



FARM COORDINATOR

... कृषि तकनीकी समन्वय पत्र

भाकृअनुप – राष्ट्रीय अजैविक स्ट्रेस प्रबंधन संस्थान

ICAR-NATIONAL INSTITUTE OF ABIOTIC STRESS MANAGEMENT

बारामती, पुणे - 413 115, महाराष्ट्र, भारत

Baramati, Pune – 413 115, Maharashtra, India

Published by

Dr. Himanshu Pathak

Director

ICAR- National Institute of Abiotic Stress Management,
Baramati, Pune- 413115, Maharashtra

Contributors

Dr. Pravin Bhimdeo Taware, Asst. Chief Technical Officer & Farm Manager

Mr. Rushikesh Shivaji Gophane, Technical Officer (Hort)

Mr. Patwaru Ranbhid Chahande, Senior Technical Assistant (Agril)

Mr. Sunil Vishnu Potekar, Senior Technical Assistant (Agro.Met.)

Mr. Aniket Tukaram More, Technical Assistant (Farm)

Mr. Pravin Hari More, Technical Officer (Computer)

Compiled and edited by

Dr. Pravin Bhimdeo Taware, Asst. Chief Technical Officer & Farm Manager

Contact Details

Director

ICAR- National Institute of Abiotic Stress Management,
Baramati, Pune- 413115, Maharashtra

Phone: 02112-254055/57/58, Fax: 02112-254056

Email- director.niasm@icar.gov.in

Website- www.niam.res.in



Page No.

Contents

1

निदेशक की लेखनी से / From the Director's Desk

2

Achievements of December 2021

3

Weather Summary

4

Targets for January 2022

5

Challenges Ahead

6

Technical Basics

7

Glimpses of the Month

8

प्रगति के पथ पर / Plan for Progress

निदेशक के लेखनी से...

अरब सागर में कम दबाव के क्षेत्र के कारण चक्रवाती परिस्थितियों के बीच दिसंबर के महीने में बेमौसम बारिश हुई। दिसंबर के लंबी अवधि के औसत की 5.7 मिमी की पृष्ठभूमि पर पहले सप्ताह में परिसर में 56 मिमी वर्षा दर्ज की गई। इससे रबी के मौसम की गतिविधियों में गड़बड़ी के अलावा फसलों में विशेष रूप से बगीचों में बीमारी का खतरा बढ़ गया। इसके अलावा, ऐसी परिस्थितियों में भी राष्ट्रीय सम्मेलन के दौरान नियासम परिसर के ऐतिहासिक स्वच्छता को प्रदर्शित करना फार्म अनुभाग के लिए एक चुनौतीपूर्ण कार्य था। निर्धारित समय में कार्य को प्राप्त करने के लिए युद्धस्तर पर किए गए प्रयासों के लिए पूरे कृषि कर्मचारियों और श्रमिकों को मैं बधाई देता हूँ।

इस महीने, प्रक्षेत्र कर्मचारी रबी फसलों की बुवाई में व्यस्त थे, जो इस महीने की शुरुआत में पूरी हुई। बरसात के दिनों के बाद कृषि रसायनों के छिड़काव के माध्यम से बागों में रोगजनक भार को कम करने के लिए तत्काल कार्रवाई की गई। यह पत्र कैम्पस में लैंडस्केप गार्डनिंग पर फोकस कर रहा है। जैसा कि तकनीकी बुनियादी बातों में उल्लेख किया गया है, लैंडस्केप बागवानी सभी प्रयासों का महत्वपूर्ण हिस्सा है, जिसे नवीन रूप से देखा जा रहा है। 'मलद फार्म' की गतिविधियाँ सकायात्मक रास्ते पर हैं और खेत को मुख्य रूप से शुष्क भूमि कृषि अनुसंधान के लिए तैयार किया जा रहा है। हालांकि, इन विकासों की गति को बढ़ाने की जरूरत है। यह उल्लेखनीय है कि निर्धारित लक्ष्यों को ईमानदारी से पूरा किया जा रहा है और मुझे आशा है कि कृषि कर्मचारी निरंतर सुधार के लिए 'कायज़ेन' सिद्धांतों का पालन करेंगे।

मैं डॉ. प्रवीण तावरे के नेतृत्व में प्रक्षेत्र अनुभाग की पूरी टीम को फार्म संचालन की समयबद्ध, विशिष्ट और आवश्यक गतिविधियों को पूरा करने के लिए धन्यवाद देता हूँ। इस महत्वपूर्ण प्रकाशन को नियमित रूप से और इतने सुंदर ढंग से प्रकाशित करने के लिए मैं उनका विशेष धन्यवाद करता हूँ। मुझे विश्वास है कि वे आने वाले दिनों में खेत के प्रबंधन में नए नवाचार लाएंगे। मैं उन सभी को नव वर्ष की बहुत-बहुत शुभकामनाएं देता हूँ।

From Director's Desk...

The month of December exhibited unseasonal rains amid cyclonic conditions due to low-pressure area in the Arabian Sea. At campus 56 mm rainfall was recorded in 1st week on the background of 5.7mm long period average of December. It caused disturbance in *Rabi* season activities besides increasing disease risk in crops especially orchards. Further, under such conditions, displaying aesthetic history of NIASM campus during National Conference was a challenging task for the Farm Section. I congratulate the whole farm staff and workers for their actions on war-foot to achieve the task in scheduled time.

This month farm staff were busy in *Rabi* crops' sowing, which was completed early this month. Immediate action for reducing pathogen load in orchards was undertaken through spraying of agrochemicals after rainy days. The work also included timely horticultural practices. This issue is focusing on landscape gardening at the campus. As mentioned in technical basics, landscape gardening is the aesthetic part of all efforts, which is being looked after innovatively. The activities at 'Malad Farm' are on positive track and the farm is made ready primarily for dry-land agriculture research. However, there is need to increase the pace of these developments. It is remarkable that the targets fixed are being accomplished sincerely and I hope the farm staff will follow 'Kaizen' principles for continuous improvements.

I thank the whole team of the Farm Section led by Dr. Pravin B Taware for accomplishing the time-bound, specific and essential activities of farm operation. My special thanks are for them for bringing out this important publication very regularly and so elegantly. I am sure, they will bring new innovations in managing the farm in the coming days. I wish all of them a very happy New Year..




Maintenance of *rabi* crops: Sowing of *rabi* crops in experimental fields was completed till 10th of December. However, few 'sowing date treatments' were continued to meet research requirements. Important crops standing in field during this period were Sugarcane, wheat, chickpea, pigeon pea, sunflower, quinoa, chia, chilli, brinjal, tomato and fodder crops like maize, lucern, napier and Luecaena. Weeding, fertilizer top dressing followed by irrigation at critical stages were taken care of on demand. Maintenance at tamarind x sandalwood x lemongrass was also carried out in the form of weeding and irrigation.

Orchard management: During unseasonal showers in the first week grape orchards were at early flowering stage. The rain water collected in the flower was supposed to cause rotting and by increasing risk of downy mildew infection. Therefore a care was taken to minimize the damage by spraying Pyraclostrobin before and after the showers. Bunch dipping after berry set @ 40ppm followed by 50ppm was carried out for increasing berry size by elongation. Though due to rains during flowering there was some berry drop, selective manual berry thinning required to get loose bunches. In dragon fruit orchard, shoot thinning and pruning of unwanted branches was continued to facilitate canopy management experiments for next season. The pruned cuttings were used in nursery for generating planting material. Plant protection and nutrition management was done by following the recommended schedules. Initiated moisture stress in Sweet orange in view of bahar treatment. Other plant protection activities included spraying to control insect pests in pomegranate, sweet orange, sapota, guava, and mango. Sprays to induce flowering in mango were carried out after rains. Farm yard manure application, soil fertilization was carried out by loosening of soil in the basins of fruit trees. Application of water soluble fertilizers through drip and foliar spraying of nutrients was performed to meet immediate crop requirements.

Malad farm activities: *Rabi* sown chickpea performance was good under rainfed conditions. The unseasonal showers helped for better crop growth but increased load of weeds all around. Manual weeding operation was carried out to make the fields clean and



Chickpea- general field on drip irrigation



Wheat- crop for herbicide treatments



Grape- spraying with blower system

conserve soil moisture. Unsown fields cleaning and tillage operations were continued to keep weeds under control. Removal of *Prosopis* bushes from around the fields, roads and boundaries was continued. Drilling pits for boundary side plantation and fence post installation was carried out with the help of post-hole digger.

Campus cleaning & landscape maintenance: In the wake of National Physiology Conference, campus cleaning and landscape maintenance activities were intensified by integrated management practices. Use of machinery, manual weeding, herbicide spraying were practiced to bring the campus in good shape after post- monsoon showers. Manure and fertilizer application for peripheral plantations was given. Internal pathways preparation in Naxatra Udyan was planned during 2nd fortnight. The stones laid along the farm roads were collected for filling the pathway base.

The long period average (LPA) rainfall and average temperature of December, 2021 at Baramati is 5.7 mm and 21.9 °C, respectively. The details of weather during the December 2021 has been listed in Table 1 and depicted in Fig. 1.

Table 1. Summary of weather variables recorded during December, 2021.

Weather Parameters	Week				Monthly	Max.	Min.
	1 st	2 nd	3 rd	4 th			
T Max (°C)	26.8	28.6	27.3	29.5	28.1	30.7	25.5
T Min (°C)	16.7	15.7	13.6	13.3	14.8	18.7	11.1
T Avg (°C)	21.7	22.2	20.5	21.4	21.5	23.0	18.8
RH Mean (%)	83	67	68	66	71	97	63
WS (km/h)	4.1	4.1	4.1	3.0	4.0	7.4	2.2
BSS (h)	2.1	2.0	4.3	3.7	3.2	7.7	0.0
Total PE (mm)	10.8	21.4	21.6	20.8	84.6	3.6	0.0
Total Rain (mm)	56.0	0.0	0.0	0.0	56.0	50.8	0.0

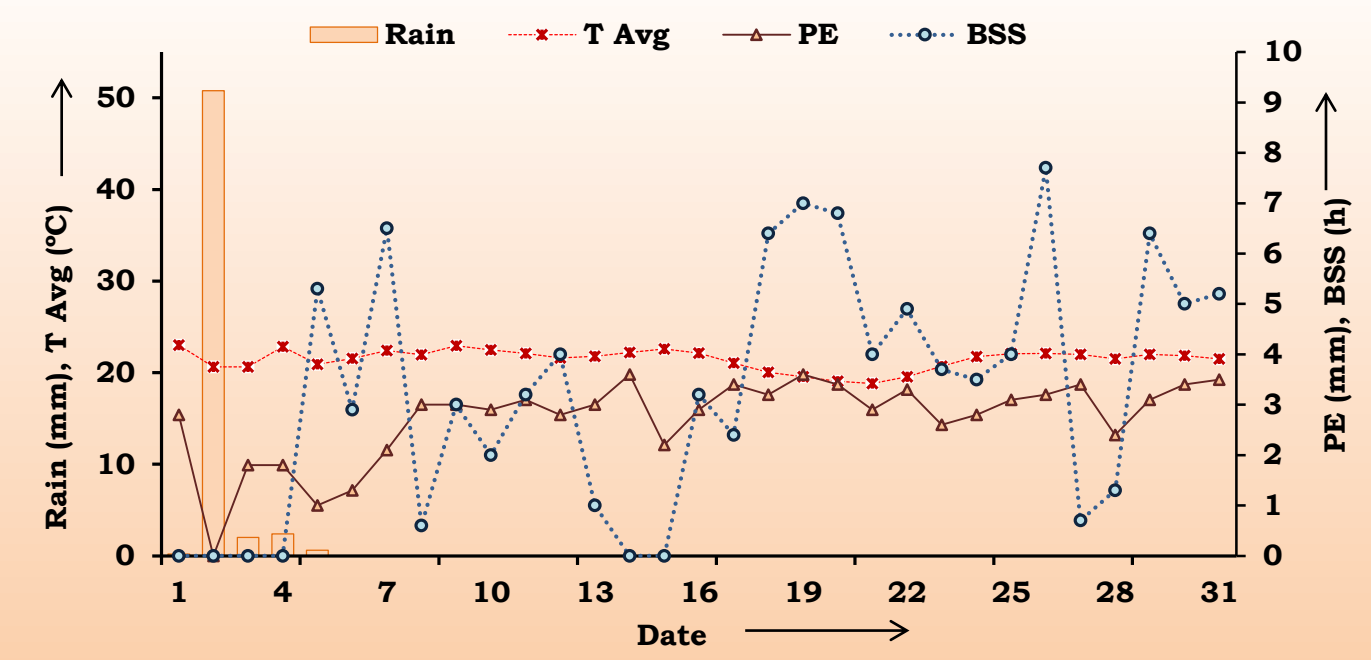


Fig 1. Variations of daily rainfall (Rain), pan evaporation (PE), mean temperature (T_{Avg}) and bright sunshine hours (BSS) during November, 2021 at ICAR-NIASM Baramati.



Mango- flowering initiation



Sapota- fruit development

Rabi crops' maintenance: Maintenance of Rabi crops will be given priority for weed management, irrigation and plant protection as per the requisitions from project leaders. During field tillage few boulders rising to the surface create hinderance during machinery operations. Therefore, collection of these pebbles has been targeted. This will ease the manual weeding operation.

Orchard management practices: Moisture stress is being imposed in sweet-orange as a part of *bahar* management. FYM and fertilizer application will be done during this period and light pruning will be carried out by skirting, opening up and removal of diseased branches. Pomegranate, sapota and grape orchards are in fruiting stage and flowering in mango has been initiated. Due care of these orchards will be taken up for canopy management, nutrition, plant protection and irrigation. Removal of sucker shoots in date-palm is planned during this dormant phase and frequent de-suckering in pomegranate is on priority list. Preparations for early fruiting in dragon fruit are in focus for which electric connections for light source are to be installed so that light treatment can be imposed from mid-February.

Malad farm activities: Chickpea sown in three fields is performing well but there is weed load due to rains during the first week of December. Manual weeding has been started already and will be continued to make whole farm weed-free. Drilling for roadside plantation and fence post installation are prepared and the work of fixing fence line partially will be completed. The *Prosopis* shrubs are also being removed and those will be disposed of by burning.

Plant protection: Powdery mildew and fungal blight are prominent diseases reported during this period. Spraying of chemicals like Wettable sulphur, Dinocap, Penconazole, Myclobutanil, etc. will be taken up to control the infections. Insect pest is a big issue at campus for all the field crops, vegetables and orchards. List of recommended pesticides have been prepared and efforts will be made to procure and use the same at the earliest. To cure various nutrient deficiencies foliar application of soluble nutrients and micronutrient mixtures will be carried out at frequent intervals. Use of stick traps will be started as soon as the temperature starts rising from mid-January.



Pigeon pea- ready to harvest



Sugarcane- chickpea intercrop



Brinjal- vegetable research field



Dragon fruit- pruning for canopy mgmt.



Integrated weed management

Effect of Cyclonic Disturbances on Grape

As discussed in previous issue, the cyclonic disturbances at Bay of Bengal and Arabian Sea, are badly influencing Indian agriculture every year. Particularly the showers during October to December months have detrimental effect on orchards by directly interfering the horticultural practices or indirectly due to triggered disease load. In grapes, the stages after forward pruning are very critical and any such adversity causes heavy loss to the crop in terms of quality and quantity. Farmers make efforts to escape such situations by advancing or delaying pruning. However, year after year occurrence of cyclone showers is very frequent. This year the unseasonal showers during the first week of December, the early pruned as well as late pruned vineyards were badly affected. As in the images, the late pruned vineyards were at flowering stage where the flowering bunches were rotted due to downy mildew infection and berry drop was observed to record the losses of more than 50%. While the early pruned vineyards were at maturity stage and the berry cracking and rotting of bunches was reported in these to the extent of 60-80%. Damage at this stage leads to complete loss as all the expenditure incurred during whole year goes in vain.



Damage at flowering stage



At flowering stage the floral parts being hygroscopic, accumulate the moisture in bunch. Due to this, risk of downy mildew infection increases and it spreads very fast. The infection of peduncle causes sudden berry drop while the infection of rachis causes berry drop after full setting at 4-6 mm berry size. The rachis infection also causes mummification of berries at the time of maturity, as the conducting vessels are clogged due to the infection. During visit to various farms it was noticed that all the late pruned orchards i.e. forward pruned 40-60 days before evidence of untimely rains due to cyclone effect, were badly affected. These exhibited heavy losses due to bunch rotting and berry drop.



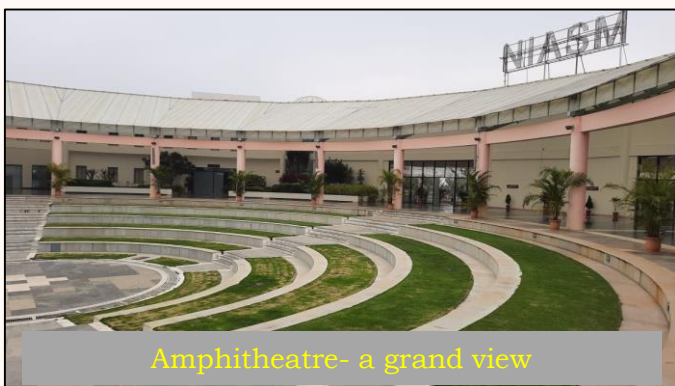
Damage at maturity stage



At maturity stage i.e. after veraison stage, sugar accumulation in berries starts. If berries become wet due to rains during this period, the moisture gets absorbed inside the berry through osmosis. The turgor pressure of berries increases and berry cracking is observed. Development of moulds and maggots in cracked berries causes rotting of berries. On visit to the vineyards pruned early and were near harvesting during this cyclonic effect, the berry cracking and rotting was reports. The damage was up to 85-100%. The damage was exaggerated due to development of maggots in cracked berries. The unaffected bunches were also get damaged subsequently by flies losing its economic value.

Landscape Gardening Activities at Campus

ICAR-NIASM campus is not less than a 'Biodiversity Park'. For research purpose various seasonal and perennial crops are grown along with 20 type of orchards. The landscape garden of the campus makes big contribution to this biodiversity. Various foliage as well as flowering trees and shrubs are being grown in very planned manner. Lawns, flower beds, hedges, edges, etc. are included in the garden. Separate theme parks are developed starting from main entry gate, different structures, water tanks, peripheral and internal roads. 'Naxatra Udyan' established near admin building is one of these efforts that brings cosmic energy for developing work-culture amongst all the NIASM associates.



Amphitheatre- a grand view



Admin building- indoor shrubbery



Bird of Paradise- part of indoor flowers



Gladiolus- from waste water mgmt. project



Chrysanthemum- nursery near farm office



Aster- flowers from triangle garden



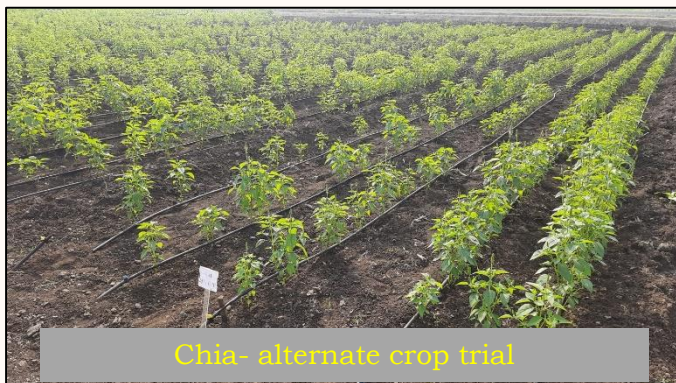
Plumeria- flowers at guest house garden



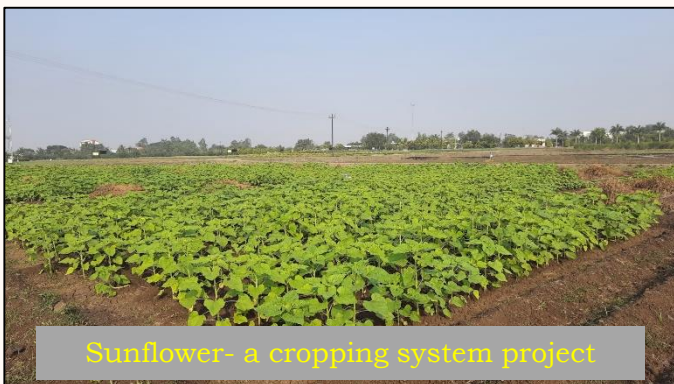
Oleander- flowering shrubs along periphery



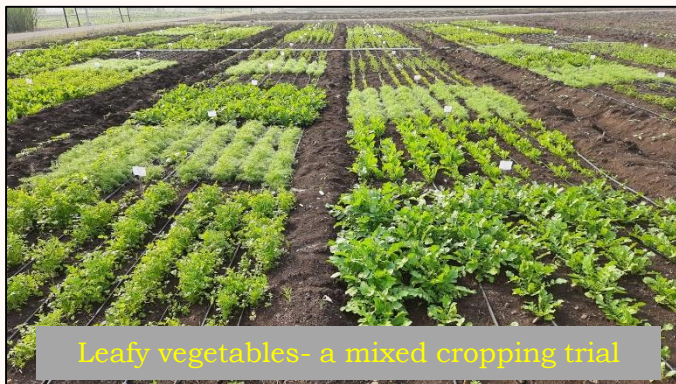
Quinoa- different sowing date trial



Chia- alternate crop trial



Sunflower- a cropping system project



Leafy vegetables- a mixed cropping trial



Sugarcane- plant nutrition project



Chickpea- crop at Malad Farm



Grape- improvement in fruiting



Jack fruit- good fruiting



Sanjeevani Udyan- a medicinal garden



Dragon fruit- new orchard developments

प्रगति के पथ पर

भाकृअनुप- नियासम परिसर की लैंडस्केप गार्डन विशेष रूप से फूलों की झाड़ियाँ और पेड़ इस समन्वयन पत्र का केंद्रीय मुद्दा हैं। परिसर में लगभग 200 से अधिक प्रजातियों का प्रतिनिधित्व करते 12000 पौधे लगाए गए हैं। इन पौधों को परिसर में अनुसंधान और सामान्य सौंदर्य उद्देश्य के लिए उगाया जा रहा है, जो परिसर को 'जैव विविधता पार्क' की पहचान देता है। ठंड के मौसम में विभिन्न प्रजातियों में सक्रियता से फूल खिलते हैं, मानो जैसे ये फूल साल भर के प्रयासों की उपलब्धियों का जश्न मना रहे हों। यह नयी योजना के रूप में नवीन विचारों के साथ प्रगति के पथ पर की आगे बढ़ने के लिए रंगीन और सुगंधित ऊर्जा देते हैं। सपनों से पेर मील के पत्थर तक पहुंचने के लिए सुधार के लिए क्रमिक लेकिन लगातार प्रयास आवश्यक हैं। लक्ष्यों और उपलब्धियों के ऐसे निरंतर प्रयासों और प्रलेखन के साथ, मॉडल कृषि विकास गतिविधियों में बहुत सुधार का अनुभव किया जा रहा है। कई प्रेरक नेताओं ने दोहराया है कि प्रगति के लिए योजनाओं को लिखना चाहिए और उस पर बहुत ईमानदारी से नजर रखनी चाहिए।

अनुसंधान फार्म प्रबंधन गतिविधियों में फसल की खेती के तरीके, सिंचाई और खरपतवार प्रबंधन, पोषण प्रबंधन, पौधों की सुरक्षा और कटाई के बाद के तरीके शामिल हैं। इन सभी गतिविधियों को इसके उद्देश्यों और प्रक्रियाओं को निर्दिष्ट करते हुए विभिन्न शीर्षों में विभाजित करने की आवश्यकता है, जो इसके कार्यान्वयन को आसान और परिपूर्ण बनाती है। क्योंकि, कृषि प्रबंधन दोनों अन्योन्याश्रित कारकों पर निर्भर करता है; जैसे जानकारी और कार्यान्वयन। 'फार्म समन्वयक' की शुरुआत से, प्रयासों, प्रदर्शन और अंतिम परिणाम के साथ-साथ स्व-लेखापरीक्षा करना आसान और अनिवार्य हो गया है। इसलिए, प्राथमिकता सूक्ष्म गतिविधियों की योजना और कार्यान्वयन को नवाचारों के प्रति अधिक पारदर्शी और लचीला बनाना है। नए साल का स्वागत नई महत्वाकांक्षाओं के साथ करते हुए अधिक उत्साह और पहल के साथ निरंतर आगे बढ़ते रहें। नियासम प्रक्षेत्र को 'मॉडल रिसर्च फार्म' बनाना प्रगति का असली पथ है।

Plan For Progress

Landscape garden especially the flowering shrubs and trees at ICAR-NIASM campus are in the focus of this issue. About 12000 plants at the campus represent more than 200 species. These plants are being grown at the campus for research and general aesthetic purpose that makes the campus a sort of 'Biodiversity Park'. The cold season activates bloom in various species as if these flowers are celebrating the achievements of year-round efforts. This gives colourful and fragrant energy to go ahead with innovative ideas as a plan for progress. Gradual but persistent efforts for improvement are necessary to reach the milestones beyond the dreams. With such continuous efforts and documentation of the targets and achievements, lot of improvement in model farm development activities are being experienced. Number of motivational leaders have reiterated that for progress one must chalk down the plans and to keep eye on it very sincerely.

The Research Farm Management activities include crop cultivation practices, irrigation and weed management, nutrition management, plant protection and post-harvest practices. All these activities need to be subdivided in to different heads specifying its objectives and procedures which makes its implementation easy and perfect. Because, farm management depends on both the interdependent factors; the knowhow and implementation. Since the initiation of 'Farm Coordinator', it has become easy and mandatory to self-audit the efforts, performance and the ultimate result as well. Therefore, priority is to make the planning and implementation of micro-activities more transparent and flexible towards the innovations. While welcoming the New Year with new ambitions, let's move ahead persistently with more enthusiasm and initiatives. Making NIASM farm a Model Research Farm is the ultimate plan for progress.

