Vol. 04 No. 01 ISSN 2582-0915

# अजैविक स्ट्रैस प्रबंधन समाचार

# Abiotic Stress Management News

## January to June 2023


भाकृअनुप- राष्ट्रीय अजैविक स्ट्रैस प्रबंधन संस्थान

बारामती, पुणे, महाराष्ट्र ४१३११५

ICAR- National Institute of Abiotic Stress Management

Baramati, Pune, Maharashtra 413115

ISSN 2582-0915

# अजैविक स्ट्रैस प्रबंधन समाचार
# Abiotic Stress Management News

भाकृअनुप- राष्ट्रीय अजैविक स्ट्रैस प्रबंधन संस्थान
ICAR-National Institute of Abiotic Stress Management
बारामती 413 115, पुणे, महाराष्ट्र, भारत
Baramati 413 115, Pune, Maharashtra, India

Vol. 04 No. 01 | An ISO 9001:2015 Certified Institute | January to June 2023

## In this issue





**Published By**

**Dr K Sammi Reddy**
**Director, ICAR-NIASM**

## *From the Director's Desk.....*

*Greetings from ICAR-NIASM*

It is with great pleasure that I introduce the latest edition of our Institute's Newsletter, showcasing the achievements and ongoing initiatives at ICAR-National Institute of Abiotic Stress Management, Baramati. ICAR-NIASM is continuously working towards bringing resilience and sustainability in agriculture by addressing the abiotic stresses affecting agriculture. Abiotic stressors such as temperature (high or low), water (excess or deficit) and soil (salinity, sodicity, acidity, heavy metal, nutrient deficiency, and toxicity) have been increasingly affecting the agriculture production and productivity. The institute is instrumental in creating a knowledge base of effect of these stressors on plants/animals/fish and developing suitable technologies for climate resilient agriculture.

Multi-disciplinary research is being carried out to manage these stresses through identification of abiotic stress tolerant crop genotypes and its field evaluation specifically for drought, high temperature and salinity stress, developing new evaluation indices and instrumentation, GHG emission studies, utilizing sugarcane tops as a valuable livestock feed resource, quinoa cultivation in shallow basaltic soils, sunburn management through artificial shading and canopy management in dragon fruit, effect of intercrops and cutting height on green fodder yield of Leucaena, Biomass & carbon stock of fruit and agroforestry systems. In addition to these, many new initiatives and events were carried out. Glimpses of all these have been presented in this Newsletter.

As we navigate the challenges and opportunities in agriculture, the research and initiatives presented in this newsletter illustrate our institute's commitment to excellence. I am deeply grateful to our dedicated scientists, collaborators, and staff for their tireless efforts in advancing the mandate of the institute.

I thank the Editorial Board for their sincere efforts in bringing out this Newsletter. I also thank all the staff members of ICAR-NIASM for their contributions to this issue. I invite you to explore the content of this newsletter and join us in celebrating the accomplishments of ICAR-NIASM.

ksreddy

31st June, 2023 (K Sammi Reddy)

# RESEARCH HIGHLIGHTS

## Identification of drought tolerant ascorbic acid rich chickpea genotypes

*Basavaraj PS*

An experiment was conducted for 3 years (2020, 2021 and 2022) during rabi season at two locations (NIASM, Baramati and MPKV, Rahuri) to identify drought tolerant chickpea accessions by screening 106 chickpea genotypes (including checks). A total of 10 found drought tolerant with high ascorbic acid in seed and leaf as well.

| Sl. No. | Genotype ID | FC (%) | Leaf AsA (µg $g^{-1}$ FW) | Seed AsA (µg $g^{-1}$ FW) | GY (q $ha^{-1}$) |
|---|---|---|---|---|---|
| 1 | BDNG-2018-15 | 30-35 | 367.12 | 132.99 | 20.64 |
| 2 | PG-1201-20 | 30-35 | 361.25 | 133.57 | 23.08 |
| 3 | C-19315 | 30-35 | 357.34 | 126.98 | 16.58 |
| 4 | C-19186 | 30-35 | 349.51 | 131.50 | 22.89 |
| 5 | Phule Vijay | 30-35 | 327.64 | 110.48 | 22.56 |
| 6 | Phule Vikrant | 30-35 | 323.37 | 124.50 | 20.03 |
| 7 | BDNG-2017 | 30-35 | 312.71 | 66.33 | 18.39 |
| 8 | PG-1012-15 | 30-35 | 309.50 | 73.98 | 21.65 |
| 9 | C-19190 | 30-35 | 309.01 | 109.32 | 20.07 |
| 10 | C-19291 | 30-35 | 308.79 | 66.51 | 21.23 |

## Identification of cowpea germplasm accessions tolerant to High temperature stress

*Basavaraj PS*

Two years of study at NIASM and NBPGR-RS, Jodhpur (2022 and 2023 summer) lead to identification of trait specific germplasm of cowpea for high temperature stress tolerance

| Germplasm type | Trait | Genotypes |
|---|---|---|
| Vegetable type | Very early (Escape Mechanism) | EC-724484, EC-724740, EC724484, EC-723684, IC-488084, IC488077, EC-243999, IC-259159, IC410043, IC554414 |
| Grain type | High yield under stress and control | EC240930,EC-240926, EC-240884, EC-107151, EC-240874, EC-121826, EC24081, EC240741, EC240829, IC-488085, EC-240902, EC241078, EC 244133, IC 488268, IC 488222, EC 149469, EC 241035, EC 240995, EC 240989-A, EC 240878, IC 400155, IC 402101, IC 426824, IC 472252, EC 240900, EC 243995, IC 488124, EC 243927, EC 240625, IC 402176, IC 596961, IC 426824, IC 488067, IC 548288, IC 472254, IC 488124, EC 240897-1, EC 240924, EC 240625, IC 605507, IC 421917, IC 596961 |
| Fodder type | Higher fodder yield | EC 240891, EC 107182, EC 240917, EC 240875, EC 240890, EC 240801, IC 488112, IC 488119, IC 488131, IC 488085, EC 242128, EC 149458, EC 243938, EC 723742, EC 244121, EC 723851, EC 241058, EC 723735-B, IC 488270, IC 488239, IC 488109, EC 244175, EC 724252, EC 723796. EC 723836, EC 244148, EC 723674, EC 23850, EC 240648, IC 397983, EC 240630, EC 240891, EC 100094, EC 240966-A, IC 402125, IC 402103, IC 488195, IC 488146, IC 598466, IC 569092, IC 594504, IC 560928, IC 369857, IC 488246, IC 471387, IC 488171, IC 561238, IC 590841, IC 471435 |
| Dual Purpose | High grain, fodder yield | IC 488095 |
| Grain Type | High leaf PS-II | EC 724764-B, IC 560916, IC 548288, EC 240966-A, EC 724905, EC 724484, EC 240989-A, EC 241058, IC 402097, EC 240868, IC 548860, IC 507157,EC 724805, IC 488185, IC 418505,C 402161, ,EC 723908, IC 402111, IC 554414, EC 24081, IC 58905,IC 488085, IC 488135, EC 97167, EC 723743, EC 240824, IC 554347, IC 420660, IC 471955, EC 149469, IC 397397,EC 243999, EC 724742, IC 401315, IC 548859, EC 240676, EC 240902, IC 488065, EC240635, EC 724547, IC 402125, IC 488067, IC 426809, IC 472254, EC101775, IC 488264, IC 560917, EC 724872, |
| Grain Type | High pod florescence (Fv/Fm) | EC 148709, EC 240900-A, EC 240861, EC 240890, EC 244133, EC 244175, EC 244075, IC 397397, IC 402105, IC 401315, IC 402090, IC 402159, IC 402099, IC 418505, IC 488146, IC 488065, IC 488063, IC 554414, IC 512204 |

## Identification of potential promising and unique mutants in chia

*Boraiah KM*

In the M3 generation, observed some of the novel/new traits in a few mutant lines. The traits include phyllotaxy/Rosset type and dense and compact panicle-shaped. Few stable (90%) mutant lines with complete and partial chlorosis, cup-shaped cotyledon/ curly leaf (at a later stage), early

flowering, pigmented plants with bold seeded lines were identified and some them can be registered as genetic stocks within one or two years. The seed weight of mutant lines 125 and 94 (bold-seeded) was more compared to the wild type (Fig. 1 Avg.). Within these lines, plant-wise seed weight variation was observed indicating the scope for the selection of extra-bold types (Fig. 1, 1-10 lines).

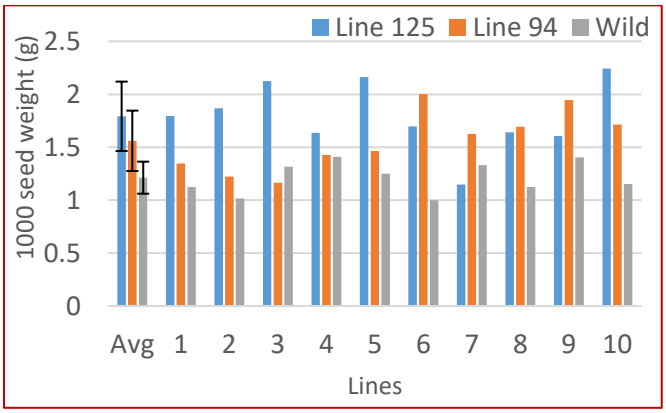



*Figure 1. Average and within-line variation for test weight (gm) in mutants and wild type*

## Effect of sowing dates on flowering phenology and seed yield of chia under shallow basaltic soils

*Harisha CB*

To standardize the ideal time of sowing in chia (*Salvia hispanica*) the sowing was taken up from 1st July to 1st February at fortnightly intervals. The flowering behaviour and seed yield were recorded to find the suitable sowing window. Flowering stages were recorded per the BBCH scale suggested by Brandan et al., (2019). The results of two years showed that early sowing from June or July leads to more biomass production and takes longer for maturity (130-140 days). This also affects the sowing of regular kharif crops. It was observed that sowing from 15th September to 30th November made the crop mature in less than 100 days. This helped in achieving better water saving and getting kharif crops. Therefore, sowing of chia crop from the first week of August to the first week of September realizes a higher seed yield of 793-811 kg/ha. If sowing beyond 15th December, it is highly uneconomical due to partial flowering and low yield. The flower parts get converted to vegetative parts due to the prevalence of long-day situations. However, for genetic improvement, two generations of the crop could be achieved if sowing 1st generation on 1-15st July and 2nd sowing on 15-30th November.

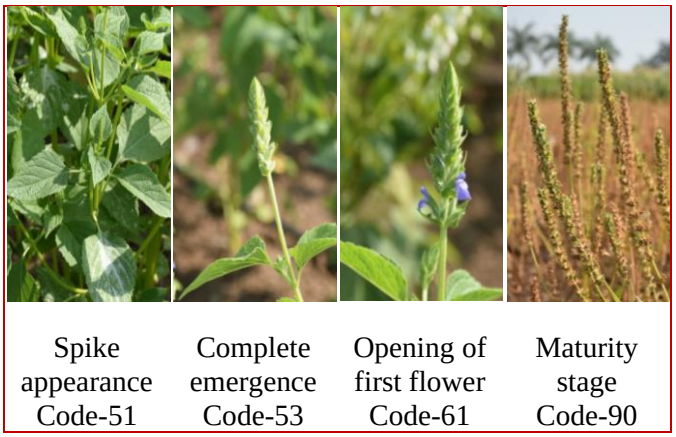



*Figure2. Phenological stages of chia from flowering to maturity*

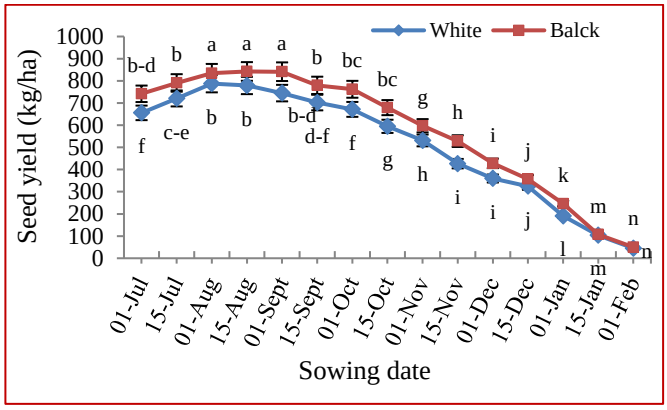



*Figure 2. Effect of sowing dates on seed yield of chia*

## Evaluation of foxtail millet accessions under low soil nitrogen conditions in the shallow basaltic gravelly soils

*Boraiah KM*

About 118 accessions of foxtail millet were evaluated under low N soils of native soils at ICAR-NIASM, Baramati to study the physio-logical and phenotypic responses of foxtail millet accessions under low soil nitrogen. All the accessions showed a reduction in plant height, no. of leaves, leaf and panicle length, and yield. Over all 23 % of chlorophyll reduction was observed during early vegetative growth (Fig. 3). These cumulative effects on plant growth and physiological traits attributed 58% yield reduction. Based on high frequency among the top 10 genotypes under each index and overall ranking - FXM70, FXM74, FXM21, FXM6, FXM34 & FXM39 (NIASM codes) were considered as best genotypes.

*Figure 3. Variation of plant growth, tillering, & root traits in low N tolerant and susceptible lines of foxtail millets*

## Identification of groundnut genotypes tolerant for pre- and post-flowering drought (rabi-summer 2022-23)

*Boraiah KM*

Forty-eight genotypes comprising 44 accessions (from ICRISAT) and 4 released varieties as Checks (Kadiri Lepakshi, Phule Unnati, DH-257, R-2001-2) were evaluated for drought tolerance at pre- and post-flowering stages during rabi-summer 2022-23. Based on high frequency & ranking of stress indices identified tolerant accessions viz. ICG4543, ICG3673, ICG3102, ICG3584, ICG 1519, ICG6703, ICG11249, ICG14127 & ICG 4684 for pre- and post-flowering drought. Among varieties Kadiri Lepakshi & Phule Unnati were highly drought tolerant.

## Quinoa (Chenopodium quinoa) as an alternative crop in shallow basaltic soils of Deccan Plateau

*Aliza Pradhan*

A field experiment was conducted to evaluate the effect of different sowing dates, irrigation and nitrogen doses on quinoa in native shallow basaltic soil at ICAR-NIASM. The experiment was laid out in split split plot design with date of sowing (4 levels) as main plot: 1st November (D1); 15th November (D2), 1st December (D3), 15th December (D4); irrigation (2 levels) as sub plot: irrigation at 80% crop evapo-transpiration (ETc) (I1); irrigation at40% ETc (I2); and nitrogen doses (3 levels) as sub-sub plot: 100 kg N $ha^{-1}$ (N1); 150 kg N $ha^{-1}$ (N2); 200 kg N $ha^{-1}$ (N3) with three replications. The results revealed that sowing in 1st week of November with 40% ETc and 100 kg N $ha^{-1}$ will give quinoa seed yield of 17 q $ha^{-1}$. Accordingly, the protein content of seeds were estimated and the protein yield was calculated which ranged between (50-200) kg $ha^{-1}$ (Fig. 4). The saponin content of quinoa seed and husk ranged between (0.6-1.6)%.

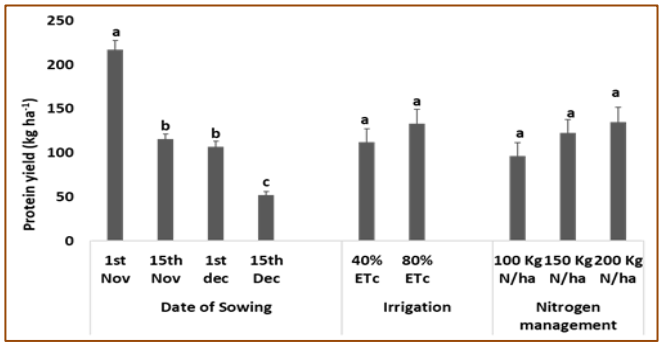



*Figure 4. Effect of management strategies on protein yield (kg $ha^{-1}$) in quinoa*

## Soil Chemical Quality Index

*Gaikwad BB*

The village level Soil Chemical Quality Index (SCQI) has been calculated for India using weighted sum approach. In this approach each of the 12 nutrient were given weightage based on expert opinion for its categorization into low medium and high levels and cumulated to calculate the Soil Chemical Quality Index.

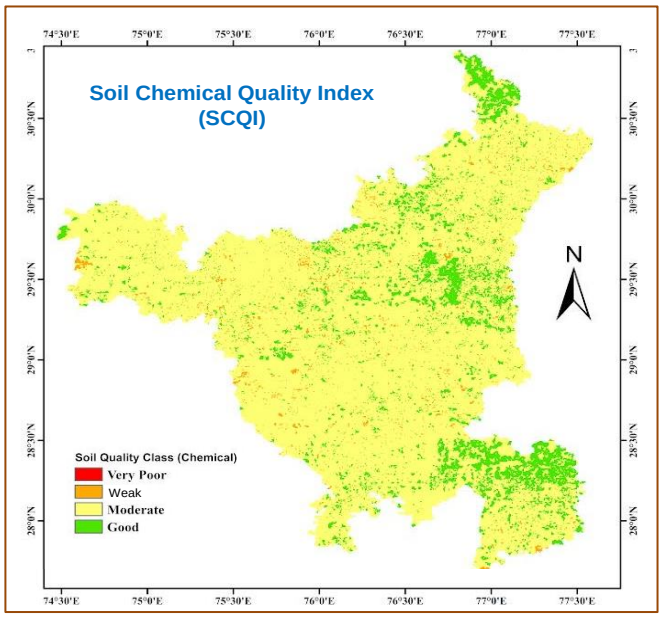



*Figure 5. Soil Chemical Quality Index Map of Haryana.*

Further refining the methodology particularly for Haryana State the farmer level geo-referenced datasets were first reduced by removing duplicates, imposing threshold limits and geofencing approach. Further Machine learning models were developed for amputation of missing values. Among the several Interpolation techniques used those exhibiting lowest RMSE (Root Mean Square error) were used to develop interpolated Raster

maps of each individual nutrient. Further these raster maps were used to calculate the Soil nutrient scoring based on linear and non-linear scoring functions and integrated into a single SCQI using Numero, Additive and Weighted approaches. This Index classifies the soil into four levels of fertility classes that can used for getting insights into fertility status at sampled and unsampled locations.

## Assessment of fodder scenario and sugarcane tops utility in Maharashtra

*Kurade NP, Pawar SS, Nirmale AV, Gaikwad BB*

The total fodder requirement of Maharashtra calculated based on 2019 livestock census data is 1406.55 lakh tonnes of greens and 938.68 lakh tonnes of dry fodder. The area under fodder crops being significantly less (3.06% of the cultivated area), the availability of fodder and feed resources is much less compared to its requirement resulting in dry fodder shortage of 31.3% and a green fodder shortage of 59.4% (ICAR-IGFRI, 2020). This necessitates reliance on crop residues or alternate fodder sources. Maharashtra recorded 1,320.31 lakh tonnes of sugarcane production in 2022 with estimated sugarcane tops (STs) of more than 225 lakh tonnes. Though STs are not a better feed option for livestock, feed conversion efficiency was high at 20% and low at 30% sugarcane top feeding through total mixed ration in calves (Mahala *et al.* 2013). This suggests that even 50% of available STs if used for mixed silage production, may fulfil the 15% requirement of green fodder for livestock. Currently, STs are mostly fed directly to livestock or may be used in lesser proportion for silage preparation. Particularly during water scarcity periods, the immature sugarcane crop is also fed as livestock fodder. The analysis carried out for the districts of Maharashtra state revealed that STs used either as green fodder (during Oct-Mar) or as mixed silage with 50% composition (across the year), can feed about 50-70% of livestock population across four districts (Kolhapur, Pune, Satara & Solapur); 30-50% in three districts (Sangli, Ahmednagar & Latur), 10-30% in 7 districts and less than 10% in remaining 15 districts producing sugarcane (Fig. 6). This provides an insight that silage production and consumption will therefore be largely local rather than transported across districts. However, by bringing more area under cultivation of short duration fast growing fodder species during water availability period either exclusively or by replacing partly the long duration crops like sugarcane will help reduce green fodder shortage during scarcity period. This strategy would be more beneficial for sugarcane growers rearing livestock, owing to the faster biomass production rates and nutritional quality of fodder crops compared to sugarcane. This grown fodder can also be utilized in mixed silage production. Furthermore, by popularizing mechanized shredding/cutting practices of STs and other green fodder for mixed silage preparation either through fixed or mobile machines and making arrangements for silage bags/pits can help timely conversion of all available STs into fodder silage. Mechanized mixed silage making through suitable small farmer groups, thus has potential to improve the availability of better forage options for sustaining livestock production in addition to generating employment opportunities in the drought prone areas of tropical regions.

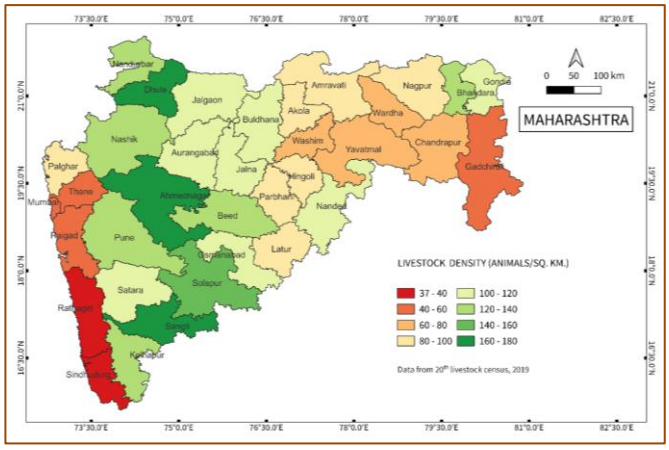



*Figure 6. Livestock density (Animals/sq. km.) in districts of Maharashtra as per livestock Census 2019.*

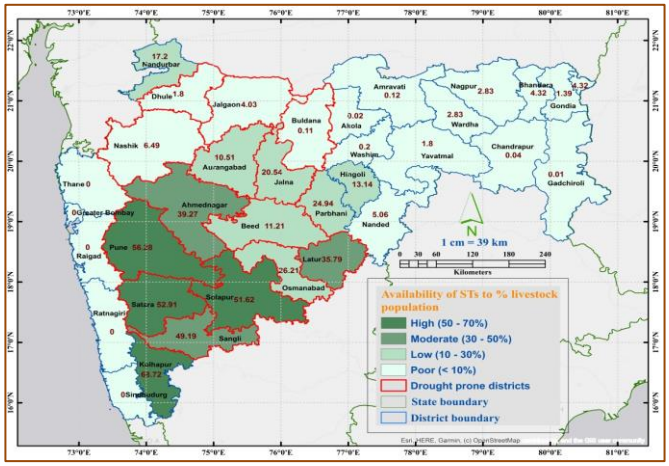



*Figure 7. Availability of STs either as green fodder (during Oct-Mar) or mixed silage (across the year) to the percent of livestock in drought prone and other districts of Maharashtra.*

## Mapping of district level methane emission using IPCC Tier-II protocol

*Gopalakrishnan B*

The district level methane emission (Enteric Fermentation) was mapped using 20th livestock census data and IPCC Tier-II protocol, 2019. The total estimate ranged from 13.85–16.40 Tg of methane per year from enteric fermentation compared to the Tier I protocol estimate of 20.74 Tg of methane per year. The emissions from cattle were the highest followed by buffaloes, sheep and goats.

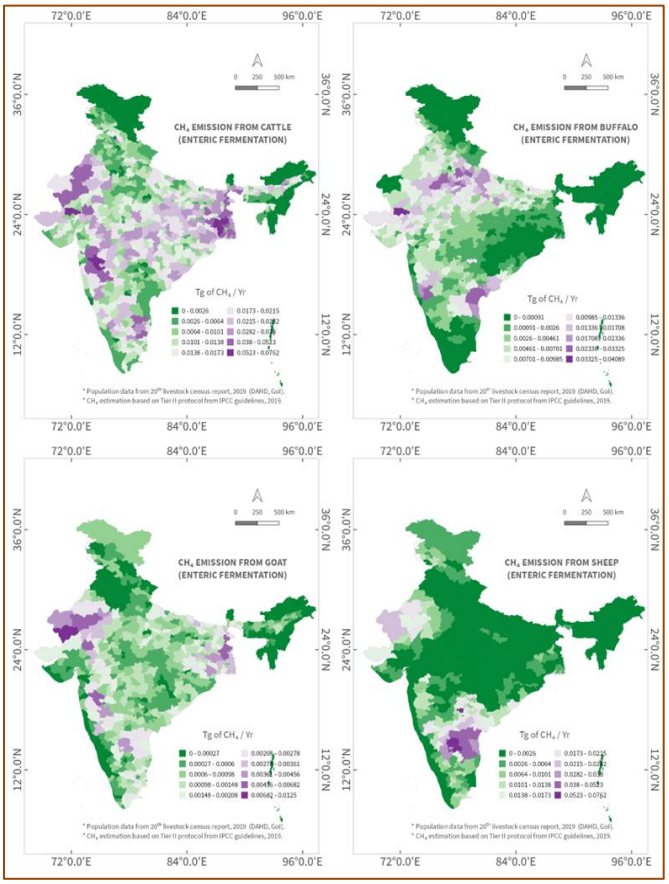
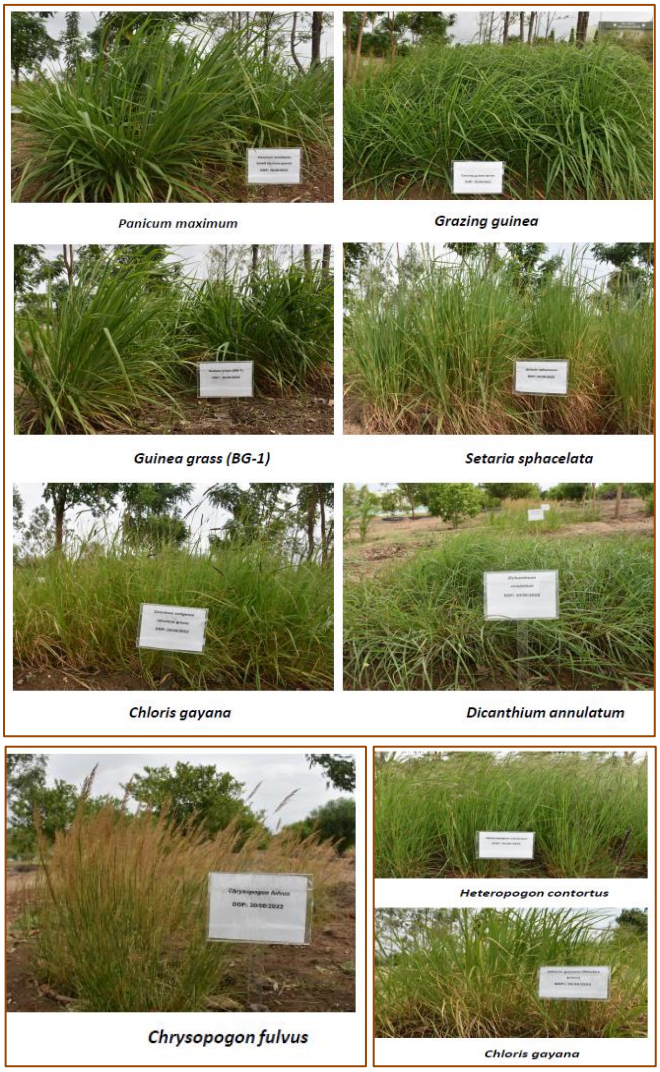



*Figure 8. Methane emissions from enteric fermentation.*

## Establishment of perennial grasses cafeteria for multipurpose uses: Genetic garden

*Halli HM*

The nursery of range grasses was established at medicinal and aromatic crops garden at ICAR-NIASM. The soil is poor with respect to physical and chemical properties. These range grasses can supplement the fodder supply (year-round supply) & can be used in alternate land use system studies to improve the degraded lands under extreme climate due to higher diversity and resilience.




## Development of prototype of ambience monitor

*Gopalakrishnan B*

A breadboard prototype of ambience monitor was completed. The prototype monitors the ambient temperature, relative humidity, wind speed, and solar radiation. The real-time data was displayed using an OLED display module. The prototype was connected to an IoT platform through a Wi-Fi router and the data was successfully transmitted and stored. The data can be displayed using the visualization tools available with the platform.

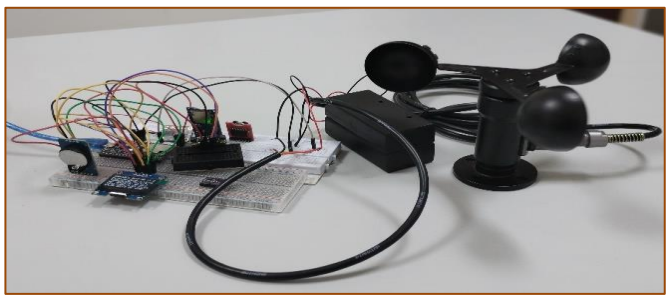


*Figure 8a. Breadboard setup of protype*

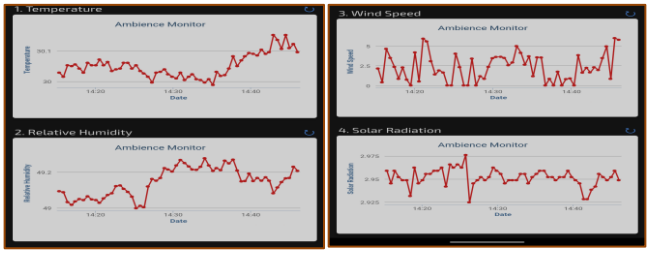



*Figure 8b. Readings from ambience monitor*

## Sunburn management through artificial shading and canopy management in Dragon fruit (*Hylocereus spp.)*

*Kakade VD*

During the second year trial conducted during summer season 2023, shade net reduced light intensity by 50-60%; thereby eliminating completely sunburn issue using artificial shading. Further shading also resulted in reduction of disease incidence, early flowering and emergence of new sprouts. In the second year trial of canopy management experiment in dragon fruit it was observed that pruning enhanced new shoot formation, fruit bearing branches and reduced chances of sunburn and disease incidence.

## Greenhouse gas and energy budgeting in Guava and Pomegranate

*Kakade VD*

In a study conducted for energy budgeting in Guava and pomegranate fruit orchards, the highest GHG emissions were attributed to use of Electricity followed by fertilizer and diesel and lowest for herbicide. GHG budgeting estimates net mitigation of 31.81 and 28.81 ton $CO_2$ eq. $ha^{-1}$ from Guava ($5^{th}$ year rotation) and Pomegranate (7th year rotation) cultivation, respectively.

## Unique Red/Bronzy fennel genotype

*Harisha CB*

A unique bronzy/red colour fennel genotype having pigmentation on the stem, leaves, and seeds was identified and selected from a single plant in the spice cafeteria in 2018. The inflorescence was bagged to self and few were left for open pollination. The second generation, the selfed and open-pollinated seeds, were sown separately in shallow basaltic soils of the ICAR-NIASM farm (2021-22). Unique features of the genotype such as red pigments on the stem, young leaves and young fruits were recorded. This trait is unique and not available in any germplasm collection. In selfed plants, 3-7% segregation was observed; in open-pollinated plants, 25-52% segregation was observed. The morphological characters of bronzy/red type and green type fennel are given in the table below.

*Segregation of bronzy/red and green types in selfing and open pollination*

| | Total no. of plants | No. of red plants | % Segregation |
|---|---|---|---|
| Red Self pollinated | | | |
| 1 | 26 | 24 | 7.7 |
| 2 | 30 | 29 | 3.3 |
| Red open pollination | | | |
| 1 | 26 | 15 | 42.3 |
| 2 | 24 | 18 | 25.0 |
| 3 | 25 | 12 | 52.0 |
| 4 | 30 | 22 | 26.7 |
| Green open pollination | | | |
| 1 | 26 | 6 | 76.9 |
| 2 | 24 | 5 | 79.2 |
| 3 | 25 | 9 | 64.0 |
| 4 | 30 | 7 | 76.7 |

*Morphological characters of bronzy/red & green type fennel*

| Characters | Bronzy/ red type | Green type |
|---|---|---|
| Plant height (m) | 1.7 | 1.6 |
| Primary branches | 14 | 18 |
| Secondary branches | 23 | 29 |
| No. of Umbel | 27 | 38 |
| Umbellets/umbel | 23 | 35 |
| Seeds/umbellete | 32 | 30 |
| Seed yield/plant (g) | 12.8 | 15.6 |
| Days to maturity | 160-165 | 160-165 |

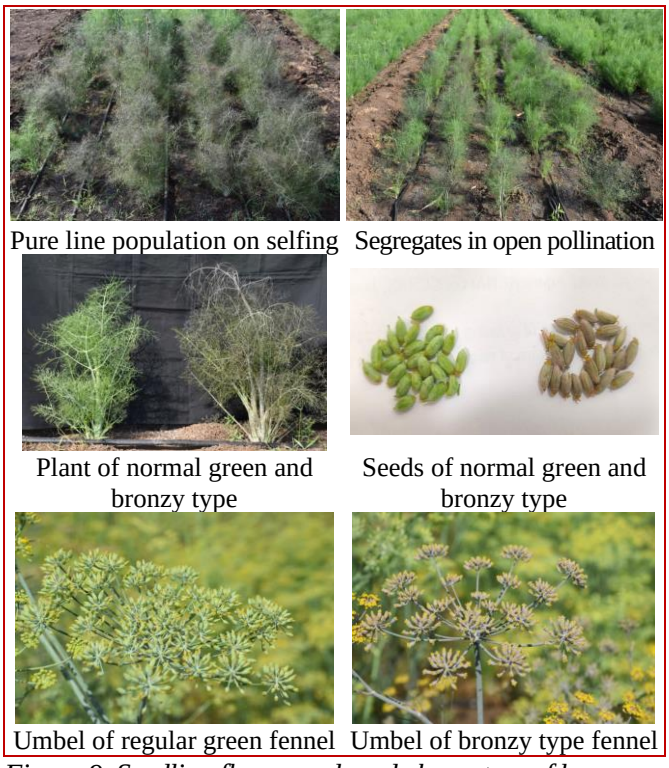



*Figure 9. Seedling flower and seed characters of bronzy and green fennel*

## Evaluation of new soybean genotypes for intercropping with sugarcane in spring season for area expansion in India

*Halli HM*

Evaluated new soybean genotypes with sugarcane as an intercrop to check the suitability and yield potential during the non-conventional season (off-season) in different locations of the country (Uttar Pradesh, Karnataka, Maharashtra) by the ICAR-Indian Institute of Soybean Research, Indore, Madhya Pradesh. As a part of the study, five soybean genotypes were sown as intercrop in the farmer's sugarcane field (Malegaon, Baramati, Pune, Maharashtra) on 15th February 2023 in medium-deep black soils. Results revealed that all the soybean varieties performed comparatively superior during the off-season without much yield loss. Greater grain yield was recorded in the descending order of genotypes; NRC-131 (22.75 q $ha^{-1}$) > NRC-130 (20.99 q $ha^{-1}$) > NRC-136 (20.03 q $ha^{-1}$) > YMV-11 (13.34 q $ha^{-1}$) > JS-20-34 (10.86). Despite, late sowing (I week of March), rapid coverage of sugarcane canopy, and higher temperature during reproductive stages, these genotypes showed the potential to perform better as an intercrop in sugarcane. Therefore, this belt of sugarcane would be the potential option to expand the soybean area under cultivation without much loss in the sugarcane yield and as a climate-resilient strategy to increase soybean production.

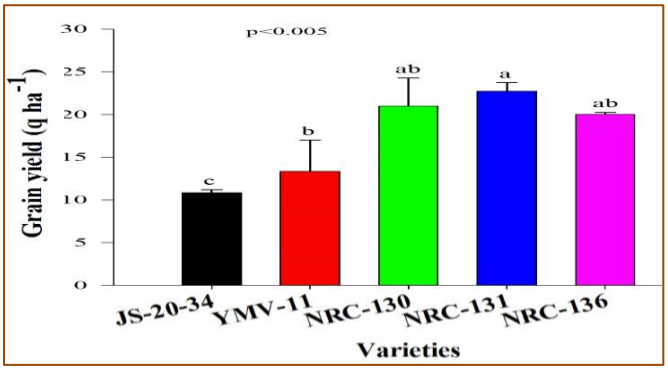



*Figure 10. Seed yield of soybean varieties as intercrops with sugarcane*

## Collection of Mango (*Mangifera indica L.*) germplasm for salinity and drought tolerance studies

*Morade AS*

Fruits of 28 local mango germplasm have been collected from semi-arid zone during summer season of 2023. for evaluation of its rootstock traits with special reference to drought and salinity tolerance during 2023 to 2027.

*Figure 11. Variation in mango fruit size, shape and color collected during 2023*

## Effect of intercrops & Cutting height on green fodder yield of Leucaena

*Chavan SB*

An experiment was conducted to investigate the impact of Leucaena-based silvipasture systems on both fodder productivity in degraded soil environments. Four different intercrops (Medicago sativa, Desmanthus virgatus, Cenchrus ciliaris, and Cenchrus setigerus) were intercropped alongside two different cutting height treatments for Leucaena leucocephala, specifically at 50 cm and 100 cm. The results indicated that the 100 cm cutting height for Leucaena, when intercropped, resulted in a significantly higher yield of green fodder biomass compared to either the sole Leucaena or the 50 cm cutting height treatment.

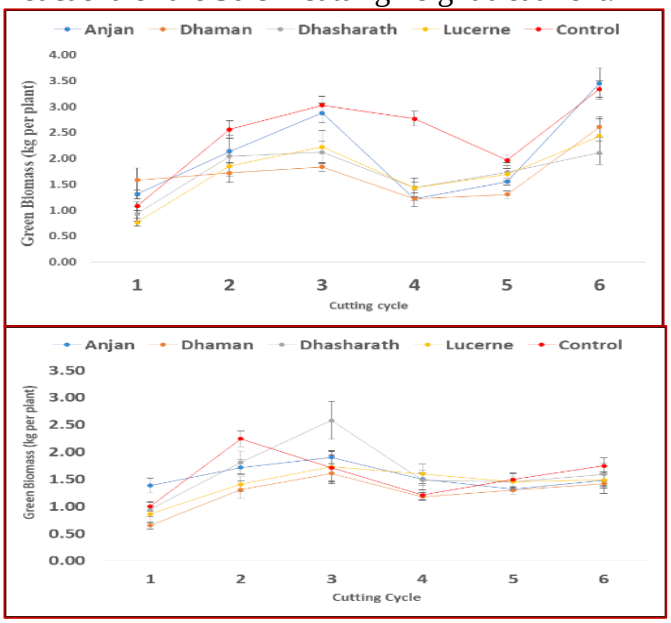



*Figure 12. Effect of intercrops & Cutting height on green fodder yield of Leucaena*

This trend was also observed in the green fodder yield of the intercrops, where the 100 cm cutting height treatment exhibited the least reduction in biomass. Overall, the intercropping systems produced between 11 to 27 tonnes of green fodder biomass, regardless of the type of crops or cutting height. These findings emphasize the potential benefits of intercropping with Leucaena at a greater cutting height in terms of enhancing both fodder production and soil health.

### Biomass & carbon stock of fruit and agroforestry systems

*Chavan SB*

Perennial fruit and agroforestry tree species were established in the CIFS model to enhance the carbon sequestration potential with other tangible benefits (Fig. 13 a). After the establishment of various components, about 2.52 tonnes of biomass and 1.19 tonnes of carbon were stored in the perennial tree components of the CIFS. Boundary plantation of teak added highest quantity of carbon followed by pomegranate. A comprehensive evaluation of cattle and goat fodder requirements revealed a total consumption of 20.9 metric tons and 10.4 metric tons, respectively. Notably, the NB Hybrid variety accounted for approximately 28% of the total fodder production within the CIFS system (Fig. 13 b).

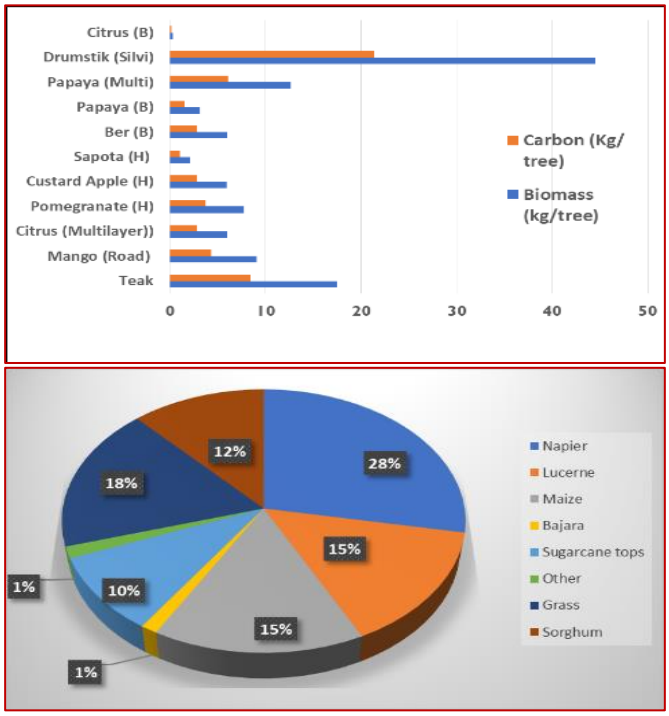



*Figure 12. Effect of intercrops & Cutting height on green fodder yield of Leucaena*

## NEW INITIATIVES

### ICAR-NIASM signs MOU with Novem Solutions Pvt. Ltd. & MITCON Consultancies

On June 2, 2023, a meeting took place at the ICAR-NIASM involving representatives from ICAR-NIASM, Novem Solutions Pvt. Ltd. and MITCON Consultancy and Engineering Services Ltd. from Pune. The primary objective of the meeting was to formalize the signing of Memorandums of Understanding (MoUs) between the participating parties. The meeting began with opening remarks from the representatives of the private companies. Dr K Sammi Reddy, the Director, ICAR-NIASM, expressed gratitude to Novem Solutions Private Limited and MITCON Consultancy and Engineering Services Limited for their keen interest in partnering with ICAR-NIASM Baramati. He emphasized the significance of collaboration in addressing the challenges posed by abiotic stress on agriculture, underscoring the need for innovative solutions to enhance agricultural productivity. Mr N Sagar, Chief Technology Officer of Novem Solutions Private Limited, and Mr Nalin Shah, Senior Vice-President of MITCON, reciprocated the sentiment and acknowledged ICAR-NIASM's expertise and research capabilities. They emphasized the importance of public-private partnerships in driving agricultural advancements and reassured their organizations' commitment to the collaboration. During the meeting, the parties engaged in discussions to outline the scope and objectives of the Memorandums of Understanding. NIASM planned a project titled "Investigating the Impact of Varying Nutrient Composition on Morphometric, Physiological, and Yield Traits in Potato." Additionally, consultancy work will be carried out with MITCON on "Development of Agroforestry Business Models for Long-Term Sustainability." The key areas of focus agreed upon were knowledge sharing, research collaboration, technology transfer, and capacity building.

### Mass multiplication of alternate fodder species

Mass multiplication of alternate fodder species was initiated at the livestock unit. HDPE sheets were laid in shallow beds of 12ft*12ft*1ft dimensions and filled with soil up to 10cm and water from fisheries ponds. To this cow dung and other micronutrient mixtures were added and allowed to stabilize for 2 days. Cultures of Azolla, minor duckweed and greater duckweed were added and mass multiplication was initiated. After 1 week, about 22 kg of Azolla was collected as the first harvest from a single bed and was introduced to buffaloes @ 1 kg/ day along with conventional feed.

## MAJOR EVENTS

### Visit of Hon'ble Member of Parliament Shri Sharadchandra Pawar to ICAR-NIASM

Hon'ble Member of Parliament Shri Sharadchandra Pawar along with Dr Ranveer Chandra, CTO, Agri Food and Executive Director, Microsoft Networking Research and Dr Ajit Jaokar, Course Director (AI), Oxford University visited ICAR-NIASM, Baramati on 03.01.2023 to overview the research activities carried out on abiotic stress management and to explore opportunities for collaboration particularly on use of artificial intelligence in agricultural research. Dr K Sammi Reddy, Director, ICAR-NIASM, briefed about research mandate and progress of the institute since its inception from 2009. Dr J Rane, Principal Scientist and in-charge of National Plant Phenomics facility, explained application of machine vision and automation being employed for understanding stress responses of crop plants with state-of-the-art facility functioning at the institute. In addition, his team could demonstrate the affordable and cost-effective field phenomic tool developed at NIASM. Dr Prashantkumar Patil, Hon'ble Vice Chancellor, MPKV, Rahuri; Dr Shankarrao Magar, Former Vice Chancellor, DBSKKV, Dapoli; Shri Prataprao Pawar, Chairman, Sakal Media group and Trustees of Agriculture Development Trust (ADT) along with progressive farmers participated in the event.

### Winter School on "Climate Change & Abiotic Stresses Management Solutions for Enhancing Water Productivity, Production Quality and Doubling Farmers Income in Scarcity Zones"

ICAR-NIASM organized a ICAR sponsored 21 days Winter School on "Climate Change & Abiotic Stresses Management Solutions for Enhancing Water Productivity, Production Quality and Doubling Farmers Income in Scarcity Zones (5-25 January 2023)" on 05$^{th}$ January 2023. The session began with a brief introduction to trainees who participated from ICAR Institutes, SAUs, and KVKs across the country. Dr KV Prasad, Director, Directorate of Floriculture Research, Pune, Chief Guest of the function highlighted the uniqueness and importance of the training topic, especially "Climate change and Abiotic Stress Management Solutions" and the role of ICAR-NIASM in developing climate-smart technologies for improving crop/water productivity, production quality and farmers income in scarcity zones. Dr K Sammi Reddy, Director, ICAR-NIASM emphasized on climate-resilient agriculture for abiotic stress management and elaborated the institutional efforts towards achieving the same. Dr GC Wakchaure, Senior Scientist and Course Director gave an overall overview of the Winter School, objectives and lectures schedule to the participants. Total 25 multidisciplinary trainees, HoS, scientific, technical and administrative, SRF, YPs and contractual staff participated in the event.

## ICAR-NIASM, Baramati participated and assisted in organizing national conference on "Globalization of India's Crop Improvement Research"

The national conference on "Globalization of India's Crop Improvement Research" was organized by Foundation for Advanced Training in Plant Breeding (ATPBR) at Yashwantrao Chavan Academy of Development Administration (YASHADA), Pune, during 19-21 January, 2023. As a co-organizer ICAR-NIASM displayed climate resilient crops like millets (finger millet, foxtail millet, proso millet, barnyard millet, little millet, kodo millet, pearl millet, and sorghum), abiotic stress tolerant varieties of wheat, soybean, chickpea and groundnut. Further, showcased live and seed materials of new crops like chia, quinoa and Dragon fruit including the variegated chia panicle mutants and planting materials of Dragon fruit hybrid. Dr Boraiah explained on going crop improvement activities including mutation breeding to the delegates and participants during the exhibition. Dr Basavaraj, Scientist (Plant Breeding) acted as rapporteur for session-V on "Harnessing talent through capacity building: India's strength is young talent but better opportunities for them in India as well as in other countries is a challenge" on 21st January 2023. Dr J Rane, Principal Scientist (Plant Physiology) chaired the session-VII on "Crop improvement in protected cultivation- Opportunities for export-oriented research and for external markets."


## Celebration of 74th Republic Day 2023

74th Republic Day was celebrated at the ICAR-NIASM the 26th January, 2023. Scientists, Technical, Administrative, Senior Research Fellows, Young Professionals and supporting staff filled with a feeling of patriotism and dedication gathered in front of the administrative building. The celebration started with the hoisting of the National Flag by the Director, Dr K Sammi Reddy. In his speech, he highlighted the importance of the day and expressed his gratitude to all those who contributed to the national development.


## Bimonthly structured Meet of NABARD Officers and DDMs to ICAR-NIASM

On February 4, 2023, NABARD officers, headed by Dr Milind Bhirud (General Manager) and Shri Vijay Deshpande (Deputy General Manager), visited ICAR-NIASM. Dr K Sammi Reddy, the Director of ICAR-NIASM, emphasized the institute's efforts to mitigate abiotic stress and urged the gatherings to promote its technologies through NABARD channels. During the visit, Dr Bhirud from NABARD noted the work of IACR and its institutions to enhance farmers' livelihoods through technological interventions in response to climate change. The NABARD officials visited the facilities of ICAR-NIASM, including the black soldier fly unit, fruit orchards, plant phenomics facility, brinjal grafting plot, livestock experimental unit, climate-smart integrated farming systems, silvipasture and sandalwood-based agroforestry systems, and medicinal garden.

## Organization of short-term training on "Non-destructive Phenotyping for Abiotic Stress Tolerance in Crops and Agroforestry"

Training started with the inauguration by Chief Guest Dr J Rane, Director, Central Institute of Arid Horticulture, Bikaner, along with Dr K Sammi Reddy, Director, ICAR-NIASM, Dr Gurumurthy S, Course Director, Dr Sangram Chavan and Dr Vijaysinha Kakade and Course Co-director. Dr Gurumurthy gave a brief introduction to the training programme. Director ICAR-NIASM, gave his remarks and he wished for the success of the

training programme and inspired the participants to an academically rewarding stay in NIASM. Dr J Rane during his speech emphasized the phenomics facility and its implementation in abiotic stress tolerance, and the scientific community with different angles of view to tackle the climate change issues and its effect on crop productivity. He motivated everyone to actively participate in the training to get benefited.

## Organization of on-location training program on "Climate resilient agriculture & livelihood for NGOs and FPOs"

ICAR-NIASM in collaboration with Bankers Institute of Rural Development (BIRD), NABARD, Lucknow organized an on-location training program on "Climate resilient agriculture & livelihood for NGOs and FPOs" during 13-17 February 2023 at ICAR-NIASM. The training programme included group activities of participants, lectures on impacts and management of climate change, abiotic stress adaptation and mitigation strategies developed by ICAR-NIASM *viz.*, new crops (Dragon fruit, quinoa), climate smart integrated farming system, field visits to Krishi Vigyan Kendra, ADT, Baramati and Malegaon co-operative sugar factory. Dr K. Sammi Reddy, Director, ICAR-NIASM in his introductory remarks, highlighted several aspects of climate resilient agriculture that can be practiced by NGOs and FPOs *viz.*, community farming, custom hiring services, seed grading, seed and fodder bank etc. Dr Snehal M Bansod, FM, BIRD elaborated on the importance of climate change, related policies, rural credits, and facilities provided by NABARD to NGOs and FPOs towards climate-centric issues. Dr Amit Lal, FM, Bird highlighted the importance of revenue-generating models for NGOs and FPOs in the changing climate scenario. Around 30 participants including representatives from NGOs, FPOs, and various academic organizations participated in the training programme.

## ICAR-NIASM and Bankers Institute of Rural Development (BIRD), NABARD Collaborate to Host a Training Program on Climate Financing for New Crops and Agroforestry

ICAR-National Institute of Abiotic Stress Management in collaboration with Bankers Institute of Rural Development (BIRD), NABARD, Lucknow organized an on-location training program on "Bankable Models for Mainstreaming Climate Financing for Banks for New crops & Agroforestry" during 15-17 February, 2023 at ICAR-NIASM. The training programme included introduction of participants, different sessions on abiotic stress adaptation and mitigation strategies developed by ICAR-NIASM, field visits to Krishi Vigyan Kendra, ADT, Baramati and Malegaon co-operative sugar factory. Dr K Sammi Reddy, Director, ICAR-NIASM in his inaugural speech, emphasized on monetary evaluation of ecosystem services of agroforestry, new crops and other climate smart practices for creating a win-win scenario of climate financing both for bankers and farmers. Dr Snehal M Bansod, FM, BIRD elaborated the importance of climate change, related policies, rural credits, and facilities provided by NABARD towards the climate-centric issues. Shri Amit Lal, FM, Bird highlighted the need to know the intricacies of different aspects of climate financing in the changing climate scenario. Around 30 bankers from different national and co-operative bank organizations participated in the training programme.

## ICAR-NIASM celebrates 15th Foundation Day

ICAR-NIASM celebrated its 15th Foundation Day on 20-21st February 2023. A State Level Workshop on 'Emerging Technologies for Enhancing the Productivity and Quality of Dragon Fruit in Water Scarce and Degraded Areas' was organized as part of Foundation Day celebration on 20th February 2023. Dr SK Chaudhari, DDG (NRM), ICAR, was the Chief Guest; Dr Kailas Mote, Managing Director, MSHMPB, Pune, Maharashtra was guest of honour and Sh. Anandrao Pawar, MDFA, Pune, Maharashtra was the Special Guest. Dr K Sammi Reddy, Director, welcomed all the dignitaries and participating farmers in his introductory remarks. Dr SK Chaudhary, DDG (NRM) gave insights about his association with the institute journey since its inception and its progress in infrastructure and research fronts. He congratulated ICAR-NIASM for the achievements in the area of Abiotic stress and wished a long success ahead. He also narrated about opportunities in Dragon fruit farming to the farmers. Dr Kailash Mote informed the participants about various schemes of Agriculture department of Maharashtra. Mr Anandrao Pawar narrated about the various constraints faced by Dragon fruit farmers in production as well as marketing. During Technical sessions-I, different experts from ICAR-NIASM and outside explained about different aspects of dragon fruit production to the participants. The function 15th Foundation Day celebration function was organized on 21st Feb. 2023. Dr NP Kurade, Convener of Foundation Day programme, welcomed all the guests and participants besides briefing about the various activities during foundation day celebration. Dr K Sammi Reddy, Director, delivered the welcome address and briefed the achievements of the Institute along with way forward. Dr NVPR Gangarao, Principal Scientist, CIMMYT delivered the fourth foundation day lecture on 'Crop Improvement Approaches for Effective Abiotic Stress Management in Cropping Systems: Achievements and Way forward.' Dr Harish Gandhi presented his perspective about institute stressing need for NIASM scientist to come forward for international collaborations. On the Foundation Day, institute felicitated progressive farmers, Best NIASM Scientific and technical staff, contractual (YPs, Skilled labour & Security) staff and sports awardees. The awards were distributed by Special guests Dr NVPR Gangarao and Dr Harish Gandhi principal Scientists from CIMMYT, Director and HoS. Progressive farmers were felicitated with awards for their significant achievements in agriculture. The celebration of the foundation day programme concluded with the National Anthem. A weeklong sport tournament was also organized on the occasion and winners were awarded. In the evening, cultural event was organized by the cultural committee. A full-pack grand celebration of the Foundation Day was concluded with encouraging and motivating words of Dr K Sammi Reddy, Director, ICAR-NIASM.


## Organization of "Field day-cum-Demonstration on Climate Resilient Dairy Production" and distribution of Dairy kits to SC beneficiaries

ICAR-NIASM and KVK, Baramati, jointly organized a "Field Day-cum-Demonstration on Climate resilient Dairy Production" under DAPSC 2022-23 scheme on 28th February 2023 at Rashin and Mirajgaon of Karjat Tehsil and Ahmednagar district. In the beginning, Dr NP Kurade briefed about the ICAR-NIASM and DAPSC programme carried out by the Government of India. He also explained how to use dairy kit inputs properly. Dr Vivek Bhoite from KVK, briefed the farmers about the important dairy production activities carried out at the Agriculture Development Trust and KVK, Baramati and its benefits. Dairy kits comprising 50 kg concentrate feed, 10 kg mineral mixture, two still buckets, milk can, milk measures (1lit. and half liter), 5 deworming tablets and two plastic ghamelas were distributed to about 27 beneficiaries from Rashin, Babhulgaon, Yesavadi, karpardi, Jalalpur villages (Karjat tehsil) who participated at Rashin and 17 beneficiaries, from Chilwadi, Thergaon, Ghumari, and Nimgaon

villages (Karjat tehsil), participated in the interaction meet at Mirajgaon. The beneficiary farmers expressed their happiness to receive the very useful inputs for their livestock under the scheme.

## Visit of Mr Stewart Collis of Gates foundation to National Plant Phenomics Facility

On 6th March, 2023 Mr. Stewart Collis along with trustees of KVK, Baramati visited national plant phenomics facility. Dr NP Kurade Principal Scientist welcomed the guest and briefed about NIASM institute its mandates and achievements. HoS of each School briefed about on-going activities and achievements of each school. Further, detailed about plant phenomics facility its function and utility in research and low cost filed phenotyping tool was also demonstrated. Overall, Mr. Stewart appreciated the progress made by NIASM in abiotic stress management and developing digital solution for abiotic stress problems.

## Field day cum farmers-scientist interaction meet on "Awareness about DAPSC programme and need assessment"

ICAR-NIASM organized a field day cum-farmers-scientist-interaction meet on "Awareness about DAPSC programme and need assessment" under DAPSC 2022-23 scheme on 14th March, 2023 at Sangavi (Old) village of Phaltan Tehsil, Dist. Satara. Dr Kakade welcomed the Sarpanch and the participants for the programme. Dr Nangare informed about various activities of the institute. Dr Kurade briefed about the DAPSC scheme of Government of India and various interventions/activities carried out under the programme for individual beneficiaries as well as self-help groups. Dr Nirmale briefed about various success storied emerged under the DAPSC programme carried out by the institute. All DAPSC committee members interacted and responded to the queries raised by the beneficiaries about the scheme. More than 60 beneficiaries participated in the programme.

## हिन्दी कार्यशाला वृतांत

राजभाषा कार्यान्वयन समिति के अध्यक्ष एवं राष्ट्रीय अजैविक स्ट्रैस प्रबंधन संस्थान के निदेशक महोदय डॉ के सम्मि रेड्डी के मार्गदर्शन में हिंदी भाषा के रुझान हेतु संस्थान में ३० मार्च, २०२३ को हिन्दी कार्यशाला का आयोजन किया गया। सदस्य सचिव डॉ वनिता सालूँखे ने उपस्थितों का स्वागत किया। कार्यशाला को आगे बढ़ाते हुए डॉ माधुरी दिगंबर प्रभुणे (प्राध्यापक, महिला महाविद्यालय बारामती) ने ''राजभाषा हिन्दी के विविध रूपों की जानकारी' इस विषय पर उपस्थित सभी को मार्गदर्शन किया। उन्होने विश्व में तीसरे स्थान पर रही हिन्दी के बोली भाषा, मानक एवं परिनिष्ठित भाषा, राजभाषा, राष्ट्रभाषा, संपर्क भाषा, प्रयोजनमूलक हिन्दी, राष्ट्रीय चेतना हिन्दी, एकता रूप हिन्दी एवं साहित्यिक हिन्दी जैसे हिन्दी के विविध रूपों के बारे में सभी को अवगत किया। संस्थान के निदेशक महोदय जी ने हिंदी भाषा के रुझान के लिए किए गए मार्गदर्शन पर समाधान जताया। इस कार्यशाला का संस्थान के ५० कर्मचारियों ने प्रत्यक्ष रूप से लाभ लिया। कार्यशाला की उपलब्धियों पर चर्चा करते हुए डॉ प्रवीण तावरे ने धन्यवाद ज्ञापन किया। डॉ परितोष कुमार ने कार्यशाला का सूत्रसंचालन किया।


## Organisation of World Intellectual Property Day on 26th April, 2023

On World Intellectual Property Day on 26th April, 2023, a programme was organized at ICAR-National Institute of Abiotic Stress Management, Baramati on the theme "Women and IP: accelerating innovation and creativity". The

programme included lectures on basics of IPR, by Dr SS Pawar who gave a comprehensive overview of the IPR act as well as its global and country status; intricacies of patent filing by Dr Neeraj Kumar and a quiz session related to women and IP by Dr Aliza Pradhan. Dr K Sammi Reddy, Director, ICAR-NIASM, in his concluding remarks, highlighted the journey of ICAR in IPR including significance of patents, copyright, genotypes and varieties in ICAR research and discussed potential areas of NIASM research for IPR filing in coming years. The programme concluded with vote of tanks given by Dr AK Singh, member secretary, ITMU. Around 60 participants including scientists, administrative, technical staff, students, and contractual staff attended the programme.

## State Level Workshop on Commercial Dragon Fruit Cultivation

ICAR–NIASM, organized One-Day State Level Workshop on 'Commercial Dragon Fruit Cultivation' in collaboration with SILLC, Pune in partnership with Agrowon and Sakal Media Group on May 20, 2023 at Sakalnagar, Pune. About 35-40 participants including progressive Dragon fruit growers, entrepreneurs, women's and youths and other staff were participated in the event. Mr. Amol Birari, AGM, SILLC briefly introduced the scientists Dr GC Wakchaure, Dr Boraiah KM and Dr Vijaysinha Kakade from ICAR-NIASM, involved in organizing the program. Dr GC Wakchaure, Senior Scientist (AS&PE) highlighted the need of scientific research and policies to enhance the productivity, quality and promote value addition and export of Dragon fruit. Dr Vijay Kakade, Scientist (Fruit science) discussed briefly the soil, planting material, nursery management, pruning, sun burning, irrigation, intercropping, and pest and disease management. Dr Boraiah KM, Scientist (Plant Breeding) briefed about the status and constraints of varietal/hybrid development in India. After technical session, Kisan Ghosti was organized to exchange information and problems faced by farmers in Dragon fruit farming and processing. All participants and SILLC staff appreciated the support of Dr K Sammi Reddy, Director, ICAR-NISAM for organizing the workshop.

## Special lecture on Pension & Retirement Benefits and National Pension System

ICAR-NIASM, organized one special lecture on Pension & Retirement Benefits and National Pension System (NPS) on 26th May, 2023 at the NIASM, Baramati. The event was graced with the presence of Chief Guest Dr Poonam Dhawale, Professor (Finance), SVPM'S Institute of Business Management, Malegaon. Dr SS Pawar, a member of HRD, welcomed the guests and expressed his gratitude towards Dr K Sammi Reddy, Director, who has accentuated the importance of Human Resources in any organization. Dr Aliza Pradhan introduced the speaker before the dignitaries and participants. Dr SK Das, Chief Finance & Accounts Officer, NIASM while delivering the informative lecture differentiated between the old pension system and the national pension system. The Chief Guest emphasized the importance of stage-wise planning for systematic investment to maximize the benefits of savings. The programme was attended by all the Scientific, Technical & Administrative Staff members of NIASM & the Administrative & Finance Personnel of all the Pune based ICAR Institutes. Lastly, Dr Halli, Nodal officer, HRD, expressed gratitude and presented a vote of thanks.


## 12th Institute Management Committee Meeting

12th IMC meeting of ICAR-NIASM was held on May 30, 2023. The meeting was conducted under

IMC Chairman Dr K Sammi Reddy, Director, NIASM. Dr R M Sundaram, Director, IIRR, Hyderabad, Dr Sachine Nalawade, Head, MPKV Rahuri, members of IMC and All Head of School, NIASM attended the meeting physically. Dr S K Das, CFAO, NIASM, Mr Charles Ekka, CAO, NIASM and Member Secretary, IMC and Mr Anirudha Basanth Pujari, Progressive farmers, Solapur member IMC also attended the meeting. Whereas, Dr A Velmurugan, ADG, NRM, Dr J Rane, Director, CIAH, Bikaner, Dr M Prabhakaran, Principal Scientist, CRIDA Hyderabad, Dr S Naresh Kumar, Principal Scientist, IARI, New Delhi, members of IMC attended the meeting through virtual mode. The action taken report on 11th IMC recommendations and Agenda for 12th IMC were presented by Mr Charles Ekka, Member Secretary IMC. The Chairman and members IMC were agreed with the proposed agenda. The Chairman IMC, Dr Reddy was presented the achievements of the institute. The meeting was ended with vote of thanks by Mr Ekka, Member Secretary IMC.

## Celebration of World Environment Day

As a part of awareness of Mission LiFE, ICAR-NIASM organized various events on 5th June 2023 on the occasion of World Environment Day (2023). The programme was inaugurated with planting trees around the ICAR-NIASM playground. Dr MC Varshneya, Former Vice-Chancellor, Anand Agriculture University (AAU), Anand and Kamdhenu University, Gandhinagar and Shri Shripaadrao Nadagonde, General Secretary, Institute of Rural Development were invited as Chief Guest and Guest of Honour, respectively for the programme. Dr K Sammi Reddy, Director, ICAR-NIASM led the plantation of trees along with guests, Heads of schools, and staff of ICAR-NIASM. More than 30 plants of Millettia pinnata were planted around the playground. After the plantation, formal progarmme of World Environment Day was organized in SVP Auditorium. Dr K Sammi Reddy, Director, ICAR-NIASM addressed the gathering and briefly explained about the Mission LiFE and its background along with seven actions to protect the environment and conserve resources. He also urged the gathering to adopt simple and innovative lifestyles for environmental sustainability. Dr MC Varshneya, Chief Guest delivered an invited lecture on climate change and its impact on agriculture. He narrated the different factors that contributed to climate change and its impact on agriculture particularly the shift in the monsoon pattern. The students participated in the short speech competition on topic on "LiFE Mission: Innovative Lifestyles for Environmental Sustainability" and certificates and prizes were distributed to the winners.

## Organization of on-location training program on "Blended Learning Programme (Concept Development, Appraisal and Monitoring) Phase II & III of climate change projects"

ICAR-NIASM in collaboration with Bankers Institute of Rural Development (BIRD), NABARD, Lucknow and National Bank Staff College, NABARD, Lucknow organized an on-location training program on "Blended Learning Programme (Concept Development, Appraisal and Monitoring) Phase II & III of climate change projects" during 12-17 June, 2023 at ICAR-NIASM. The training programme included group activities of participants on development of climate change concept notes appraisal and monitoring including lectures on impacts and management of climate change, abiotic stress adaptation and mitigation strategies developed by ICAR-NIASM *viz.*, new crops (Dragon fruit), sandalwood based agroforestry system, abiotic stress information system portal, greenhouse gas emission monitoring and evaluation strategies, climate smart integrated farming system, field visits to Krishi Vigyan Kendra, ADT, Baramati and Dairy unit. Dr K Sammi Reddy, Director, ICAR-NIASM in his introductory remarks, highlighted several aspects of abiotic stresses, its

management and importance of climate resilient agriculture. Mr Vadivel Esakkimuthu, DGM, NBSC, Lucknow and Mr Sriram Appulingam, DGM, BIRD, Lucknow reiterated the importance of climate change, basic concepts and terminologies, scalability and replicability of climate change project models. Around 16 participants from 15 regional offices of NABARD representing 15 different states of India participated in the training programme.

## Celebration of International Day of YOGA

Various Yoga activities were carried out on the occasion of 9th International Day of Yoga at ICAR-NIASM, Baramati on June 21, 2023. The Yoga Day celebration started with mass participation in YOGA by staffs including Scientists, Technical and Administrative personnel at Amphitheatre at Admin Building of ICAR-NIASM. The I/c Director & Head (SASM), Dr AK Singh introduced about the program with brief information about 'IDY 2023' and its importance in day-to-day life. Dr Pravin Taware, chief Technical Officer demonstrated the various Yoga

practices, asanas, pranayama and dhyan as per the Common Yoga Protocol designed by the Ministry of AYUSH, Govt. of India. A total 39 ICAR-NIASM staff participated in the program with great enthusiasm.

## Visit of Dr A Vishnuvardhan Reddy, Vice-Chancellor of ANGRAU

Dr A Vishnuvardhan Reddy, Vice Chancellor of ANGRAU, Guntur, AP, visited ICAR-NIASM accompanied by several officials from his university. The primary purpose of this visit was to gain insights into activities and facilities, as well as to explore potential collaborations for future endeavours with ICAR-NIASM. During the interaction, Dr Reddy highlighted the importance of partnering with esteemed institutions like ICAR-NIASM to enhance students' research capabilities and provide them with comprehensive knowledge. Additionally, Dr AK Singh, HoS, SASM, shared valuable information with the visiting dignitaries regarding our ongoing research and development initiatives. Following the meeting, a comprehensive tour of the institute's premises was arranged to showcase the various laboratories and facilities across different schools. On the morning of 24th, a field visit was organized, allowing Dr Reddy and his team to witness firsthand the impressive progress made in rehabilitating and revitalizing the lands. The team had the opportunity to explore climate-smart integrated farming systems, silvopasture, the animals experimental farm, and fruit orchards. Dr Reddy expressed his appreciation for the diligent efforts undertaken by institute in the realm of research and development.


## Field day-cum-farmers scientist interaction meet and distribution of items to SC beneficiaries

The field day cum interaction meet was held at Sangavi village to discuss and distribute various need-based items to the Schedule Caste residents on 20th June 2023. The items included sewing machines, kitchen utensils kits, flour mills, bicycles and poultry cages. The meeting was attended by SC beneficiaries, village peoples, grampanchyat sarpanch, other members of grampanchayat, and village representatives. The program began with a warm welcome extended to all the attendees by Dr Vijaysinha Kakade and Pachayat member. The purpose of the meeting was reiterated, emphasizing the distribution of need-based items to improve the quality of life for the SC residents of Sangavi village. The items were distributed to over 100 SC beneficiaries. Dr K Sammi Reddy, Director, ICAR-NIASM, addressed the gathering and highlighted the importance of the DAPSC scheme and distributed items. He

emphasized how the sewing machines could provide opportunities for skill development and income generation for the women in the village. The kitchen utensils were seen as essential tools for maintaining hygiene and efficient cooking practices. The flour mills were distributed to promote self-sufficiency in food processing, ensuring access to freshly ground flour as well as means of earning. The meeting concluded with a call for cooperation and support from the beneficiaries/villagers.

# LIST OF ONGOING PROJECTS

## Umbrella Projects

1. Abiotic Stress Information System (ASIS): Geo-spatial digital maps of multiple abiotic stresses, management options and future scenarios (IXX15659).
2. Germplasm Conservation and Management (GCM): Genetic garden and gene bank for abiotic stress tolerant plants, animals and fisheries for food security and sustainability (IXX15674).
3. Model Green Farm (MGF): Environment-friendly, economically viable, state-ofthe-art model farm for abiotic stressed regions (IXX15700).
4. Climate-smart IFS (CIFS): Climate resilient integrated farming system in semi-arid region (IXX15697).

## Flagship Projects

1. Adaptation and mitigation of atmospheric stress in crops, livestock, poultry and fishes for sustainable productivity and profitability (IXX15676).
2. Augmenting farm income in water scarce regions with alternative crops (IXX15656).
3. Bio-saline Agriculture: Exploitation of halophytic plant and associated microbiome for amelioration of saline agricultural land of arid & semiarid regions (IXX15657).
4. Targeting prospective technologies for abiotic stress resilience in rainfed and dryland region (IXX15699).

## Institute Projects

1. Mitigating water stress effects in vegetable and orchard crops (IXX16553).
2. Assessment and detoxification of heavy metals in aquatic water bodies using nutritional approaches (IXX12494).
3. Nutrient and gene interaction approaches through nutrigenomics in response to multiple stressors (IXX15014).
4. Wastewater treatment synergizing with integrated approach of constructed wetland and aquaponics (IXX14228).
5. Genomics, genetic and molecular approaches to improve water stress tolerance in soybean and wheat (IXX15660).

## External Projects

1. Phenotyping of pulses for enhanced tolerance to drought and heat (OXX01737: Funded by ICAR-NICRA).
2. Conservation agriculture for enhancing resource-use efficiency, environmental quality and productivity of sugarcane cropping system (OXX03355: Funded by ICAR-CRPCA).
3. Evaluation of halotolerant rhizobium and PGPB based biomolecules for alleviation of drought and salt stress (OXX04473: Funded AMAAS, ICAR-NBAIM, Mau)
4. Establishment of model herbal garden for medicinal and aromatic plants (OXX4927: Funded by NMPB, New Delhi).
5. Climate smart management practices (OXX4928: Funded by IRRI).
6. Studies on N-(n-butyl) Thiophosphoric Triamide (NBPT) as a Urease Inhibitor for Improving Nitrogen Use Efficiency in major cropping systems in India (OXX4926: Funded by CIMMYT).
7. Genomics strategies for improvement of yield and seed composition traits under drought stress conditions in soybean (OXX4929: Funded by ICAR-NASF).
8. Development of Nano-based delivery system to mitigates arsenic pollution, ammonia and temperature stress on growth and immune related gene expression in fish (OXX5181: Funded Under LBS Award).
9. Agri Drone Project (OXX5501: Funded by Central Sector Scheme, MoAFW, GOI).
10. Field efficacy of Ortho Silicic Acid (OSA) to alleviate drought stress in wheat crop (OXX5514: Funded by Privi Life Sciences Pvt. Ltd.).

11. Bio-efficacy studies of protein hydrolysate-based bio-stimulant on cotton, soybean, acid lime, chilli, maize and chickpea crops under drought stress condition (OXX5515: Funded by Green star fertilizers Pvt. Ltd.).
12. Efficacy of bio-stimulants in alleviating drought stress in tomato (Solanum lycopersicum L.) (OXX5500: Funded by Yara Fertilisers India Pvt. Ltd.)

**Inter-institutional Project**

1. Evaluation of extrinsic and intrinsic parameters for sustainable breeding and culture of Clarias magur in captivity
2. Soybean intercropping with sugarcane in spring season.
3. Depiction of fennel (Foeniculum vulgare Mill.) mutant lines for higher yield and moisture stress

## SEMINAR/WORKSHOP/SYMPOSIA/TRAININGS ATTENDED

| Name of staff | Title of Seminar/Workshop/ Symposia/Conference/Trainings attended | Venue | Organized by | Dates |
|---|---|---|---|---|
| **Dr Pawar SS** | Workshop 'Genome editing in farm anima--ls for improved productivity & health' | Online | ICAR-NDRI, Karnal | 03 March, 2023 |
| **Dr Gopalakrishnan B** | National Training Workshop on "Big Data Analytics in Agriculture" | ICAR-NAARM, Hyderabad | ICAR-NAARM, Hyderabad | 09-10 March, 2023 |
| **Mr Potekar SV** | Agrometeorological data collection, analysis and management | ICAR-CRIDA, Hyderabad | ICAR-CRIDA, Hyderabad | 18-27 January, 2023 |
| | Small and medium category drone training | MIT, Anna University, Chennai | MIT, Anna University, Chennai | 21 April -01 May, 2023 |
| **Dr Changan SS** | Winter school on "Climate Change & Abiotic Stresses Management Solutions for Enhancing Water Productivity, Production Quality & Doubling Farmers Income in Scarcity Zones" | ICAR-NIASM, Baramati | ICAR-NIASM, Baramati | 05-25 January, 2023. |
| **Dr Pradhan A** | National Conference on Agro-Ecology based Agri-Food Transformation Systems | ICAR-IIFSR, , Meerut | FSRDA and ICAR-IIFSR, Meerut | 27-28 January, 2023. |
| | Online training programme on "Data Visualization using R" | ICAR-NAARM, Hyderabad | ICAR-NAARM, Hyderabad | 01-08 March, 2023 |
| | Training programme on "Multivariate Data Analysis" | ICAR-NAARM, Hyderabad | ICAR-NAARM, Hyderabad | 20-27 March, 2023. |
| **Dr Khapte PS** | Online webinar on "Plant response to abiotic stress" | Online | American Society of Plant Biologist. | 02 February, 2023 |
| | Online training programme on "Data Visualization using R" | ICAR-NAARM, Hyderabad | ICAR-NAARM, Hyderabad | 01-08 March, 2023 |
| **Dr Gurumurthy S** | International Conference on "Pulses: Smart crops for agricultural sustainability and nutritional security" | NASC, New Delhi | Indian Society of Pul--ses Research & Dev-elopment, IIPR, | 10-12 February, 2023 |
| | International Conference on "Biodiversity, Food Security, Sustainability & Climate Change" | Assam Agricultural University, Jorhat | Assam Agricultural University, Jorhat | April 25-28, 2023 |
| | "Advances in Statistical techniques for Efficient Agricultural Experimentation" | ICAR-IASRI, New Delhi | ICAR-IASRI, New Delhi | January 11-31, 2023 |
| **Mr. Kulkarni GV** | Online training Programme on E-Governance Applications in ICAR for Administrative Personnel " | ICAR-IASRI, New Delhi. | ICAR-IASRI, New Delhi. | 06-10 February, 2023 |
| **Mr. Chahande PR** | Online training programme on "Good agricultural Practices (GAPs) for enhancing resource-use efficiency and farm productivity" | ICAR-IARI, New Delhi. | ICAR-IARI, New Delhi | 20 January to 3 February, 2023 |
| **Mr. More Aniket** | Training programme on " Selection, Adjustment, Operation & Maintenance of Agricultural Implements for field and Horticultural Crops" | ICAR-CIAE, Bhopal | ICAR-CIAE, Bhopal | December 29, 2022 to January 07, 2023 |

# PERSONALIA

## Awards / Recognitions

1. ***Dr Nangare DD***

- ICAR-NIASM Best Senior & Principal Scientist award on occasion of 15th foundation day on 21st February, 2023.
- Recognized as External subject expert member for Career Advance scheme (selection committee), Department of Applied Engineering, VIGNAN'S Foundation for Science and Technology, Vadalamudi, Dist: Guntur (AP) on 08.06.2023.

2. ***Dr Chavan SB***

- ISAF Gold Medal 2022 by Indian Society of Agroforestry, ICAR-CAFRI Jhansi in the field of agroforestry.

3. ***Mr R Rajkumar***

- Recognized as "Mentor" in State Inter-University Research Convention for Post Graduate Students level at "AAVISHKAR-2023" under "Agriculture and Animal Husbandry" category held at "Savitribai Phule Pune University", from 12-15 January, 2023.

4. **Dr Gurumurty S**

- Visiting post-doctoral fellowship (3 months) (International Exchange Fellowship) at Kansas State University, Kansas, USA.
- Recognized as University teacher of BSKKV, Dapoli, Maharashtra, UAS, Dharwad, Karnataka, UAS, Raichur, Karnataka; as University faculty and guide of IARI, New Delhi and member of the Board of Studies (BOS), Tuljaram Chaturchand College, Baramati, Pune.

5. ***Dr Basavaraj PS***

- Young Scientist award from Mother Terasa College of Agriculture & All India Agricultural Student Association during International Conference on Climate Resilient Agriculture for Sustainable Agricultural Productivity on 31.03.2023.

## Joinings

Dr Sushil Sudhakar Changan joined ICAR-NIASM on 06.03.2023 after transfer from ICAR-CPRI Shimla

Dr Nobin Chandra Paul joined ICAR-NIASM on 11.04.2023

Dr Amrut Sanjay Morade joined ICAR-NIASM on 06.03.2023 after transfer from ICAR-IISWC Bellary

## Selections

Dr Jagadish Rane joined as Director ICAR-CIAH Bikaner on 22.01.2023

## A GPT's poem on Millets

---

Amidst India's landscapes vast and wide,
Where diversity and beauty coincide,
Millets rise in fields of golden hue,
A testament to a heritage true.

From the Himalayan peaks so high,
To the shores where oceans kiss the sky,
Millets thrive in every nook and bend,
A legacy on which many depend.

In Rajasthan's deserts, they take their stand,
Pearl millet's grace upon the sand,
And in Karnataka's heartland fair,
Finger millet's strength fills the air.

From Bajra rotis to Ragi's embrace,
Millets bring to India a wholesome grace,
A bounty from earth, a nourishing feast,
In every grain, a story released.

In dals, dosas, and pinnis sweet,
Millets dance on taste buds, a treat,
A gastronomic journey through India's soul,
Millets' presence makes the flavours whole.

So let's celebrate these grains with pride,
In India's heart, they firmly reside,
A symphony of sustenance and grace,
Millets woven into India's embrace.

---

In Maharashtra's embrace, a wondrous sight,
Millets bloom with all their might,
Fields of bounty, a patchwork quilt,
Where NIASM's wisdom & knowledge are built.

NIASM, a beacon of learning's light,
Hosts a seminar, a gathering bright,
A symposium grand on millets' grace,
Bringing experts together to embrace.

From far and wide, minds convene,
Sharing insights, visions keen,
In the heart of India, this land so vast,
Millets' importance, a clarion blast.

Maharashtra's soil, a nurturing bed,
Where millets flourish, their story spread,
NIASM's halls echo with wisdom's call,
Millets' revival celebrated by all.

A nation's heritage, a treasure untold,
Millets' worth is more than gold,
In Maharashtra's arms, they find their place,
At NIASM's seminar, they leave a trace.

So let's salute this endeavour grand,
Millets' revival, a reclamation of land,
In Maharashtra's heart, NIASM's abode,
Millets' story and knowledge bestowed.

---

(Poem generated using ChatGPT 3.5, OpenAI, https://chat.openai.com by Dr BB Gaikwad)

हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agrisearch with a human touch