



CIAH: NEWSLETTER

ICAR-Central Institute for Arid Horticulture
Beechwal, Bikaner-334 006, Rajasthan



Vol. 21, No.01

January - June, 2021

From the Director's Desk



I am feeling immense pleasure by bringing out this six monthly Newsletter of the ICAR-Central Institute for Arid Horticulture, Bikaner (Rajasthan). Ever since its inception, ICAR-CIAH is dedicated in conducting strategic research and developmental programmes to boost up the horticultural production in hot arid and semi-arid regions of the country. The Institute is actively engaged in research activities such as development of improved varieties and production technologies of arid horticultural crops which are able to give high yield with quality production under prevailing abiotic and biotic stresses in hot arid and semi-arid climatic conditions. The long term goal of the Institute is to turn the barren and unproductive lands of the hot arid and semi-arid regions of the country into productive green with rewarding horticultural belts so as to reinforce the socio-economic status of rural inhabitants of the regions. Thus, the Institute is dedicated to serve the farmers and stakeholders of arid and semi-arid regions by developing location specific arid horticultural technologies, introduction of new genotypes/crops from iso-climatic conditions, feasible package and practices which can lead to successful production of horticultural crops under adverse climatic condition of arid and semi arid regions of the country.

During the reported period of time, various experiments were conducted and various new techniques/technologies were developed/envisaged like dehydration technique of kundru fruits, identification of physico-chemical properties of tumba

(*Citrullus colocynthis* L.), DNA fingerprinting of watermelon cultivars, identification of soft date genotype *Dhamas* of date palm and vegetable cowpea lines for hot arid climate, effect of

Size of polybag on growth characteristics and survival of thornless *ker* 'AHCD-1' (IC-0634593), new introduction *Daisy* mandarin in *Thar* desert, effect of packaging material on post-harvest life of mulberry fruits, effect of saline water on production of Snapmelon (*Cucumis melo momordica*), collection of a new Indigenous germplasm of mushroom, profitability evaluation of vegetable cultivation in hot arid climatic conditions under low tunnel technology, etc.

Under the of HRD programmes, a National Webinar on "Indian JuJube" and 'Low Tunnel Vegetable Production' as a part of "Azadi Ka Amrit Mahotsav" were organized to exchange the generated information of R&D among researchers/ students/ farmers/ stakeholders .

Various farmers' programmes and activities like trainings, farmers' advisories, FLDs, method demonstrations and interactions, research-extension-farmers-interaction meetings, visit to farmers' fields, activities for women empowerment, celebration of seed sale/distribution day/days, weeks, distribution of inputs, technical literatures, etc., works were carried out during the period. Some technological exhibitions of the Institute were displayed out of the Institute in different Kisan Mela/programmes, among them some were honored with Best Technological Exhibition Awards. Several programmes/activities were also organized under Mera Gaon Mera Gaurav (MGMG) Scheme in adopted villages of the Institute during the reported period of time. In addition to above, various technological advisory work (One line / telephonic/off line discussions/ guidance/Question.-Answer) with farmers were also performed. Moreover, several programmes/ activities like training; technological interaction and input distribution among SC farmers/ farm women were also organized under ongoing SCSP Scheme in the Institute.

The major programmes/activities and achievements of the Institute including its regional station and KVK during last six months are being highlighted through this Newsletter in brief.

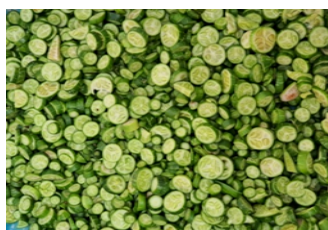
(B.D. Sharma)
Director

Research Spectrum

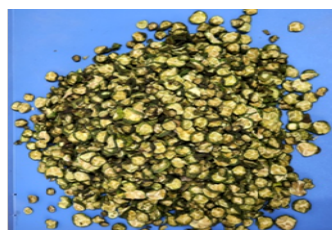
At H. Q. , Bikaner.

Standardization of dehydration technique of kundru fruits for entrepreneurship:

Ivy gourd (Kundru or Tindori) is native cucurbit and the variety Thar Sundari recommended by ICAR-CIAH, Bikaner is most prospective because of gynoeious, parthnocarpic fruit development and prolific bearing from March to November month, and thus exhibited scope for fruits dehydration for vegetable cooking. To standardize procedures and practices of kundru dehydration, marketable quality fruits of 6 to 9 days of growth from opening of female flowers were found best, and were 12-16 g weight, 6-7 cm length and 1.5-2.0 cm diameter.



Kundru fruits for drying



Dried flakes of kundru

For dehydration, fruits slices were prepared in two ways i.e. longitudinal 4 & 8 slices/fruit and circular rings of 0.4-0.5 cm thickness and sun-drying was done under partial shade. The high temperature and low humidity conditions helps in quick drying and 8-9 per cent dried flakes of fresh weight were obtained. One person can harvest 20-25 kg fruits and can process into final product of about 2.0 kg dried-flakes. The market value of dried product is 350-400 Rs/kg. Dried-flakes can be stored well in food grade plastic boxes or polypropylene bags for 9-12 months. For small family, 40-50 g dried flakes is enough after re-hydration for cooked vegetable. A package of practices for production and processing of kundru is standardized and available for transfer to stakeholders for rural entrepreneurship (D.K. Samadia, P.S. Gurjar, A.K. Verma and Hanuman Ram).

Momordica balsamina L. (Jhaar karela): Nature's silent healer:

Momordica balsamina L. is a local type of bitter gourd commonly known as *Jhaar karela*. The combination of its biochemical composition, nutritional value and medicinal value makes it the real nature's wonder.



Tender fruits of *M. balsamina*



Bearing vines of *M. balsamina*

Keeping in view the medicinal potential of *M. balsamina*, collected six germplasm from different places of Rajasthan. The evaluation of collected material was done during rainy season of 2020 at ICAR-CIAH, Bikaner. The evaluated material showed variability with respect to fruit weight (5-8 g), fruit diameter (1.5-2.3 cm), fruit length (2-2.70 cm) and fruit yield/ plant (0.7-1.0 kg). It is monoecious in nature and propagated through seeds. The non-targeted phytochemical profiling of marketable

sized fruits was also carried out. The results revealed presence of fatty acids, phenolics, terpenoids, flavanoids, alkaloids, tannins, esters and amino acid derivatives, which comprises of 100 compounds. In the detected compounds major part was fatty acid (about 60%), which comprises of MUFA's and PUFA's along with some unusual fatty acid with odd number carbon compounds. Most of the detected compounds have been proved to have important bio-activities like anti-microbial, anti-inflammatory, anti-cancer, analgesic, anti-pyretic, anti-diabetic, hepatoprotective, cardiovascular, antioxidant, anti-mutagenic, etc. Some important phytochemicals like 3',5'-Dimethoxyacetophenone, Ar-tumerone, Ascorbic acid, Heptadecanoic acid, Cyclopropanedecanoic acid 2-hexyl, Cyclononasiloxane, octadecamethyl-, 4,7,10-Hexadecatrienoic acid, 8,11,14-Eicosatrienoic acid, (Z,Z,Z)-, 2-(Dimethylamino) ethyl adamantanecarboxylate, Dotriacontane, 2,6,10,14,18,22-Tetracosahexaene, 6,9,12,15-Docosatetraenoic acid, Bisabolen-12-OL, etc. were detected in *M. balsamina* fruits which proved the pharmaceutical applications against major diseases like cancer, diabetics, cardiovascular and some other chronic diseases (B.R. Choudhary, M.K. Berwal and P.L. Saroj).

Occurrence of disease incidence of Cercospora spot in pomegranate:

Pomegranate varieties/genotypes were infected from *Cercospora* spot caused by *Cercospora punicae* at Pomegranate Germplasm Block of the Institute under hot arid climatic conditions. This disease was appeared on leaves and fruits under field conditions. Symptoms appeared as circular, reddish brown to dark brown spots with blackish brown margin on leaves. Many spots coalesce to form bigger sized lesions. Numerous,



Cercospora fruit spot



Cercospora colony

minute, circular, brown spots that turned brown to black spots on fruits. Disease incidence (PDI) was found from 1.24 to 50.35% in different pomegranate varieties/genotypes. Minimum disease incidence (1.24-2.56% per cent disease index) was recorded in pomegranate variety 'Gul-E-Shah Red' while maximum disease incidence (35.56-50.35% PDI) was noted in germplasm Tujetis EC-104347 (S. K. Maheshwari, Ramyashree Devi, Ramkesh Meena and Ramesh Kumar).

Physico-chemical Properties and Fatty Acid Profile of Tumba (Citrullus colocynthis L.) Seed oil.

Tumba (*Citrullus colocynthis*) is a prostate annual herb belongs to cucurbitaceae family and is highly tolerant against multiple abiotic stresses. The tumba fruits were harvested from ICAR-CIAH research farm. The seeds were separated from the fruits and extracted the oil with soxhlet apparatus using petroleum ether as solvent. The tumba fruits contain 2-3% brown colored seeds which contains 23-25% golden-yellow colored oil with 0.93 g/ml specific gravity. The extracted oil was assayed for physico-chemical properties and fatty acid profile.



The results of GC-MS/MS based fatty acid profile demonstrated that *tumba* seed oil contains about 70% unsaturated fatty acids with more than 51% PUFAs. It mainly contains Linoleic acid C18:2n6 (50.30%), followed by Oleic acid C18:1n9 (18.02%), Stearic acid C18:0 (15.15%) and Palmitic acid C16:0 (12.41%). It is demonstrated as an excellent source of essential fatty acids like omega-6 (e.g., Linoleic acid) whereas omega-3 (α -Linolenic acid) and hydroxy polyunsaturated fatty acids are found at lower level. It also contains some odd chain fatty acids (OCFAs) like pentadecanoic acid (C15:0) and heptadecanoic acid (C17:0) which has been demonstrated as an essential fatty acid recently with their bioactivities as lower risks of cardiometabolic diseases, and higher dietary intake of these OCFAs is associated with lower mortality. In conclusion tumba seed oils can be an excellent dietary source of essential fatty acids with a number of medicinal properties (M. K Berwal, Chet Ram, P.S. Gurjar and B.R. Choudhary).

DNA fingerprinting of watermelon cultivars using functional molecular markers: For DNA fingerprinting of watermelon cultivars, sixteen ScoT and 25 CBDP markers were used for profiling on genomic DNA of watermelon cultivars. Leaf samples were collected at seedling stage and DNA was isolated from the pooled sample. Consequently, eleven ScoT and 16 CBDP markers produced varietal specific bands and differentiated each cultivar (Chet Ram, Dhurendra Singh and B. R. Choudhary).

Identification of soft date genotype Dhamas of date palm: Date palm (*Phoenix dactylifera L*) fruits are commonly consumed as a doka, soft and dry dates in Arabian countries. Indian condition, the time of fruit maturity coincides with rain and unable to get soft dates (pind) fruits. This genotype has



been identified promising which was early maturing in the month of June with 90 percent soft fruits before onset of monsoon. The average yield of plant was 40-50 kg, fruit weight 11.5g, fruit size 45.7mm x 20.5mm, number of bunches per plant 10.3, stalk length 56.1 cm, bunch length 16.67 cm, number of strands 51.7, pulp stone ratio (5.6) and TSS 50.2⁰ Brix were recorded. This genotype is early maturing group (last week of June) & highly suitable for soft date (Pind Khajoor) making (R. K. Meena & P.L. Saroj).

Spider mite (*Oligonychus afrasiaticus*): A serious pest of date palm. The mite infection was observed during growth and development as well as ripening stages of date palm fruits. Its adults and nymphs suck the sap of immature green date fruit causing severe fruit scarring, distorting, turn date to

brown with scabbed appearance. This pest is sucking fruit juice, crease spotting leading to stop fruit growth and destroying



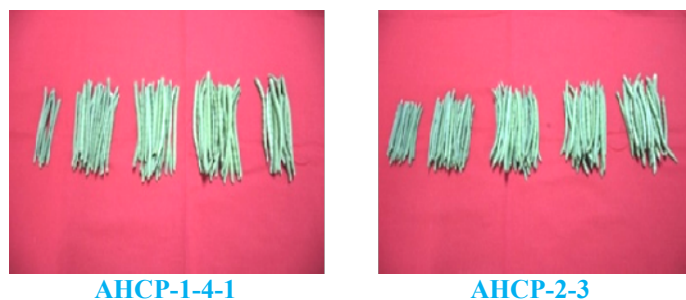
Dust mite infection on date fruits

natural appearance & causes their size to shrink and reduce market value of fruits. The serious infection of dust mites build up the webs on fruits bunches around strands and date fruits. The insect's population are blocking the physiological activities of the fruits owing to delays in natural fruit coloring and ripening. The web of mite adheres to dust and sand particle accumulate on infested bunch and turn fruits to dusty appearance that's why the mites are known as dust mite. Eventually, the fruits become unfit for human consumption.

(R.K. Meena, P.L. Saroj, P.S. Gurjar & Pawan Pareek)

Identification of vegetable cowpea lines for hot arid climate:

In traditional mixed cropping of arid region, cowpea (*Vigna unguiculata*) is grown for grain production but its pre-mature pod and seed is also used for vegetable culinary. The indigenous germplasm of vegetable and multi-purpose pod quality types were collected, maintained and used as regional diversity for developing drought and abiotic stress tolerant varieties. As a result two breeding lines viz. AHCP-1-4-1 and AHCP-2-3 were stabilized and found potential for commercial cultivation.



The line AHCP-1-4-1 is vegetable pod quality variety and suitable as irrigated crop. It is early maturing and took 46.5-58.2 days for first harvesting of tender pods. The tender pods at marketable stage are green to dark-green in colour, 12.25-13.52 cm length, 0.50-0.64 cm diameter and 1.95-2.47 g weight. It has the yield potential of 132-174 q/ha. The line AHCP-2-3 is multiple use and tender pods as vegetable quality variety and suitable as rainfed crop. It is very early maturing and took 40.5-48.7 days for first harvesting of tender pods. The tender pods at marketable stage are green to dark-green in colour, 10.86-11.87 cm length, 0.47-0.58 cm diameter and 1.62-2.35 g weight. It has the yield potential of 124-168 q/ha under rainfed conditions. On the basis of performance over the years (2017-2020), both the varieties exhibited superiority for plant growth, pod quality and yield attributes and are under multi-location trial under AICRP on vegetable crops (A.K. Verma, D.K. Samadia, Hanuman Ram and S M Haldhar).

Effect of sizes of polybags on plant growth characteristics and survival of thornless ker 'AHCD-1' (IC-0634593) seedlings: A study was performed on *ker* seedlings to observe the effect of size of polybags on root formation, growth and

development of saplings. There were two sizes of polybags *i.e.* small (15 x 7 cm) and big (30 x 17 cm) used for the purpose. Seventy five days old seedling plants of *ker* were shifted into both sizes of polybags pre-filled with soil, clay and vermicompost (2:1:1).

In small size polybags, average plant height and root length were measured 23.6 cm and 9.2 cm, respectively. Number of branches per plant and plant survival percentage were recorded 6.8 and 66.67%, respectively.



In big polybags, average plant height and root length were measured 34.5 cm and 9.8 cm, respectively. Number of branches and plant survival percentage were recorded 14 and 76.66%, respectively. Therefore, it is concluded and recommended that big size polybags (Figure 1) should be used for multiplication of *ker* plants for better growth and maximum survival of plants (Kamlesh Kumar, D.K. Samadia, Chet Ram, D. Singh and P.L. Saroj).

Daisy mandarin: A new introduction in Thar Desert: Citrus (*Citrus spp.*) is an emerging fruit crop under canal irrigation of hot arid regions of Rajasthan. Among different species of citrus, mandarin, sweet oranges, lime and lemon are most popular and widely cultivated. A new citrus interspecific hybrid namely Daisy mandarin (Fortune x Fremont) was introduced at ICAR-CIAH, Bikaner during July, 2016 from Excellence Centre for Fruits, Sirsa. After field planting and evaluation, The fruit



Daisy Mandarin

quality attributes have registered TSS 13.95°Brix, acidity 0.58 %, rind thickness 2.20 mm, juice 52.54%, fruit weight 180.24 g and yield 25.50 kg/plant on 4th year. It was found promising for early fruit maturity during November- December with excellent fruit quality production. So, it can help in fetching high remunerative prices due to early harvesting. It has very attractive rind colour, high TSS, maturity index and better keeping quality with low acidity and thinner rind as compared to kinnow under hot arid climate (J.S. Gora, R. Kumar, R.C. Balai and B.D. Sharma).

Packaging material influence post-harvest life of mulberry fruits:

Mulberry fruits are rich in nutrition, but perishable in nature and prone to damage during post-harvest handling due to climacteric ripening behavior. Therefore, an experiment was conducted for evaluation of shelf life in different packaging material at ambient conditions (Temperature: 40±2 °C and RH).



The packaging treatments were CFB box with 0.3% ventilation (T₁), CFB box with 0.5% ventilation (T₂), CFB box covered with cling film (T₃), muslin cloth bag (T₄), brown paper

bag (T₅) and open plate as control (T₆). Results revealed that slow progression in TSS and anthocyanin content were noticed in T₃ and T₁ throughout the storage period.

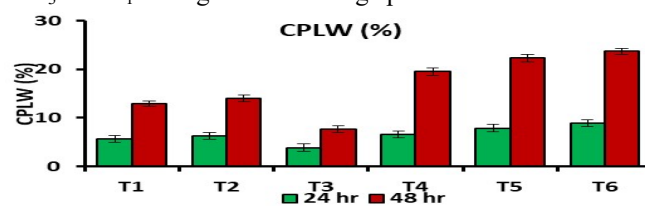


Fig.: CPLW of mulberry fruits in different packaging material at ambient conditions

Moreover, minimum cumulative physiological loss in weight (7.63%) after 2 days (48 hrs) was observed in T₃ followed by T₁ (12.87%) and maximum in control (23.72%). Thus, CFB box covered with cling film (T₃) and CFB box with 0.3% ventilation (T₁) enhanced shelf life for 2 days and found suitable packaging for mulberry fruits (P.S. Gurjar, D.K. Sarolia, R. K. Meena, D. Singh and Anita Meena).

Production technology of Snapmelon (*Cucumis melo momordica*) with saline water irrigation under arid ecosystem:

The work was carried out to investigate the effect of water with (4EC_{dSm⁻¹}) and without saline (.5EC_{dSm⁻¹}) on snapmelon. Maximum percent yield response was observed, where the treatment of IW@ 4EC_(dSm⁻¹) + FYM @15 ton/ha was applied (35.27%) followed by IW @4EC_(dSm⁻¹) + vermicompost @10ton/ha (24.46%) and IW@4EC_(dSm⁻¹) + Gypsum@4ton/ha. The treatment of VC@10 ton /ha with both salinity level .5EC and 4EC level were recorded maximum leaf area (59.10 cm and 58.92 cm), leaf area index (0.59 and 0.59) while maximum TSS (5.17 and 5.35) were recorded in treatment of FYM @ 15 ton/ha with .5EC and 4EC salinity level respectively. Gypsum @5ton/ha+IW@4EC_(dSm⁻¹) is registered for the highest dry matter percentage, maximum fruit weight (349.58gm), fruit length (13.7 cm), fruit diameter (21.56 cm) under 4EC irrigation water. From the result, it can be concluded that the saline water can be a alternate source of irrigation water under arid region (Anita Meena, R.C. Balai and M.K. Jatav).

Collection of germplasm of Indigenous mushroom of western Rajasthan:

Survey was done during September, 2020 in Badrasar, Bharukhera and Jaliwali, villages of Bikaner district for collection of Indigenous mushroom and further studies on collected samples were conducted in 2021. Locals of Bikaner district are well aware about the edible mushroom identification and curry prepared out of indigenous mushroom is well cherished by them. There by the mushroom is sold at high price of Rs 300-400 per Kg during months of July-September. Locals believe mushroom appear on occurrence of rain with thunder and lightning.



Wild edible mushrooms



Colony of mushroom



Five mushroom specimens were collected near different root zone of dessert weeds like *Calligonum polygonoides* etc. All the mushroom specimens were isolated on PDA medium. The tissue from the junction of pilus and stipe was used for the culturing. Mushroom colony start appearing after 48 hr OF inoculation at 35⁰ C. The culture isolated will be further used for studies on physiological requirement and genetic studies in coming years (**Ramyashree Devi G. S., S.R. Meena and Anita Meena**)

Profitability of vegetable cultivation under low tunnel Technology: A three day survey was conducted in different villages of Bikaner district where farmers were using low tunnels for vegetable cultivation. Approximately 40-50 farmers were interviewed and primary data was collected by using survey schedule. It was found that all the farmers were growing mainly cucurbits under low tunnels with bottle gourd, sponge gourd, water melon, musk melon and long melon as the major



crops. The CACP cost concepts and B-C ratio was used to examine the economic feasibility of the technology. The study reveals that the B-C ratio varies between 2.2 to 2.6 for all the crops which indicate that the vegetable cultivation under low tunnel was profitable. The low tunnel technology significantly contributes in doubling farmers' income as it enables the farmers to have off season vegetable cultivation which fetches relatively higher prices in the market along with the regular season's arrival (**Rekha Rani, S. R. Meena, B. R. Choudhary and M. K. Jatav**).

Farmers' programmes/extension activities.

(a) At H.Q. Bikaner

❖ Trainings.

- During the reported period of time 16 training programmes including trainings under SCSP Scheme were conducted on different topics/aspects related to improved arid horticultural production technologies (**S.R. Meena, R.C. Balai, Rekha Rani, and SCSP Committee**).



❖ Front Line Demonstration (FLDs)

- Conducted FLD on improved variety of Kachri (AHK-119) in Birtdhwal villages (Suratgarh) of Shri Ganganagar district (Raj.) at field of Ramswaroop Meghwal on 20.02.2021.
- Conducted FLD on improved variety of Kachri (AHK-119), Snapmelon (AHS-82), Long melon (Thar Sheetal), ridge gourd (Thar Karni) and clusterbean (Thar Bhadvi) in Gigasar villages of Bikaner district (Raj.) at field of Sh. Kalu Ram Jat on 23.02.2021.
- Conducted FLD on improved variety of Snapmelon (AHS-82), in Napasar villages of Bikaner district (Raj.) at field of Sh. Bhanwar Lal Meghwal on 25.02.2021.
- Conducted FLDs of improved variety of kachri (AHK-119) and snapmelon (AHS-82), ridge gourd (Thar Karni), long melon (Thar Sheetal) at the field of Sh. Bhanwar Lal (Pappu) Meghwal (Kadela) of Ambasar village of Bikaner district on 09.03.2021.
- In addition to FLDs, > 30 method demonstration of the production technologies of arid horticulture were also performed at the Institute to the visiting farmers or while visiting to the farmers' fields during the reported period of time.

❖ Organization of Exhibitions.

- Participated and arranged an exhibition stall of improved arid horticultural technologies during the Kisan Mela organized by KVK Gudamanali, Barmer-II under AU, Jodhpur on 06.03.2021 and we got **Best Technological Exhibition Award** in this Mela. This award was given by Hon'ble State Agriculture and Farmers' Welfare Minister, Sh. Kailash Chaudhary Ji.



❖ Other extension activities.

- More than 20 technical lectures (online /offline) were delivered during the different farmers' trainings and other programmes organized at the Institute or outside of the Institute during the reported period of time.
- Delivered more than 30 lectures related arid horticultural technologies to visiting farmers, students, stakeholders at the Institute or while visiting to the farmers fields during the reported period of time.
- Various "Farmers' Advisory" were prepared sent to farmers, Arid-Hort.-Farmers' users, clients using different online/offline means and methods.
- More than 300 farmers, students, field workers, supervisors, SMS, dignitaries/ NGO, etc. were visited to Institute during the reported of time.

- More than 20 on/off campus Research- Extension - Farmers-Interface- Meetings to inculcate the knowledge and awareness among the farmers about improved production technologies of arid horticultural crops. The activities like visit, meetings/group discussion training, interaction, etc., were also organized for empowerment of farm women, particularly in the field of arid horticulture.
- Various farmers' programmes and activities like visit, meetings/group discussion training, interaction, Research-Extension - Farmers- Interface- Meetings (REFIM), diagnostic and problem solving visits, etc., were conducted in adopted villages under MGMG Scheme of the ICAR/Institute.
- More than 1000 technical folders/literature were distributed among the farmers/ clients during different extension programmes/ activities/ occasions.
- There were made 10 diagnostic and advisory visits to farmer's fields to solve their problems and provide technical help/suggestions for their better crop production/farming system.
- Various programmes/activities like farmers' visits, meeting/*Sangosthi*, discussions, training, kisan Diwas, FLDs, method demonstrations, mobile advisory, creating linkages, creating knowledge and awareness, distribution of seeds and planting materials, technical literature, etc., were organized under Mera Gaon Mera Gaurav (MGMG) Scheme in adopted villages of the Institute during the reported period of time. In addition to above, various technological advisory work (online / telephonic/off line discussions/ guidance/questions.-answers) with farmers were also performed (S. R. Meena, R. C. Balai, Rekha Rani and other scientists of the Institute).

(b) At Regional Station (CHES), Godhara (Gujarat).

During the reported period of time, Regional Station (CHES), Godhara (Gujarat) conducted different farmers' training programme on various aspects related to dry land horticulture technologies for enhancing farmers' income.

HRD Programmes/activities.

- Organized the National Webinar on "Indian JuJube" held in the Institute on 14.06.2021.
- Organized the webinar on "Importance of YOGA and its advantages" at the Institute on 21.06.2021 on the occasion of International Yoga Diwas on 21.06.2021.
- **National Webinar on 'Low Tunnel Vegetable Production'**: As a part of "Azadi Ka Amrit Mahotsav", ICAR-CIAH, Bikaner organized a National Webinar on 'Low Tunnel Vegetable Production' virtually on 25th June, 2021 to exchange the generated information of R&D among researchers/ students/ farmers/ stakeholders (B.R. Choudhary, Hanuman Ram, Dhurendra Singh and P.L. Saroj)



❖ Programmes under SCSP Scheme:

- **Organization of training and input/items distribution programme under SCSP Scheme:** Organized 11 training



programmes and distributed different inputs like, vermicompost, fertilizers, vegetable seed kit, seeds of groundnut and clusterbean, sewing machines, kitchen utensils, agricultural tool kit (Sacetear, saw, *khurpi*, budding knife, *daranti*), plastic tub, spinosad insecticide, technical folders, etc. among SC farmers in different district of Rajasthan during the reported period of time (Director & SCSP Committee).

- **Organization of training and agril. input/items distribution programme under SCSP Scheme:** Seven days training programme on "Nutri-garden for nutritional and income security in the arid region" exclusively for women farmers was organized from 05.03.2021 to 11.03.2021 at ICAR-CIAH, Bikaner. Total of 40 SC women of Pemasar, Udasar, Sagar and Husangar villages of Bikaner district participated in the training programme. At the end of training programme sewing machines were distributed to all SC women participants. (Anita Meena, R. C. Balai, M. K. Jatav, R.K. Meena, P. S. Gurjar, K. L. Kumawat, Hanuman Ram).

❖ Organization/Celebration of days/ weeks/ fortnights

- **Celebration of National Science Day:** The institute celebrated National Science Day on 28th Feb.2021.
- **Celebration of World Environment Day:** ICAR-Central Institute for Arid Horticulture enthusiastically celebrated World Environment Day on 5th June 2021. On the occasion plantation work was done in the institute.



- **Celebration of International Women's Day:** The International Women's day was celebrated at institute on 8th March, 2021 with the theme "Choose to challenge: Women leadership in agriculture, entrepreneurship, equality and empowerment.
- **Farmers' awareness campaign on balanced use of fertilizers:** Carried out farmers' awareness campaign on "Balanced use of fertilizers" during which, I played leading role in organizing this campaign in villages like Gigasar village of Bikaner district on 18.06.2021 in which more than 90 farmers/farm women and children participated.

❖ Visit of VIPs/Dignitaries at the Institute

- Smt Santosh Khatod, State Awardee progressive Women Farmer visited in the institute on the occasion of International Women Day on 08.03.2021.
- Shri Jaydeep Shrivastava, CGM-NABARD visited the institute on 13.02.2021
- Sh. Ramesh Tambia Dyputy Director, NABARD – Bikaner visited the institute on 13.02.2021
- Dr. Sumit Godara, MLA Lunkarnsar, Bikaner visited the Institute on 22.06.2021. He visited the whole farm/experimental block of the Institute, interacted with Director, scientists and highly appreciated the work progress and technologies developed by the Institute as a whole.
- Shri Rajendra Joshi, Sr. Journalist visited the institute on 22.03.2021

❖ Awards received

- Institute received Best Technological Exhibition Award during Kisan Mela organized by KVK Gudamanali, Barmer-II under AU, Jodhpur on 06.03.2021. This award was given by Hon'ble State Agriculture and Farmers' Welfare Minister, Sh. Kailash Chaudhary Ji..

- Dr. Hanuman Ram awarded by "Emerging Scientist Award-2020" for the outstanding contribution in the field of Vegetable Science in 4th International conference on "Global Approaches in Natural Resource Management for Climate Smart Agriculture during Pandemic Era of COVID-19" from 26th to 28th Feb 2021 (through virtual mode).

❖ Important Meetings held

- A Meeting was held at the Institute on 13.02.2021 with CGM and other personnel of NABARD to discuss the different schemes of NABARD and role of arid horticultural technologies in strengthening the same.
- Conducted AICRP & AZF meeting (online) at ICAR-CIAH Bikaner from 26.02.2021 to 28.02.2021.
- A Regional Seminar on "Importance of Water in Arid Region" with the Theme "Valuing Water" was organized on the occasion of "World Water Day" at ICAR-CIAH Bikaner on 22.03.2021.

A success story

❖ High commercial potential of improved variety of Khejri "Thar Shobha": A success story.

ICAR- Central Institute for Arid Horticulture, Bikaner (Rajasthan), developed/ released a wonderful new variety of Khejri named as "Thar Shobha" is highly suitable in hot arid and semi-arid climatic conditions of the country. This variety was popularized among the farmers by conducting its FLDs, trainings, meetings/interactions with farmers, their visits to the experimental locks of the Institutes. Observing the high suitability and commercial production potential of improved variety of Khejri "Thar Shobha", farmers started to grow it on large/commercial scale on their fields. Among such farmers, Sh. Megh Singh Prohit S/o Sh. Hanuman Singh (Village- Kisanasar, Tehsil-Nokha, district- Bikaner, Rajasthan) is one of the progressive farmer who established the orchard of above improved variety (Thar Shobha) in July, 2017 on his field (140 plant) covering about 0.5 ha under the technical guidance of scientists of the Institute (ICAR-CIAH, Bikaner).



Sh. Megh Singh Prohit reported that the performance of crop of improved variety "Thar Shobha" was wonderful and highly beneficial. He said that the sangari /pod formation started in all plants after three years of plantation at small scale. At the fourth year (2021) of the plantation , the yield and wearing of sangari/pods in all plants was very good and satisfactory.

During the year 2021, he got a net income of Rs. 62000/- by selling the fresh sangari/pods from 140 plants (0.5 ha) of the "Thar Shobha". In addition to above, he also got a net income of Rs. 16,000/- by selling the dry *loong* (dry leaves) of the same 140 plants (0.5 ha). Thus, he got a net income of Rs. 78,000/- from the four years old orchard of 140 plants (on 0.5 ha land) during the 2021. He was very enthusiastic and excited to increase the plantation of "Thar Shobha" variety of Khejri at broad level for wide commercial production in future.

In addition to above improved variety of Khejri, " Thar Sobha" he has established the orchard of ber (Gola, Thai apple, Thar Sevika, and Thar Bhubhraj) 200 plants (four years old) , lasoda (Thar Bold) 1300 plants (four years old) , Phalsa 200 plants (three years old), lemon 200 plants (three years old), karonda (20 plants), mosambi (70 plants), Sahnjan (40 plants), malberry (Thar lohit and Thar harit), etc.

Published by:

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