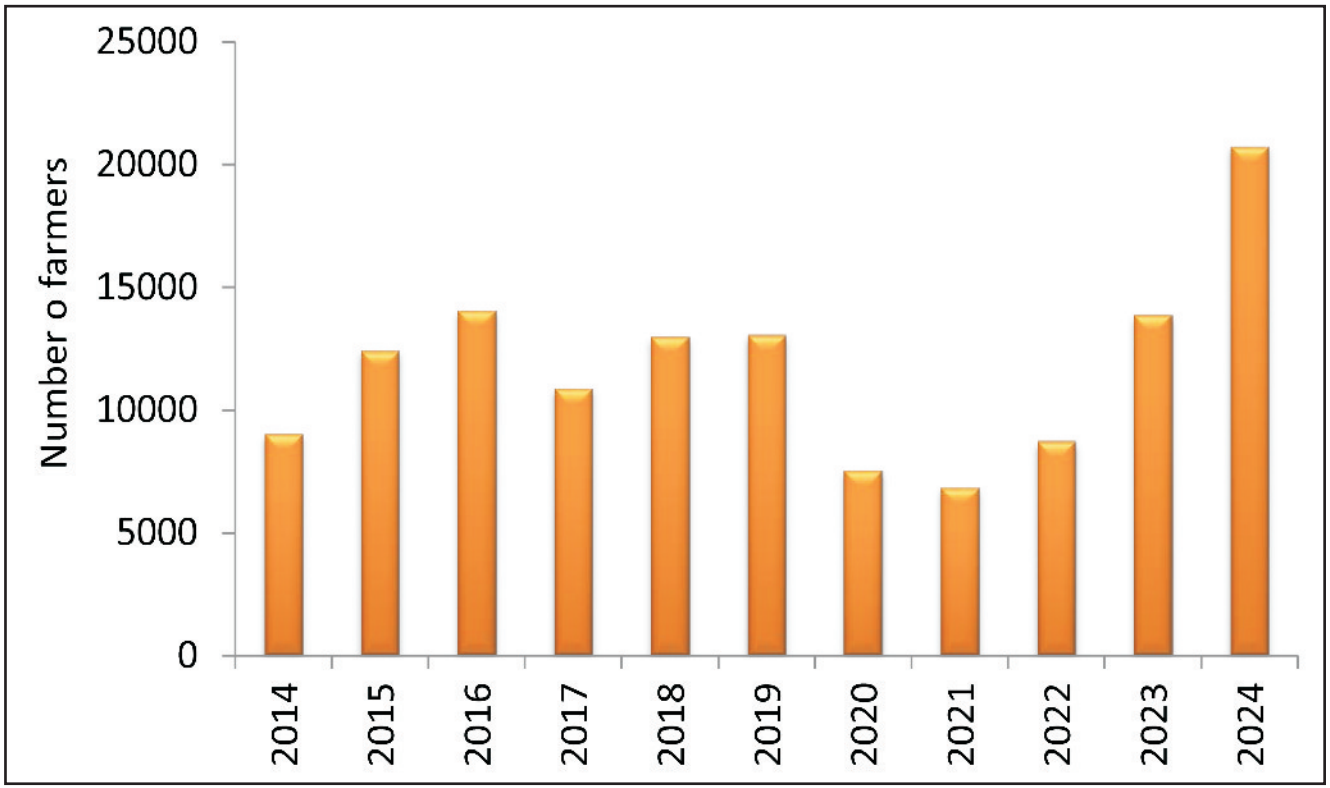








Farmers Come to the Institute with a Purpose



- To get acquainted with new technologies in farming
- To purchase crop seeds
- To purchase quality planting material
- To get training
- To participate in Kisan Melas and Innovation Days









CAZRI Kisan Mitra: Voices of the Institute

Sh. Lalit Choudhary
Precision farming and protected cultivation


Sh. Satta Ram Choudhary
Arid horticulture using rain water harvesting


Sh. Mohan Ram Saran
Diversified farming, gum exudation and FPO


Sh. Jai Ram Prajapat
Improved crop and livestock production technologies


Sh. Om Giri
Integrated farming system and use of solar gadgets


Sh. Govardhan Ram
Enterprise diversification


Smt. Vimla Siyag
Cultivation and value addition of fruits and vegetables


Sh. Jetha Ram
Soil and water conservation and arid horticulture


Sh. Jethu Singh
Arid horticulture through modern techniques


Sh. Deda Ram
Entrepreneurship in farming


Sh. B.L. Suthar
Improved farming practices


Sh. Mala Ram
Resource conservation and farming diversification


Captain Babu Khan
Integrated farming and nursery for fruits and agroforestry


Sh. Vijay Singh
Livestock-based farming system


Sh. Ramchandra
Cultivation of vegetables, water harvesting and protected cultivation


Sh. Govind Ram
Seed production and marketing


Sh. Gordhan Singh
Converting barren land into productive farming


Sh. Tarachand
Arid fruits-based farming


(Late) Sh. Idana Ram
Integrated farming system


Sh. Bhyian Ram
Diversification of farming


Sh. Paburam Patel
Dairy entrepreneurship


Smt. Zainab Parveen
Diversified farming and commercial vegetable nursery in Leh


Sh. Arjun Ram
Water management through micro irrigation


Sh. Hari Singh
Promoting agroforestry system


Sh. Ratan Lal Daga
Certified organic and diversified farming


Sh. Premji Bhai Velji Bhai Vekariya
Commercial drumstick cultivation


Sh. Sita Ram
Improved nursery of fruits, vegetables and agroforestry trees


Smt. Meera Devi
Diversified farming


Sh. Champa Lal
Commercial seed production


Sh. Raju Ram
Rainwater based fruits orchard


Production of Improved Seed and QPM



Production of Foundation and TFL Seed: Strengthening Seed Chain



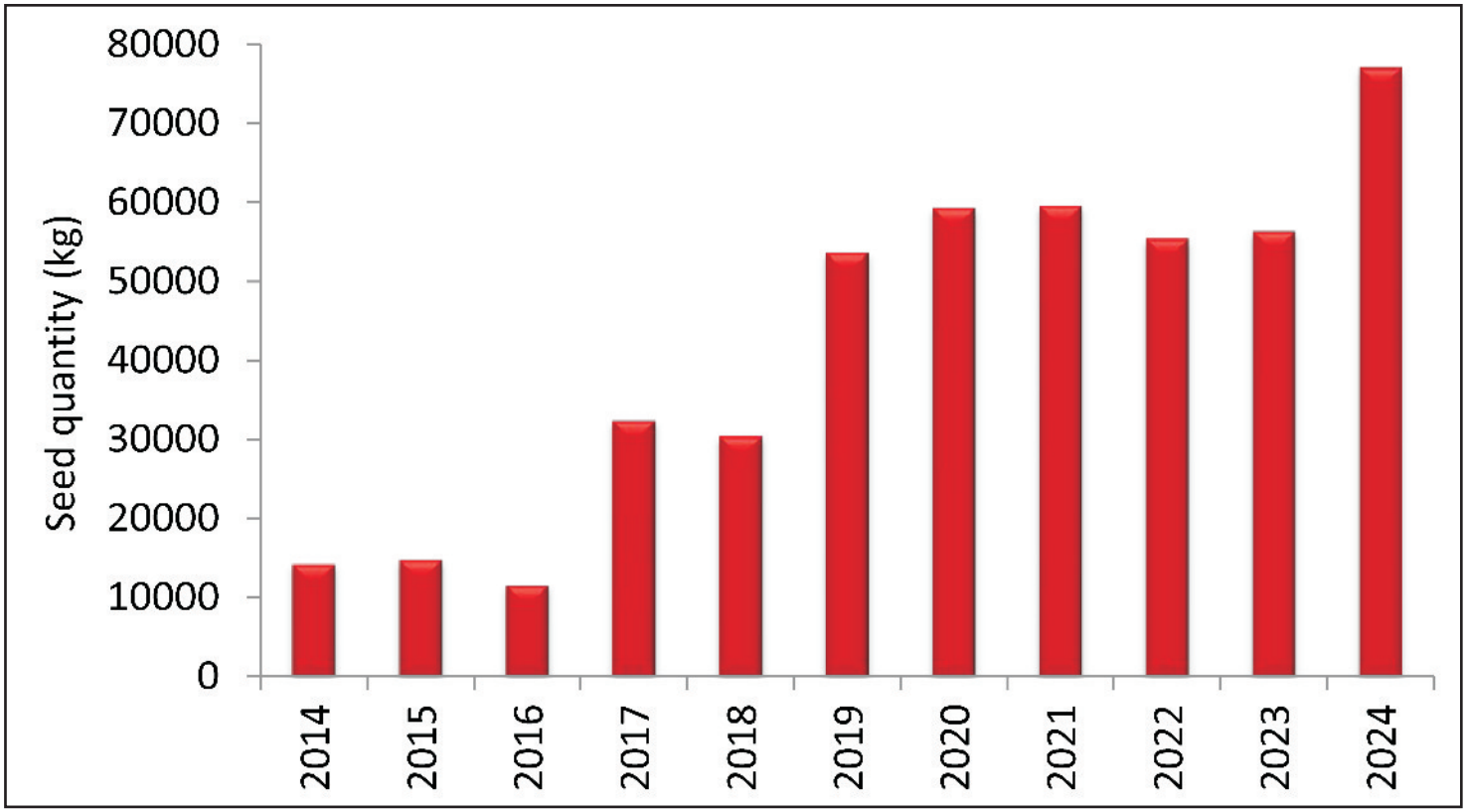
Production of Improved Crop Seed: A Good Way to Use Land and Generate Resources



Use of Improved Seed of Cumin: Keeping Diseases Low and Profits High



Empowering Farmers through Improved Seed



Target crops

- Mung bean
- Clusterbean
- Moth bean
- Cumin
- Methi
- Mustard
- Anjan grass
- Dhaman grass
- Sewan grass

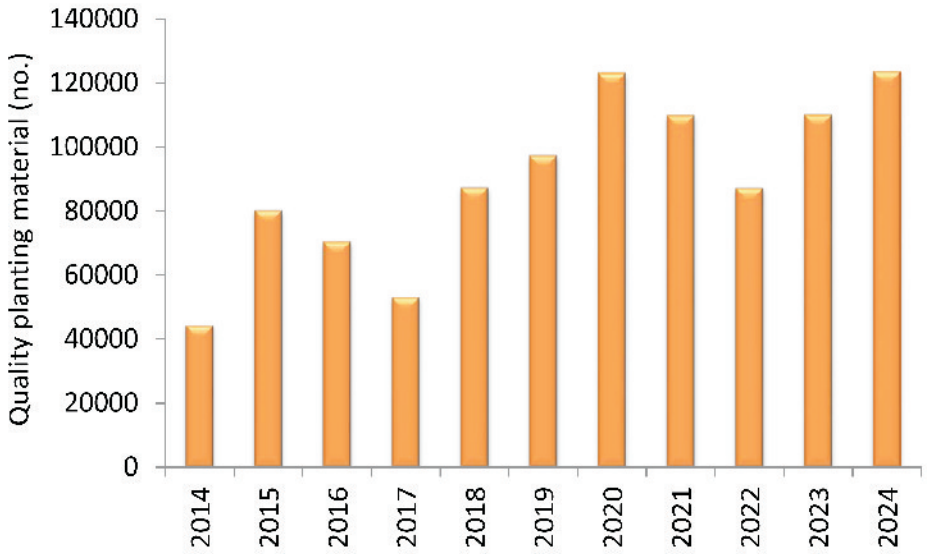




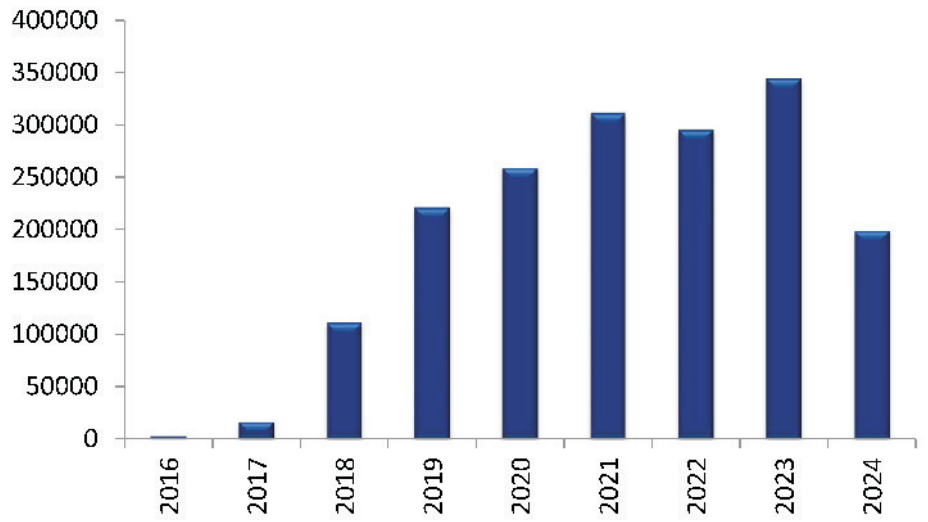


Central Nursery: A Point of Sale of Quality Planting Material

Ber, Pomegranate, Gonda, Karonda, Lemon, Budded Khejri, Desi Khejri Rohida, Kumat, Ardu



Napier Bajra Hybrid Grass Cutting (no.)







New Cultivars, Technologies, PoP and Patents



Moth bean Variety: CAZRI Moth – 4



- Average seed yield 596 kg/ha
- Potential grain yield is 1192 kg/ha
- Seed contains 32.8% protein
- Variety remains green up to maturity
- Notified by Govt. of India (S.O. 1560(E) dated 26th March 2024) for all moth bean growing areas





Moth bean Variety : CAZRI Moth–5





- Average seed yield 585 kg/ha
- Potential grain yield 1067 kg/ha
- It has shown resistance against all foliar and root diseases
- Notified by Govt. of India (S.O. 1560(E) dated 26th March 2024) for all moth bean growing areas



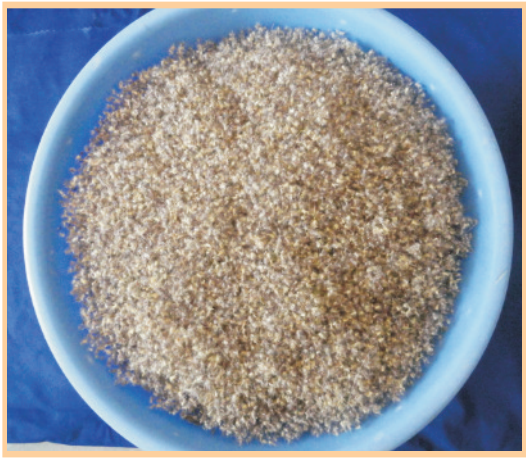
Buffel Grass Variety: Anjan-2178







- Average fodder yield 108.4 q/ha
- Average dry matter yield 38.4 q/ha
- Fast growth and better establishment
- Pale yellow foliage during initial growth
- Released for Rajasthan vide notification no. S.O. 1379(E) dated 27-3-2018



Buffel Grass Variety: CAZRI Anjan 358









- Average fodder yield 84.1q/ha
- Average dry matter yield 20 q/ha
- Released for Rajasthan vide notification no. S.O. 1379(E) dated 27-03-2018

Sewan Grass Variety: CAZRI Sewan-1



- Average fodder yield 156.8 q/ha
- Average day green fodder 2.29 q/ha
- Released for Rajasthan vide notification no. S.O. 1379(E), Ministry of Agriculture and Farmers' Welfare dated 27-03-2018



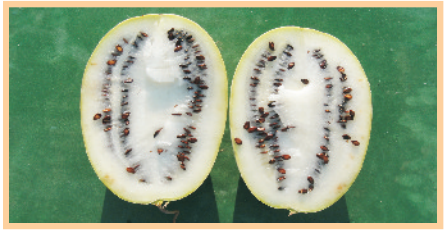


Seed-purpose Water Melon Variety: CAZRI Kalingada-1 (CAZJK-13-2)













- Fruit yield of 125-150 q/ha
- Seed yield of 350-450 kg/ha under rainfed conditions
- Seed contains 28-30% oil
- First female flower opens 35-40 days after sowing and matures in 90-95 days
- Notified by Govt. of India vide S.O. 6318(E) dated 26 December 2018 for all arid regions of Rajasthan and Gujarat

Cumin Variety: CAZRI Cumin 1 (CZC 135)





- Average grain yield 522 kg/ha, 12.3% higher over check GC 4 (469 kg/ha)
- Tolerant to *Fusarium* wilt
- Essential oil in seed is 4.25%
- Matures in 120-130 days
- Identified for release during the Annual Group Meet of AICRP on Spices (October 15-17, 2024) for cultivation in all cumin growing areas of Rajasthan

Moth bean Variety: CAZRI Moth – 6 (CZMO-18-3)







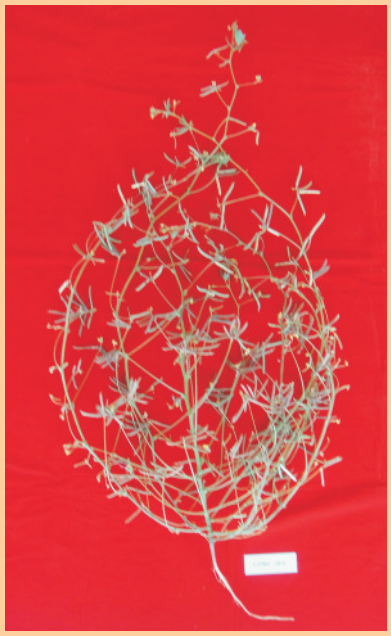
- Average seed yield 628 kg/ha
- Potential seed yield 1422 kg/ha
- Stability in yield performance
- Identified for release during the Annual Group Meet of AICRP on Kharif Pulses (May 27-29, 2024) for cultivation in all moth bean growing areas

Moth bean Variety: CAZRI Moth – 7 (CZMO-18-4)



- High seed yield 652 kg/ha
- Potential seed yield 1623 kg/ha
- Resistance against YMV
- Has wider adaptability and better stability in yield
- Identified for release during the Annual Group Meet of AICRP on Kharif Pulses (May 27-29, 2024) for cultivation in all moth bean growing areas







Pomegranate Variety: CAZRI Vishal

- Spacing: 4 x 4 m
- Propagation Method: Hard wood cutting
- Yield: 22 kg/plant
- Developed by hybridization between Ganesh and Khog
- Suitable for irrigated conditions of western Rajasthan
- Fruit extra large and attractive
- Fruit colour: Reddish yellow
- TSS: 17.5-18.6% with low acidic juice (0.48-0.52%)
- Fruit maturity is earlier by 15-20 days than the Bhagwa variety with bigger fruit size







Ber Variety: CAZRI Gola





- Spacing: 6 x 6 m
- Method of propagation: Budding
- Fruit yield: 60 kg/plant (rainfed conditions)
- High yielding
- Early maturing
- Mean fruit weight: 19.26 g
- Mature fruit colour: Greenish yellow
- Fruit shape: Round
- Pulp:stone ratio: 12.33
- TSS: 18.83° Brix
- Vitamin 'C' content: 50.73 mg/100 g
- Provides about 25% higher yield than Gola variety under rainfed conditions
- Fruits mature earlier than Gola by 10-12 days

Karonda Variety: Maru Gaurav





- Spacing: 5 x 5 m
- Method of propagation: Seed/Budding/Air Layering
- Yield per plant: 35-40 kg
- Improved high yielding variety developed by selection
- Air layered or budded plants start flowering and fruiting in second year of plantation
- The peak flowering is during March-April with fruit set during April
- Fruits mature during August-September
- The average fruit weight is 3.74 g with 88.5% pulp, 9.4° Brix TSS and 2.8% acidity

Gonda Variety: Maru Samridhi

- Spacing: 6 x 6 m
- Propagation method: Budding
- Mean Fruit yield (5 years onwards): 80 kg/plant
- High yielding variety of Lasora developed by selection
- Mean fruit weight: 10.5 g
- Mean bunch weight: 61.5 g
- Mean number of fruits/bunch: 14
- Pulp:stone ratio: 6.5
- Seed-propagated plants start flowering and fruiting in fifth year of planting while budded plants start flowering and fruiting in third year
- The peak flowering is during February-March and fruiting during March-April





Karonda Germplasm: CAZRI Sadabahar (CZCM-2001)

- Registered germplasm
- Spacing: 5 x 5 m
- Method of propagation: Seed/Budding/Air Layering
- Yield per plant: 28 kg
- Bears flowers and fruits thrice in a year
- Fruit characters:
  - Length: 2.12 cm
  - Girth: 1.52 cm
  - Shape: Ovoid
  - Fruit colour: Pink on sun-faced side and creamy white on the other side
  - Mean weight: 3.5 g
  - Number of seeds/fruit: 5
- Early fruit maturity: 100-120 days
- Mean fruit yield: 28.25 kg/plant
- Canopy area: 7.45 m^2, can be grown as pure crop or as live protective fence around the orchard
- TSS-9.4° Brix, Vitamin 'C' 32.35 mg/100 g, DM-12.85%





Cumin Germplasm: CZC-94

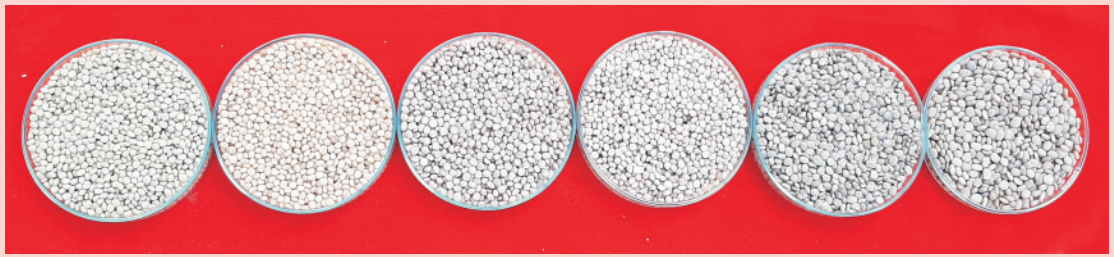






- Flowering only in 42-45 days
- Maturing in 100-105 days
- Registered with ICAR-NBPGR (INGR 21167)
- Best tested in AICRP as a potential new climate resilient cumin variety

Clusterbean Germplasm: CAZG 109







- Seed test weight > 45 g
- Seed per pod: 9
- Pod length: 12 cm
- Pod width: 9.5 mm
- Registered with ICAR-NBPGR (INGR 23049)



Innovative Technologies Approved by ICAR

SN	Technology	Developers
1	Integrated management of nematodes in pomegranate orchard	Dr. Akath Singh, Dr. Pratap Singh S. Khapte, Dr. Pradeep Kumar
2	Suitable protected cultivation structure for arid region vegetable production	Dr. P.S. Khapte, Dr. Pradeep Kumar, Dr. Anurag Saxena Dr. Akath Singh
3	Vegetable grafting for sustainable protected cultivation of cucumber	Dr. Pradeep Kumar, Dr. P.S. Khapte, Dr. Anurag Saxena, Dr. R.K. Singh Dr. Uday Burman, Dr. Nav Raten Panwar
4	Suitable rootstocks based sustainable greenhouse tomato production under limited water conditions	Dr. Pradeep Kumar, Dr. Pratap Singh S. Khapte, Dr. Anurag Saxena Dr. R.K. Singh, Dr. Uday Burman, Dr. Akath Singh
5	Round the year fodder production from Napier hybrid-based system in arid regions	Dr. R.N. Kumawat, Dr. M. Patidar, Dr. B.K. Mathur
6	Livestock-based rainfed Integrated Farming System Model for arid zone (4 ha)	Dr. S.P.S. Tanwar, Dr. B.K. Mathur, Dr. M. Patidar, Dr. Akath Singh
7	Production technologies for growing fodder beet	Dr. S.P.S. Tanwar, Dr. B.K. Mathur, Dr. Dheeraj Singh Dr. Subhash Kachchhwaha
8	Irrigation and nitrogen management in Indian mustard for arid region	Dr. V.S. Rathore, Dr. N.S. Nathawat, Dr. M.L. Soni
9	Felsnite-An indigenous potassic Organo-Mineral Fertilizer	Dr. Praveen Kumar, Dr. Nav Raten Panwar, Dr. Ramesh Chand Kasana Dr. Uday Burman, Dr. Saritha M.
10	Rocknite-An indigenous phosphatic Organo-Mineral Fertilizer	Dr. Praveen Kumar, Dr. Nav Raten Panwar, Dr. Uday Burman Dr. Saritha M.
11	Agrivoltaic system (AVS) for food production, photovoltaic (PV) generation and rainwater harvesting from a single land unit	Dr. Priyabrata Santra, Dr. Surendra Poonia, Dr. H.R. Meena Dr. N.K. Jat, Dr. Dilip Jain, Dr. R.K. Singh, Dr. R.N. Kumawat
12	Decentralized and integrated approach of seed availability to sustain agriculture under saline agroecosystem of Pali arid zone	Dr. Dheeraj Singh, Dr. M.K. Chaudhary, Dr. Chandan Kumar Dr. Ranjay K. Singh

Innovative Technologies Approved by ICAR

SN	Technology	Developers
13	CBG: The best performing cactus pear accession in arid Kutch, Gujarat	Dr. Anandkumar Naorem, Dr. Devi Dayal
14	Green biosynthesis of copper oxide nanoparticles	Dr. Ramesh Chand Kasana, Dr. Nav Raten Panwar Dr. Uday Burman, Dr. Praveen Kumar
15	Multi-trait plant growth promoting rhizobacteria for enhancing drought resilience in clusterbean	Dr. Ramesh Chand Kasana, Dr. Saritha M. Dr. Nav Raten Panwar, Dr. Uday Burman, Dr. Praveen Kumar
16	Clodinafop-propergyl + sodium acifluorfen: An efficient and safe alternative herbicide to imazethapyr for dominant mung bean/moth bean - mustard cropping system in hot arid regions	Dr. N.K. Jat, Dr. D.V. Singh
17	Inhibition of flowering of Henna (*Lawsonia inermis* L.) through plant growth regulators for enhancing productivity and quality	Dr. M.B. Noor Mohamed, Dr. A.K. Shukla, Dr. Keerthika A. Dr. Dipak Kumar Gupta
18	A common platform technology for green synthesis of multiple nanoparticles	Dr. Nav Raten Panwar, Dr. Saritha M., Dr. Praveen Kumar Dr. Uday Burman
19	Rejuvenation of Ganoderma infected Khejri through bio-control agents	Dr. Ritu Mawar, Dr. Bhagwan Singh
20	Integrated dust detection algorithm using MODIS and INSAT-3D satellite data for detecting dust load in atmosphere	Dr. Priyabrata Santra
21	Process for extraction of polysaccharide from ripened Cordia myxa fruit	Dr. Saurabh Swami, Dr. P.R. Meghwal, Dr. Akath Singh Dr. Om Prakash, Dr. Mahesh Kumar
22	Farmers field school for field agriculture under saline conditions of arid zone	Dr. Dheeraj Singh, Dr. M.K. Chaudhary, Dr. Chandan Kumar
23	Intricacy of traditional food Panchkutta for social ecological systems and food security in arid zone of Thar desert	Dr. Dheeraj Singh, Dr. M.K. Chaudhary, Dr. Chandan Kumar Dr. Aishwarya Dudi, Dr. Ranjay K. Singh
24	Ensuring seed availability at local level through seed village under saline conditions of arid zone	Dr. Dheeraj Singh, Dr. M.K. Chaudhary, Dr. Chandan Kumar

New Package of Practices

SN	Package
1	Rainfed Integrated Farming System for arid zone
2	Sprinkler irrigation at ET_c 0.8 is suitable for getting better yield and water productivity of groundnut in Bikaner region
3	Standardized irrigation and nitrogen application rates for optimizing yield and water productivity of wheat in hot arid region
4	Deep tillage and application of FYM@ 5 t ha^{-1} are suitable to get higher yield of wheat and Indian mustard in Bikaner region
5	Under late and very late (15-30 November) conditions of arid zone of western Rajasthan NPJ-93 and NRCDR-2 cultivars of Indian mustard are suitable for terminal heat stress in Bikaner
6	Year-round fodder production sequences under limited irrigation
7	Fodder beet: A high yielding nutritious fodder
8	Developed alternative cropping systems (clusterbean-isabgol and clusterbean-Indian mustard) for enhancing economic profitability and ground water saving than conventional clusterbean-wheat cropping system
9	Rain water harvesting based integrated agricultural production system for hot arid region
10	Organic production technology of sesame
11	Organic production technology of mung bean
12	Mustard variety Giriraj was found suitable under crop sown in last week of October under higher temperature condition in Bikaner region
13	Agri-horti-pasture system with drip irrigation system
14	Agri-horti-pasture system techniques for rainfed and partially irrigated condition
15	Application of irrigation at 70% ET and 120 kg N ha^{-1} is suitable to get better yield and water productivity of Indian mustard in Bikaner region
16	Agri-horti systems under sprinkler irrigation
17	Foliar application of salicylic acid @ 0.5 mM at 45 and 65 DAS is effective to get better yield of Indian mustard under water deficit condition in Bikaner region
18	Ber based production system (1 ha) for Transitional plains of Luni basin
19	Pomegranate based production system (1 ha) for Transitional plains of Luni basin
20	Standardized agronomic practices for rainfed taramira production for effective utilization of retreating monsoon rainfall
21	Optimizing production of Lasora (*Cordia myxa* L.) under different defoliation methods
22	Chickpea varieties GNG-469, RSG-973 and RSG-931 are suitable for terminal heat stress in Bikaner zone
23	Chickpea varieties RSG-945, GNG-1958 and RSG-888 are suitable for water stress condition in Bikaner region
24	Mustard varieties RH-725, CS-50 and RGN-298 are suitable for water stress condition in Bikaner region
25	Integrated Pest Management for castor crop

Patents for Innovative Research

SN	Patent	Inventors
1	Jaisalmeri preserve and candy from fruit of toosh (*Citrullus colocynthis*)	R.N. Kumawat, S.S. Mahajan, R.S. Mertia
2	Preparation and method of processing of Aloe candy from aloe species	M.M. Azam, P.R. Meghwal
3	A novel method for isolating aloin by extraction from yellow sap of Aloe vera	M.M. Azam
4	Nano-induced bacterial polysaccharide production	J.C. Tarafdar, Ramesh Raliya, Praveen Kumar
5	A process for synthesizing a multi-nutrient organic manure	Praveen Kumar
6	Bio Formulation of a bio-pesticide and a process for preparing the same	Satish Lodha, Ritu Mawar
7	Biosynthesis of metal nano particle from fungi	J.C. Tarafdar
8	Development of nano-induced biological phosphorous fertilizer (NB-PHOS) using *Aspergillus flavus* CZR-2	J.C. Tarafdar
9	Consortium of bio-pesticide and bio-formulation comprising same	Satish Lodha, Ritu Mawar
10	Compacted compost-gypsum blocks	Praveen Kumar, H.C. Bohra, N.V. Patil
11	Rapid synthesis of platinum nanoparticle from *Aspergillus flavus* TFR-12	J.C. Tarafdar
12	Felsnite- an organo-mineral fertilizer of potassium produced from low grade potassium feldspar	Praveen Kumar, N.R. Panwar, R.C. Kasana U. Burman, Saritha M., V.S. Tanwar
13	Process for synthesis of organo mineral fertilizer of potassium	Praveen Kumar, N.R. Panwar, R.C. Kasana U. Burman, Saritha M., V.S. Tanwar
14	Rocknite- an organo-mineral fertilizer of phosphorus produced from low-grade rock phosphate	Praveen Kumar, N.R. Panwar, U. Burman Saritha M., V.S. Tanwar
15	A novel process for synthesis of organo-mineral fertilizer of phosphorus	Praveen Kumar, N.R. Panwar, U. Burman Saritha M., V.S. Tanwar

Value Added Products



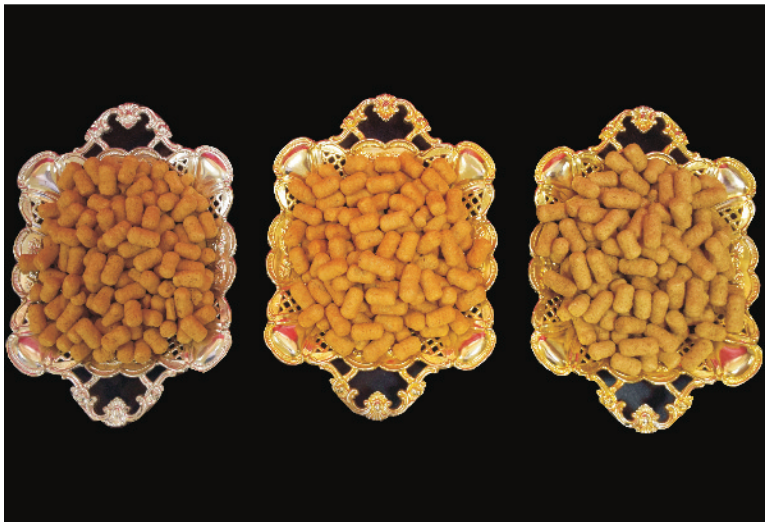
Millet Cookies



Bajra Chocolate



Bajra Mathri



Bajra Kurkure

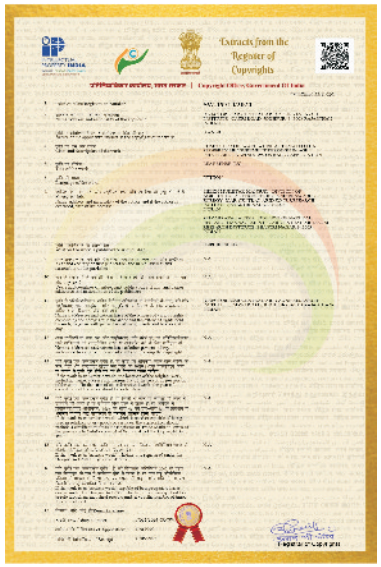


Bajra Kurkure marketed by ABI-trained entrepreneur

Protecting the Intellectual Property Rights







- Tagline of the institute is registered. It consists of three parts viz. 'Institute Logo', abbreviated name of the institute i.e. 'CAZRI' and line on vision of the institute i.e. 'Enhancing Resilience of Arid Lands'
- Mobile App 'CAZRI Krishi' is created to provide latest technical information on arid farming
- Copyright of Software 'Leaf Sense: Automated Leaf Property Measurement Using Image processing' (Registration no. SW-19713/2024)

DEEDS

Awards and Recognitions

ICAR Excellence Award – Best Institute Award



Sardar Patel Outstanding ICAR Institution Award

- For conducting multi-disciplinary research
- For seeking solutions to the problems of arid region of India
- To undertake integrated research for higher productivity, greater resilience and continued sustainability





Indian Council of Agricultural Research

Certificate

SARDAR PATEL OUTSTANDING ICAR INSTITUTION AWARD–2017

(For Large Institute Category)

is presented to

ICAR-Central Arid Zone Research Institute

Jodhpur, Rajasthan

5 March, 2019
New Delhi

(T. Mohapatra)
Secretary (DARE) &
Director General (ICAR)

(Radha Mohan Singh)
Minister of Agriculture & Farmers Welfare
Govt. of India

Rafi Ahmed Kidwai Award



Indian Council of Agricultural Research

National Award for Excellence in Agricultural Research

RAFI AHMED KIDWAI AWARD
FOR OUTSTANDING RESEARCH IN
AGRICULTURAL SCIENCES
(Crop & Horticultural Sciences)

is presented to

Dr. Om Parkash Yadav

Director
ICAR–Central Arid Zone Research Institute
Jodhpur, Rajasthan

16 July, 2021
New Delhi

(T. Mohapatra)
Secretary (DARE)
Director General (ICAR)

(Narendra Singh Tomar)
Union Minister of Agriculture & Farmers Welfare
Govt. of India



Conferred to Dr. O.P. Yadav, Director

- Outstanding Research in Crop Sciences
- Development of high yielding, climate resilient and biofortified cultivars of crops
- Reorientation of the crop breeding activities for drought-prone areas including changes in objectives, base material for breeding and approaches for selection
- Adaptation mechanism of crops to water stress conditions
- Persuasive and innovative leadership in research management

ICAR Excellence Awards



Vasantrao Naik Award for Outstanding Research Application in Dryland Farming Systems

- Drs. S.P.S. Tanwar, Akath Singh, M. Patidar, B.K. Mathur and Praveen Kumar



Rajshri Tandon Rajbhasha Award

- ICAR-CAZRI, Jodhpur
- Undertaking thoroughgoing work in Rajbhasha (Hindi) at Institute



Fakhruddin Ali Ahmed Award for Outstanding Research in Tribal Farming Systems

- Drs. Anurag Saxena, Sanjeev Chauhan and M.S. Raghuvansi



Best Annual Report Award

- ICAR-CAZRI, Jodhpur
- Highlighting and presenting research and development outcomes for arid zone of India in notable way for easy understanding of stakeholders



Pandit Deen Dayal Upadhyay Krishi Vigyan Protsahan Puraskar (Zonal)

- CAZRI-KVK, Pali
- Innovative extension approaches by creating linkages among farmers



KRISHI Portal

- ICAR-CAZRI, Jodhpur
- Outstanding contribution to Knowledge based Resources Information Systems Hub for Innovations in agriculture (KRISHI) Portal

ICAR Excellence Awards



Swami Sahajanand Saraswati Outstanding Extension Scientist Award

- Dr. Dheeraj Singh
- Contribution to introduction of promising varieties of spices, vegetables, fruits and their popularization resulting in increase in productivity
- Conservation and registration of local germplasm of kharchia wheat
- 2015



ICAR Lal Bahadur Shastri Young Scientist Award

- Dr. P. Santra
- Outstanding Young Scientist Award for the Natural Resource & Agricultural Engineering Category
- 2017



ICAR Jawaharlal Nehru Award for Outstanding Doctoral Thesis Research

- Dr. Saritha M.
- Outstanding Doctoral Research work in Natural Resource Management
- 2017



ICAR Jawaharlal Nehru Award for Outstanding Doctoral Thesis Research

- Dr. Dipak Kumar Gupta
- Outstanding Doctoral Research work in Natural Resource Management
- 2016



Dr. K.A. Shankarnarayan Award

- Dr. M.P. Rajora
- Development of *Cenchrus ciliaris* varieties CAZRI Anjan 358 and CAZRI Anjan 278
- 2024


भारतीय कृषि अनुसंधान परिषद

प्रशस्ति-पत्र

गणेश शंकर विद्यार्थी हिन्दी पत्रिका पुरस्कार

वर्ष 2015-16 के दौरान 'क' और 'ख' क्षेत्र में स्थित संस्थानों में से केन्द्रीय शुष्क क्षेत्र अनुसंधान संस्थान, जोधपुर द्वारा प्रकाशित हिन्दी पत्रिका "मरू कृषि चयनिका" को तृतीय पुरस्कार से सम्मानित किया जाता है।

दिनांक: 16 जुलाई 2017
नई दिल्ली

सचिव (भा.कृ.अनु.प.)

महानिदेशक (भा.कृ.अनु.प.)

गणेश शंकर विद्यार्थी हिन्दी पत्रिका पुरस्कार

- भाकृअनुप–केन्द्रीय शुष्क क्षेत्र अनुसंधान संस्थान, जोधपुर
- हिन्दी पत्रिका "मरू कृषि चयनिका"
- 2017

ICAR Excellence Awards and Other Recognitions



Fellowship

- Dr. O.P. Yadav
- Indian National Science Academy (INSA)
- Strategic research to understand the adaptation mechanism of crops for water-limited environments using conventional and modern tools
- 2020

Fellowship

- Dr. O.P. Yadav
- National Academy of Sciences, India (NASI)
- Plant Breeding/Drought Tolerance/ Natural Resource Management
- 2023

ISCA Award

- Dr. O.P. Yadav
- Indian Science Congress
- Platinum Jubilee Award in Agricultural Sciences
- 2017



Fellowship

- Dr. C.B. Pandey
- National Academy of Agricultural Sciences
- Natural Resource Management
- 2017



Fellowship

- Dr. Dilip Jain
- National Academy of Agricultural Sciences
- Agricultural Engineering and Technology
- 2021



Excellent work in administrative category with 'ICAR Cash Award'

- Mr. G.P. Sharma
- Outstanding Performance and significant contribution in the organization under Administration and Finance
- 2018



Rajbhasha Gaurav Award

- Dr. A.K. Shukla, Dr. Akath Singh, Dr. Dipak Kumar Gupta
- "फल विज्ञान एवं प्रबंधन"
- 2020

Top 2% scientists in the world by the Stanford University, United States



P. Santra



Dilip Jain



S.K. Singh



Deepesh Machiwal



O.P. Yadav

Sports Champions in Northern Zone of ICAR











9 Gold medals, 6 Silver medals, 5 Bronze medals

A City Road is Named 'CAZRI Road'



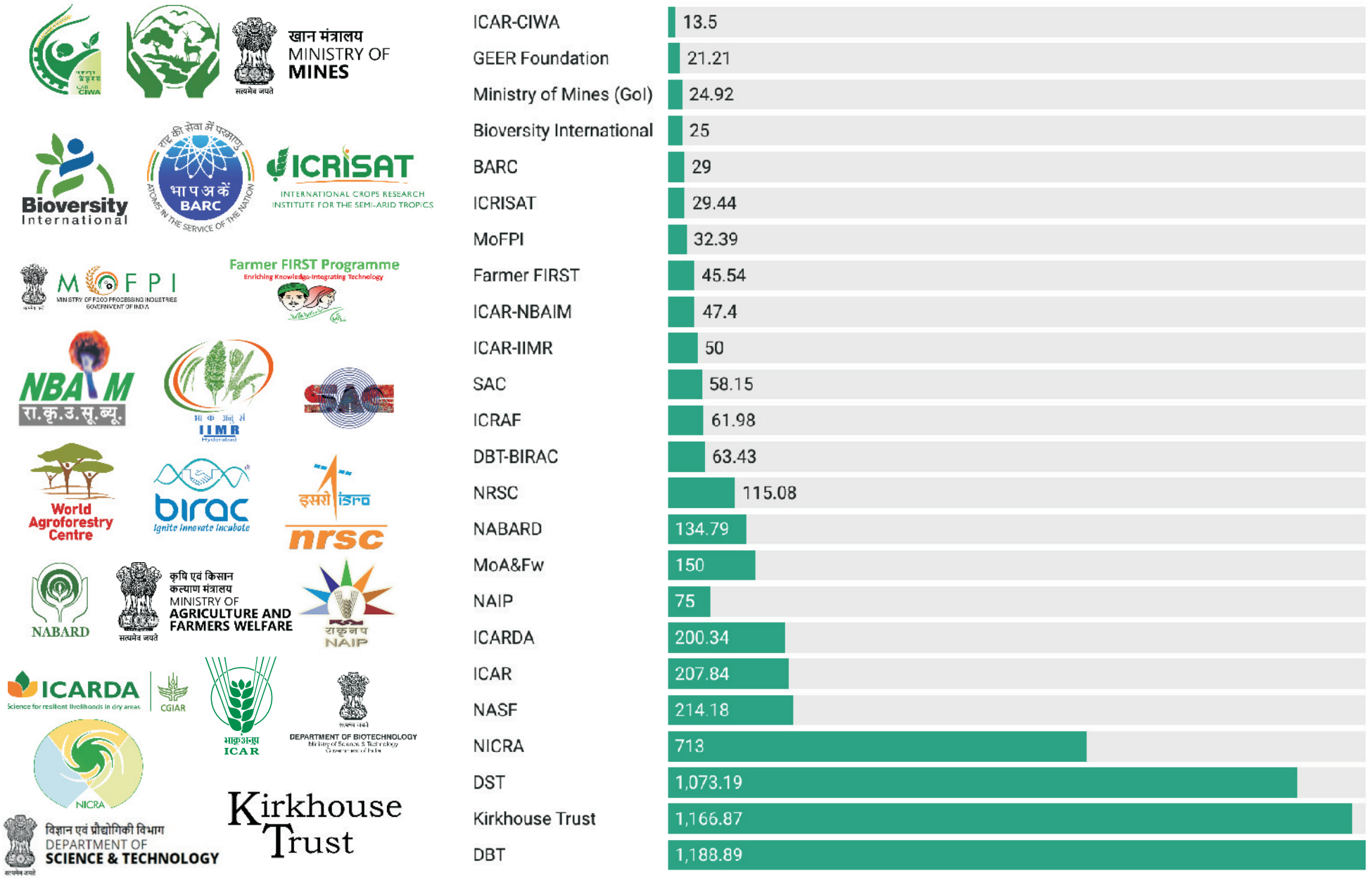






External Funding

* Rs in Lakhs



Human Resource Development

	Scientists	Technical staff	Administrative & Finance personnel	Skilled supporting staff (SSS)	Total
2016	15	28	8	24	75
2017	14	13	5	0	32
2018	12	20	4	25	61
2019	18	39	5	25	87
2020	32	4	0	0	36
2021	45	114	31	70	260
2022	19	9	0	0	28
2023	24	6	1	0	31

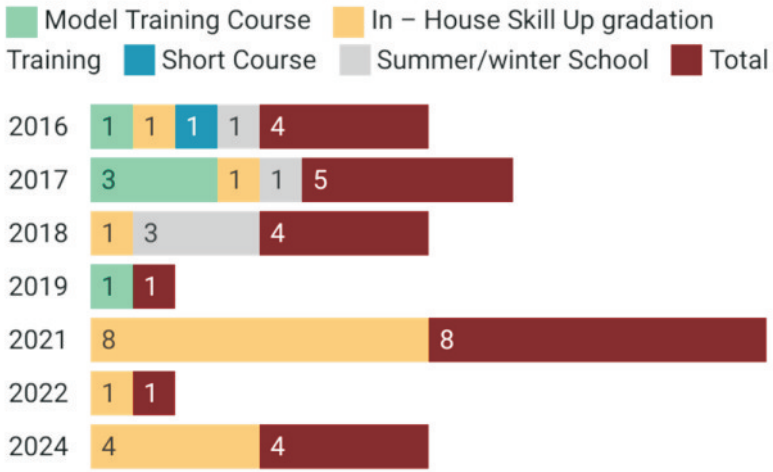
Number of employees trained







Post Graduate and Doctoral Students of IARI Mega University, Jodhpur Hub (ICAR-CAZRI)



Training courses organized

Showcasing the Institute



Visit of Hon'ble Vice-President, Sh. M. Venkaiah Naidu







- Hon'ble Vice-President visited on 29 September, 2021
- He was accompanied by Sh. Kalraj Mishra, Hon'ble Governor of Rajasthan
- Hon'ble Vice President applauded the working models of smart agriculture, cheaper polyhouses and agri-voltaic system developed by the institute

Visit of Hon'ble Vice-President, Sh. Jagdeep Dhankhar







- Hon'ble Vice-President visited on 7 October, 2023
- He interacted with farmers and scientists
- He was accompanied by Union Jal Shakti Minister, Sh. Gajendra Singh Shekhawat and Union Minister of State for Agriculture and Farmers' Welfare Sh. Kailash Choudhary

Visit of Union Minister of Agriculture and Farmers' Welfare, Sh. Narendra Singh Tomar









Visit of Union Minister of Agriculture and Farmers' Welfare, Sh. Shiv Raj Singh Chauhan









Visit of Union Minister of State for Agriculture and Farmers' Welfare, Sh. Gajendra Singh Shekhawat









Visit of Union Minister of State for Agriculture and Farmers' Welfare, Sh. Kailash Choudhary







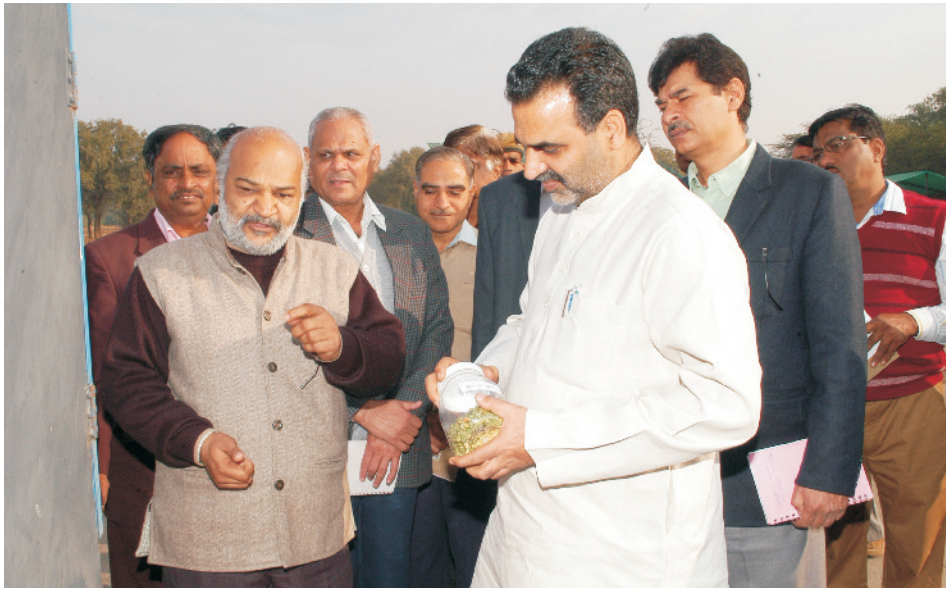


Visit of Union Minister of State for Agriculture and Farmers' Welfare, Dr. Sanjeev Balyan









Visit of Ministers of Central and State Government



Sh. Giriraj Singh, Union Minister of Rural Development



Sh. Prahlad Singh Patel, Union Minister of State for MoFPI



Dr. Harsh Vardhan, Union Minister of Science and Technology



Sh. Jaswant Yadav, Minister of Labour and Employment, Govt. of Rajasthan

Congregation of Senior Research Managers and Policy Makers



- Director General of ICAR
- Members of Governing Board of ICAR
- Vice-Chancellors of SAUs
- DDGs and ADGs of ICAR
- Directors of ICAR Institutes





Dr. T. Mohapatra, Director General, ICAR and Secretary, DARE, GoI







Dr. H. Pathak, Director General, ICAR and Secretary, DARE, GoI









Dr. R.S. Paroda, Former Director General, ICAR at CAZRI









Dr. S.K. Chaudhari, Deputy Director General (NRM)



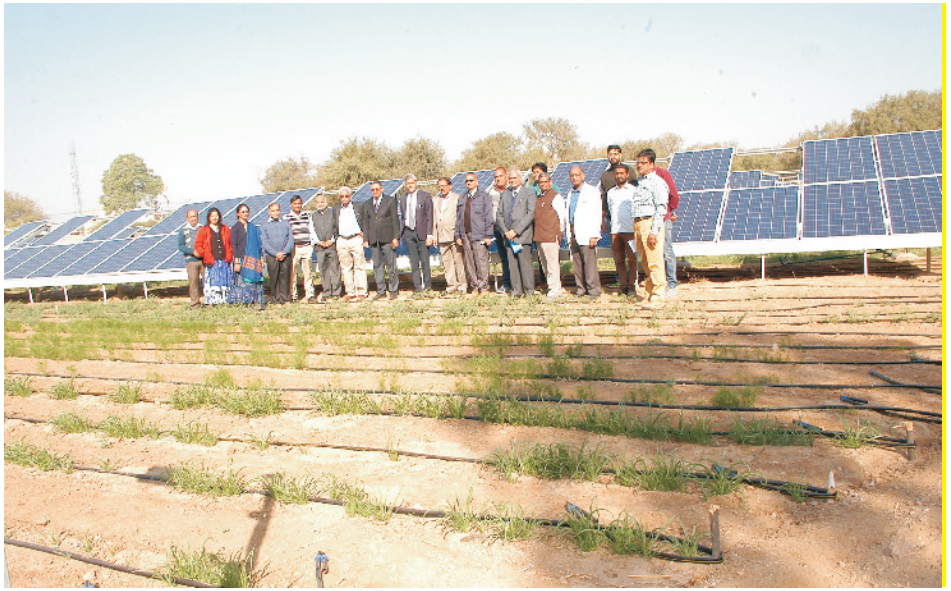






Dr. A.K. Sikka, Deputy Director General (NRM)









Dr. K. Alagusundaram, Deputy Director General (Agricultural Engineering)









QRT Reviewing Work (2010-2016) of the Institute





Dr. B. Venkateswarlu, Dr. K.S. Ramchandra, Dr. Suresh Pal, Dr. S.K. Gupta, Dr. G.R. Korwar and Dr. Bijay Singh





QRT Reviewing Work (2017-2023) of the Institute





Dr. Gurbachan Singh, Dr. Y.S. Ramakrishna, Dr. P.C. Sharma, Dr. B. Sridhar, Dr. Putan Singh and Dr. Jigmet Yangchan





RAC Assessing the Work (2016-2019) of the Institute





Dr. J.S. Samra, Dr. D.K. Benbi, Dr. S. Kumar, Dr. H.S. Balyan, Dr J.K. Singh, Dr. Arun Varma, Dr. I.J. Mathur and Dr. S. Bhaskar





RAC Assessing the Work (2020-2022) of the Institute





Dr. B. Venkateswarlu, Dr. B.S. Dwivedi, Dr. A.R. Sharma, Dr. B.B. Singh, Dr. A.K. Vasisht, Dr. B.S. Prakash and Dr. S. Bhaskar





RAC Assessing the Work (2023-2026) of the Institute





Dr. K.D. Kokate, Dr. Rajbir Singh, Dr J.C. Dagar, Dr. A.K. Patra, Dr. S.M.K. Naqvi and Dr. Atmaram Mishra





Senior Research Managers during Visit to the Institute


Dr. S. Bhaskar


Dr. Rajbir Singh


Dr. D.K. Yadava


Dr. S.N. Jha


Dr. J.S. Sandhu


Sh. Rajender Singh


Dr. Manjit Singh


Dr. V.K. Singh


Dr. J.P. Mishra

Senior Research Managers during Visit to the Institute



Dr. S.K. Chaudhari with team



Drs. P.C. Sharma, S.P. Kimothi, A.K. Singh and T.K. Bhati



Dr. A.K. Mishra



Drs. K. Sami Reddy, Rajbir Singh, R.K. Yadav,
N.G. Patil, Sunil Kumar

Galaxy of Senior Research Managers at CAZRI



Dr. A.S. Faroda



Dr. Gurbachan Singh



Dr. C.D. Mayee

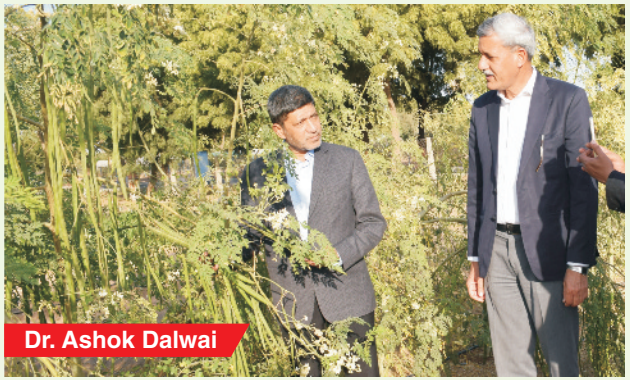


Dr. Sanjay Kumar

Senior Research Managers during Visit to the Institute


Dr. H.S. Gupta


Drs. T.R. Sharma and G.P. Singh


Dr. Ashok Dalwai


Dr. S.K. Datta


Dr. B.S. Dhillon


Dr. A.K. Singh


Dr. S.S. Chahal


Dr. B.S. Dwivedi


Dr. K.S. Khokhar

Dr. Rattan Lal, Director, CFAES, Ohio State University at CAZRI









Galaxy of Global Leaders at the 13th International Conference on Development of Drylands, Jodhpur



Dr. Aly Abousabaa, Director General, ICARDA; Dr. Claudia Sadoff, Director General, IWMI; Dr. R.S. Paroda, Former Director General, ICAR; Dr. A. El-Beltagy, Former Director General, ICARDA; Dr. Panjab Singh, Former Director General, ICAR; Dr. Martin Kropff, Director General, CIMMYT; Dr. Peter Carberry, Director General, ICRISAT with Sh. Gajendra Singh Shekhawat, Union Minister of State for Agriculture and Farmers' Welfare, GoI and others

Galaxy of Global Leaders at CAZRI



Dr. Peter Carberry, Director General, ICRISAT



Dr. Aly Abousabaa, Director General, ICARDA



Dr. Martin Kropff, Director General, CIMMYT



Dr. Claudia Sadoff, Director General, IWMI

Galaxy of Global Leaders at CAZRI



Dr. R.S. Paroda, Dr. A. El-Beltagy and Dr. Ismail Serageldin



Dr. Panjab Singh, Dr. B. Ventakeswarlu, Dr. Claudia Sadoff
Dr. Rajeev Varshney, Dr. A.K. Sikka, Dr. A.K. Singh and others



Dr. Panjab Singh, Dr. Rajeev Varshney, Dr. B. Ventakeswarlu



Dr. A. El-Beltagy, Former Director General, ICARDA

Directors' Gallery



Directors' Gallery: Remembering the Legacy



Museum and Galleries: A Quick and Real-time Introduction to the Institute









Science Walks: Connecting Everyone









The Journey Continues...





CAZRI®

Enhancing resilience of arid lands