



अजैविक स्ट्रेस प्रबंधन समाचार Abiotic Stress Management News

भाकृअनुप-राष्ट्रीय अजैविक स्ट्रेस प्रबंधन संस्थान
(समतुल्य विश्वविद्यालय)

मालेगाँव खुर्द, बारामती - 413 115, पुणे, महाराष्ट्र, भारत

ICAR- National Institute of Abiotic Stress Management
(Deemed to be University)

Malegaon Kh., Baramati - 413 115, Pune, Maharashtra, India



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Editorial committee

Dr. D. P. Patel
Dr. M. P. Brahmane
Dr. Ajay Kumar Singh
Dr. Sachinkumar S. Pawar
Dr. Neeraj Kumar
Mr. B. Gopalakrishnan
Mr. A. Balusamy

Compilation & Technical Assistance

Mr. Praveen More
Mr. Madhukar Gubbala

From the Director's Desk.....

Greetings from ICAR-NIASM.

Food security of the ever increasing population is being challenged by climate change. Country expects that the agricultural scientists should find out innovative solutions to abiotic stresses that are likely to occur more frequently and with higher magnitude. Considering these challenges, ICAR-NIASM has started basic and strategic research with interdisciplinary approaches that integrates and coordinates research on biotechnology, genetics, physiology, breeding, agronomy, cropping systems, horticulture, livestock and fisheries.

As Director of this new and unique Institute, there are many challenges and responsibilities to create the best working atmosphere and research facilities so that working potential of existing young staff can be fully utilised. Institute witnessed many important and significant events during the last six months. I am thankful to Dr. Jagdish Rane, Head, SDSM, the Acting Director (till 11th September 2016), who further lead the development activities of the institute.

Institute Technology Management Unit initiated registration process for institute logo as Trademark for product and services of the institute. This will help in maintaining the quality of product and increased visibility of the institute technology among various stake holders in addition to Intellectual Property Right (IPR).

In addition to involvement in mandated research and institute development activities, the staff of institute actively participated in many events such as International Yoga Day on 21st June 2016, Hindi Chetana Mas during 01-30th September 2016, Hindi Diwas on 14th September 2016 and Swachhta Abhiyan on every Wednesday during entire period.

Mera Gaon Mera Gaurav (MGMG) programme is gaining momentum and our scientists are providing the requisite advice to the farmers of the adopted villages.

Highly favourable monsoon allowed timely planting of all the field experiments. As the monsoon was as per prediction to be normal, I hope and wish that most of the farmers harvest good crop this year.

I thank the editorial team lead by Dr. D.P. Patel who has made tremendous efforts to include key highlights of the institute in this issue of the Newsletter. I also place on record my thanks to all the staff members who have contributed to this newsletter. I extend my sincere thanks to Dr. T. Mohapatra, Secretary, DARE and DG, ICAR, and DDG (NRM), ICAR for their continued support to ICAR-NIASM. I am very much confident that the first issue of Newsletter would be received well by readers across different domains.

(Narendra Pratap Singh)



Quantifying CO₂ and heat fluxes from crop ecosystems using Eddy Covariance method

One of the main objective of the institute is to carry out basic and strategic research on climate change. To achieve higher accuracy in climate prediction, modelers require reliable information on land surface parameters such as sensible heat flux (energy that is emitted from soil and heats up the overlying atmosphere), latent heat flux (energy consumed in the process of evapo-transpiration) and greenhouse gas (GHG) fluxes over different crop surfaces across climatic zones.



Monitoring of fluxes and biophysical parameters of crop ecosystems

Flux data processing protocols have been standardized and information generated on various flux dynamics. In chickpea, mean diurnal sensible heat flux rates during the initial, crop development, mid-season and late season stages were 33.4, 23.0, 23.2 and 52.3 Wm⁻², respectively. Variability in sensible heat fluxes could be explained to the tune of 60-65% using either

remotely derived Enhanced Vegetation Index or Canopy Air Temperature Difference.

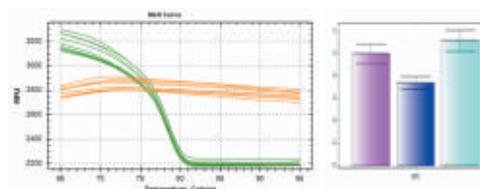
In case of CO₂, it has been found that for dhaincha (green manure), wheat and soybean crops, the seasonal mean of day time net flux rates varied between -5.2 to -7.6 μmoles m⁻²s⁻¹ (negative sign indicating net uptake by crop ecosystem) and that of night time rates ranged between 3.1 to 4.6 μmoles m⁻²s⁻¹ (positive sign indicating net emission).

Gene expression and HSP polymorphism in poultry under heat stress

Heat stress is considered to be one of the major concerns in poultry industry. Understanding the genetic basis of thermo-tolerance is crucial for successful poultry production and welfare. In the present study, a batch of commercial layer birds was reared under summer heat stress for a period of three weeks. The birds were under moderate to severe heat stress during the entire experimental period. The amplification of HSP gene polymorphic regions i.e., *HSP70* promoter region (364 bp) and 3' Untranslated region (434 bp) was achieved. Also, gene expression analysis was performed for *HSP70* gene in the poultry birds under heat stress.



Experimental birds reared under summer heat stress



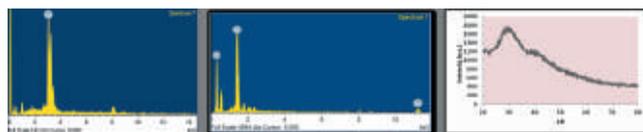
HSP70 expression in heat stressed poultry birds

Synthesis of nanostructured materials using fisheries waste

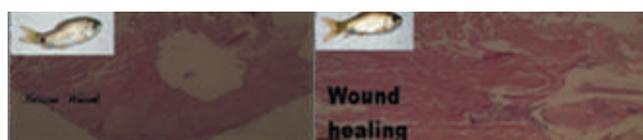
Synthesis of nanoparticles is an important component of the rapidly growing research efforts in nanoscience and nanoengineering. One step process has been developed for the synthesis of silver, zinc and selenium nanoparticles using fisheries wastes and a patent application has been filed. The nanostructured materials have been characterized by SEM-EDAX, TEM and XRD. This invention further relates to application of such synthesized bactericidal nanoparticles for controlling fish pathogens such as *Aeromonas hydrophila* in aquaculture.



Nanostructured materials



Characterization of nanostructured materials

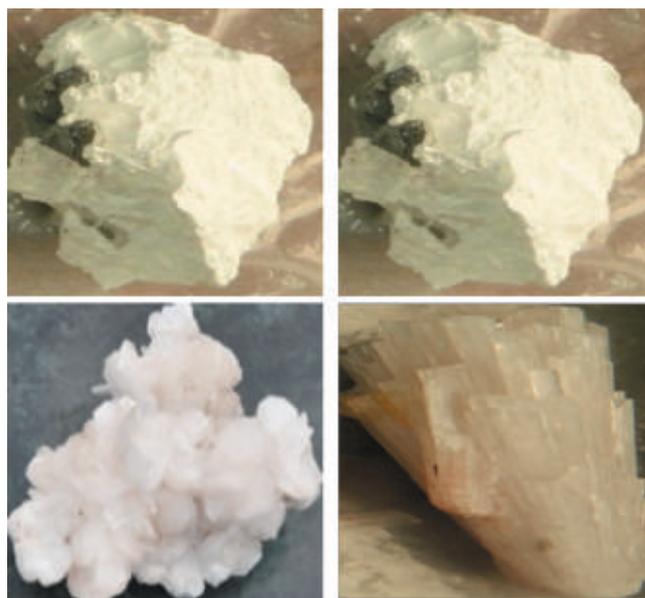


Ag NPs in feed as wound healing agent in fish

Aluminosilicates-based nanocomposite for alleviation of multiple stressors

Novel nanoparticles and its role in environmental remediation is the subject of extensive research. Nanomaterials have increasingly been used in water treatment because of economical and environmental viability and wider availability. Abundantly available zeolites in quarries of Maharashtra and modifications of the surface and pores of zeolites make them

attractive candidates for various applications. Thirteen different forms of zeolites such as Mesolite, Thauamarite, Okenite, Mordanite, Prehnite, Thomsonite, Gyrolite, Scolerite, Stilbite, Heulandite, Stellerite, Apophyllite and Ferrerite were subjected to trapping of silver nanoparticles and native zeolites and zeolites trapped with silver nanoparticles were characterized by ICP-MS, which indicated the trapping of silver nanoparticles in zeolites. This has potential application in alleviation of multiple stressors in aquaculture system viz., ammonia removal and bactericidal activity.



Different forms of zeolites



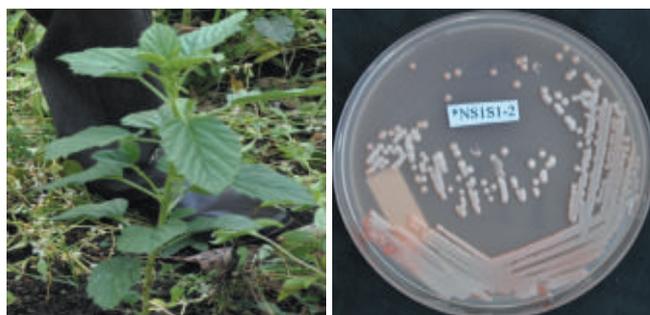
Bactericidal activity

Research Highlights

Microbially derived polymeric product for gel formation and metals binding developed

The present invention relates to the development of low cost microbially derived polymeric product. The said product has considerably high binding capacity with monovalent and bivalent cations due to the presence of multiple functional groups. The product serves as an immobilizing matrix through the formation of biofilm and nurturing root microbial colonization as it has high surface area and longer retention time and protection from inhibitory compounds for maintenance of high microbial cell density and optimization of microbial growth. The product acts as a good gelling agent due to its water holding capacity. It has an application in gel formation for slow delivery, microbial colonization through biofilm formation and the binding of toxic heavy metals and other metallic cations including alkali and alkaline earth metals. A patent application has been filed for this investigation.

Microbially derived polymeric product



Terrestrial weed endophytic halotolerant bacteria



Bacterially derived polymer

Influence of application of chemicals on onion recovery under varying duration of waterlogging

An experiment was conducted to study the impact of duration of waterlogging on physiological manifestation and yield of late *kharif* growing onion var. Bhima Shakti. Six different flooding duration viz., 0, 2, 4, and 6 days were imposed at 15 days after transplanting of onion. Soil and foliar application of chemicals were tried. The results indicated that under normal condition additional nutrient application has significant effect in increasing bulb weight and over all yields irrespective of mode of application over control. Waterlogging up to 2 days did not have much influence on decreasing the yield of the plant. The plants recovered well with the applied nutrients. However, the effect was predominant with foliar application of KNO_3 and spermidine.

Waterlogging beyond four days drastically reduced the yield. The plant recovery after six days of ponding seems minimal. Nonetheless, with the application of chemicals, the yield improved at least 10-15%. Thick neck bulb occurrence was more as the days of water ponding increased. This was significantly reduced with foliar and soil application of chemicals. The improvement was much better with foliar application of KNO_3 , spermidine and thiourea whereas sulphur and K application along with humic acid through soil performed better than Nitrogen (N) application. Soil application of N negatively influenced some of the quality and bulb parameters. Sporadic flowering and thick neck bulb percentage was increased. TSS content decreased with the increase in waterlogging. This ultimately decreased the pungency of the bulb which was reflected through decrease in pyruvic acid content. However, this could be negated with the foliar application of KNO_3 .

Improving nitrogen-use efficiency in sugarcane through fertilizer application methods under surface retention of trash

The colossal amount of trash (10-20 t/ha) generated after sugarcane harvest hampers particularly fertilizer placement, therefore open-burning is a common practice in ratoon sugarcane. To address these issues for low yields of ratoon sugarcane, a stubble shaver, off bar cum fertilizer applicator developed by IISR, Lucknow was further upgraded at NIASM with inclusion of larger capacity fertilizer box, robust power transmission and root pruning mechanisms. Performance of this multi-purpose machine popularly known as "SORF" (stubble shaver, off-bar, Root pruner cum fertilizer drill) machine was demonstrated and evaluated with ten on-farm trials.



Demonstration of SORF machine

Surface retention of chopped trash and band placement of either recommended or double the dose of N as basal rather than recommended two splits as basal and at earthing-up improved the cane yields and nitrogen uptake efficiency on an average by 16-22% and 9-11%, respectively over farmer's practices of trash burning and broadcasting of fertilizers which led to increase in net profit of farmers by Rs. 27-50 thousand/ha.

Prototype of multi-purpose machine for sugarcane ratoon crop

Efforts have been made to develop a multi-purpose machine for trash chopping, off barring, root pruning, application of fertilizers and sowing of intercrops in sugarcane ratoon crop in a single run. The fine tuning of this prototype will offer an environmental friendly and practical solution to trash burning problem in sugarcane cultivation.



Multi-purpose machine

Research Highlights

Bio-regulator as an option for recovery of hail damaged crops

Spraying of Bavistin + Copper oxychloride mixture @ 2 g/litre on sugarcane crop resulted in good recovery of crop from the injury caused by the hailstorm incidence happened at 60 days after planting. Moreover, application of additional 50 kg N/ha just after the incidence along with either spraying of KNO₃ (1.5%) or drenching of N (1.0%) and P₂O₅ + K₂O (2.0% each) further boosted crop growth and increased the cane yield considerably.



Sugarcane crop on the day of hailstorm event



Sugarcane crop 180 days after the hailstorm event

Phenomics platform established

A high-throughput plant phenomics facility has been established at the institute under NICRA. The facility will enable screening of large numbers

of plants from mapping, germplasm collection breeding and mutant populations for different stresses such as drought, salinity and high temperature. It will allow the application of experimental treatments such as water and nutrient stresses, and provide comprehensive assessment of the responses of individual genotypes through NIR, IR and visible image based procedures. Phenotyping protocols have been optimized for image acquisition and image analysis for crops such as soybean and mungbean. Phenomics platform was employed to identify mungbean genotype producing more biomass with less water relative to Vaibhav (local check).

Images	Utility	Image acquisition
Visible	Growth, senescence, shoot architecture	225 pots
Infrared	Canopy temperature, Indirect indicator of roots	Image acquisition-in 3
NR	Plant water relations	Processing- 1 hour Output : 225 pots x 7x600 column



Image Acquisition → Image Processing → Image Analysis

ICAR-NIASM Phenomics facility

Low cost indigenous phenotyping tool

Prototype for low cost indigenous phenotyping tool was developed to screen large number of genotypes in the field condition for measurement of canopy temperature, ground cover and leaf senescence. This can be used as tools for robust and rapid image based data analysis.

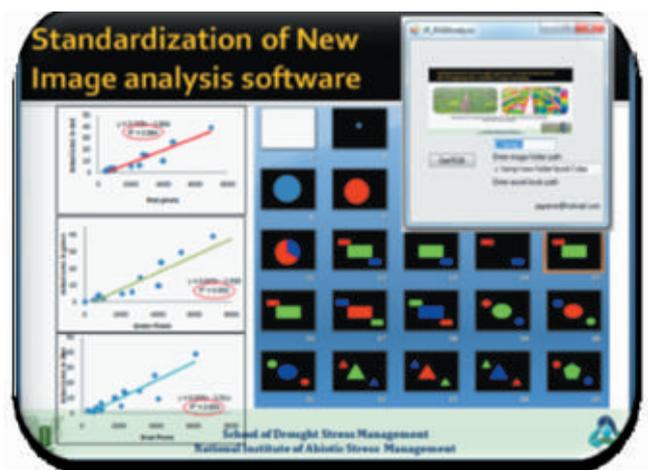


Image acquisition and analysis tool for field phenotyping

Breeding and seed production of *Heteropneustes fossilis* (Singhi) in Western Maharashtra

Stinging catfish is a freshwater fish species native to India. A protocol was standardized for low cost breeding and seed production technology

in drought prone area of Maharashtra without sacrificing male brood of Singhi.



Hormonal injection in Singhi, fertilized eggs and larvae

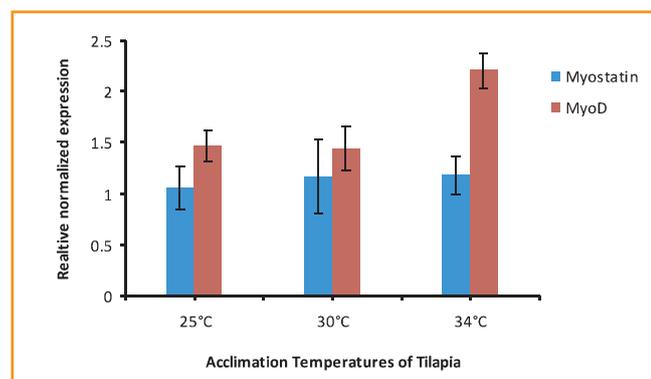
Impact of temperature on Tilapia (*Oreochromis mossambicus*)

Tilapia is a fast growing fish which is able to withstand varying environmental condition. Juvenile tilapia was exposed to 25, 30 and 34°C constant temperatures to understand the impact of stress caused by high habitat temperature on fish growth, white muscle cellularity and expression of muscle genes, *MyoD* and *Myostatin*. At 60 day, fish juveniles reared at 30°C grew significantly higher than the 25°C and 34°C reared fish. The white muscle histology revealed significantly higher frequency of muscle diameter in the range of 25-50 μm in fishes reared at 30°C. Expression of *MyoD* was observed to be significantly higher at 34°C whereas *Myostatin* gene expression did not vary with change in rearing temperatures. The study suggests that environmental temperature affect the fish growth, muscle recruitment and expression of genes responsible for muscle formation.

Research Highlights



Transverse section of tilapia (*Oreochromis mossambicus*) mosaic pattern of small and large white muscle fiber (100µm bar)

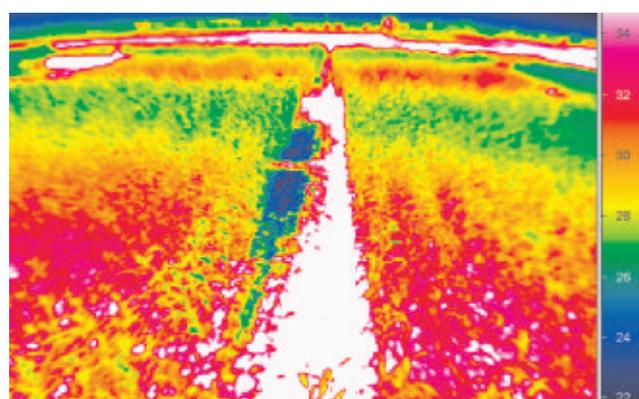


qRT-PCR quantification of *MyoD* and *Myostatin* mRNA expression in white muscle of tilapia *Oreochromis mossambicus* reared at 25°C, 30°C and 34°C

Plant bioregulators enhance water productivity of sorghum (*Sorghum bicolor* (L.) Moench)

Perceptive of the water stress on yield formation is essential for planning of irrigation, natural resources and other mitigation strategies. Therefore, a field experiment (2014-16) was conducted to evaluate the interactive effects of exogenous application of plant bioregulators (PBR) and supplemental irrigation on yields and water productivity (WP) of *rabi* sorghum (Cv. Phule Suchitra). Exogenous spraying of PBR's included: 10 µM salicylic acid (SA), 100 mg L⁻¹ sodium benzoate (SB), 500 ppm thiourea (TU), 1.5% potassium nitrate (KNO₃) applied at seedling

elongation (20 DAS), reproductive (50 DAS) and panicle emergence (75 DAS) stages and control (no spray of PBR). Seven levels of irrigation water (IW) equaling to 0.95, 0.80, 0.65, 0.50, 0.35, 0.20 and 0.05 times of the CPE (cumulative open pan evaporation) were maintained using line source sprinkler system (LSS). It has been found that application of PBR's enhanced the grain yield, straw yield and water productivity of sorghum by 6.8-18.5%, 5.7-14.7% and 0.39-1.41 kg m⁻³, respectively. Application of salicylic acid (10 µM) at higher irrigation levels and sodium benzoate (100 mg/L) and thiourea (500 ppm) at water deficit regimes was found best to alleviate the impact of water stress. Overall PBR's helped to reduce water use by 25-49%. The integrated use of bio-regulators with deficit irrigation can substantially enhance the productivity vis-a-vis profitability from cultivation of *rabi* sorghum under water scarce conditions.



Intensity of water stress on sorghum as affected by PBR's at various quantities of applied water at 75 DAS

Influence of deficit irrigation strategies at different growth stages on growth, fruit yield and physio-chemical quality of tomato (*Lycopersicon esculentum* Mill.)

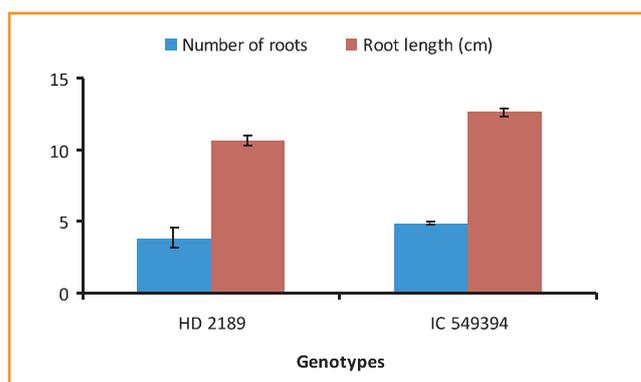
The regulated deficit irrigation (RDI0.8 i.e 0.8xETc) did not affect the marketable fruit yield (MFY) as compared with the full irrigation (FI 78.0 Mg ha⁻¹). The water productivity of 19.2 kg m⁻³ was the maximum under RDI0.8. The MFY was improved by 4% with DI0.6 at vegetative stage while DI0.6 at flowering stage showed little effect and a decline of 7% was monitored with DI0.6 at fruiting stage. The DI0.6 applied at either of two stages vegetative & flowering, flowering & fruiting and vegetative & fruiting resulted in 14-18% decline in MFY. The crop was able to tolerate interruptions of irrigation for 15 days at growth stages and the decline in yield was only 3-7%, the highest being at fruiting stages.

Fruit quality and functional food properties improved with DI. Colour (a/b* ratio) and the concentrations of vitamin C increased by 82 and 70% with RDI0.6 compared to FI. With-holding irrigation during fruit development induced colour development (52%), vitamin C content (16%) and recorded better lycopene content (10.2 mg/100 g). The total phenolics and flavonoids ranged between 16 and 42 mg gallic acid equivalent/100 g and 4–10 mg catechin equivalent/100 g respectively with higher values recorded under DI at fruiting stage. Antioxidant activity (AOA) tested with different in vitro assays revealed the positivity of DI on improvement of bioactive compounds. Superoxide dismutase activity was significantly higher in DI treatments at fruiting stage compared to catalase activity.

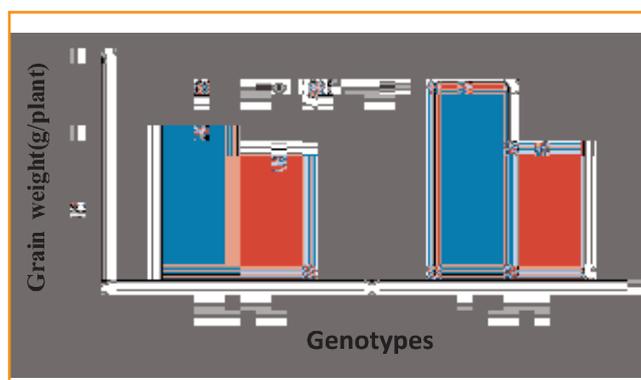
Genes and traits associated with drought tolerance in wheat

To assess genetic variation in drought tolerance, 60 wheat genotypes collected from

ICAR-National Bureau of Plant Genetic Resources, New Delhi, were screened under field conditions. Traits such as stay green feature measured by chlorophyll index using SPAD meter, shoot biomass, chlorophyll fluorescence and yield related attributes were evaluated. Genetic variation was also measured in Relative Water Content (RWC), CO₂ assimilation rate and transpiration rate under well-watered and water stressed condition. Based on these parameters IC-549394 was identified as a promising genotype with high adaptability to soil moisture deficit. This genotype had deeper root system, more roots and profuse root branching. The superiority of this genotype over local check could be attributed to higher expression of *CBF4* and *CDPK19* genes both under well-watered and water stressed conditions.



Comparison of root traits measured in vitro in promising wheat genotype and local variety HD-2189



Grain weight measured in promising wheat genotype relative to local variety HD-2189

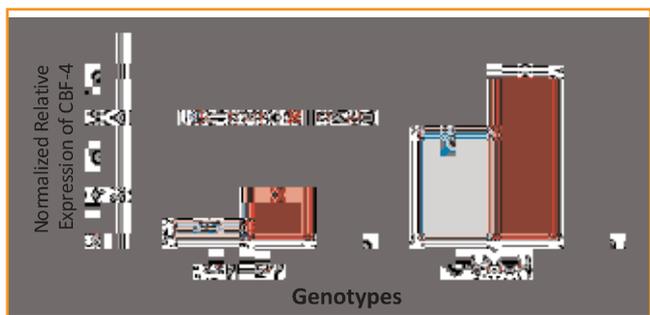
Research Highlights



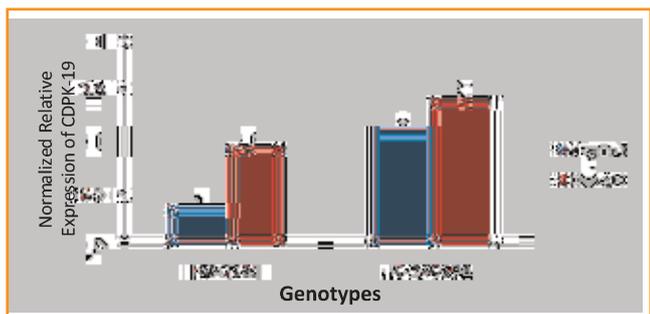
HD-2189

IC-549394

Root system architecture of HD-2189 and IC-549394



qRT-PCR analysis of *CBF4* gene in HD-2189 and IC-549394

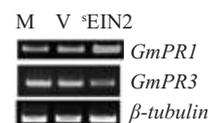


qRT-PCR analysis of *CDPK19* gene in HD-2189 and IC-549394

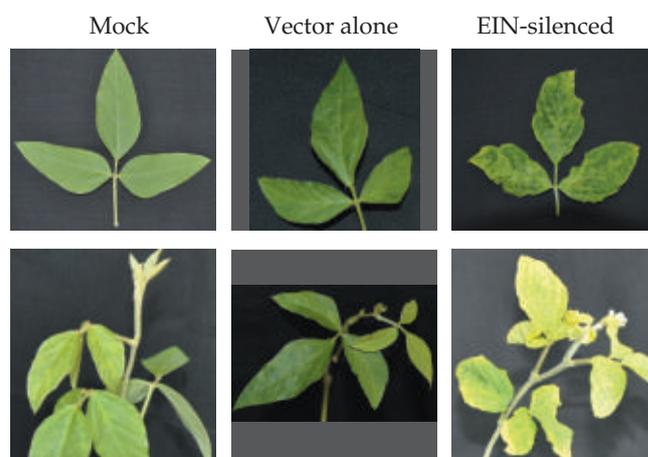
Virus induced gene silencing in soybean

Virus induced gene silencing (VIGS) technique was successfully used to investigate the role of candidate genes associated with drought tolerance in soybean. Selected soybean genotypes including locally well adapted cultivar JS-335, and

NRC-37 were used in the experiment to silence *Ethylene-In-sensitive2 (EIN2)* gene and to validate its role in drought tolerance. *EIN2*-silenced soybean plants exhibited a drought-tolerant phenotype characterized by low levels of transpiration and enhanced expression of drought-responsive genes. In addition, *EIN2* silenced soybean plants exhibited increased expression of SA responsive *PR1* gene, reduced expression of JA responsive *PR3* gene but had high level of ADP Riboxylation factor and *WRKY-39* gene indicating significance of these genes in imparting drought tolerance.



Silencing of *EIN* gene and expression profiling of genes associated with water stress tolerance in soybean



Phenotype of mock, vector alone and *EIN* gene silenced soybean plants





RNAi and Virus-Induced Gene Silencing (VIGS) in soybean

Experiments were initiated to enhance drought and heat stress tolerance in soybean and identification and functional characterization of master genes associated with drought and heat stress tolerance mechanisms in soybean employing RNAi and VIGS approaches.

Screening of soybean for waterlogging tolerance

A set of more than 100 germplasm lines of soybean including important high yielding varieties were collected from IISR, Indore for evaluating waterlogging tolerance. A field experiment has been conducted to screen the tolerant varieties/lines where waterlogging treatment was imposed at vegetative and reproductive growth stages. Responses of plants to waterlogging was evaluated based on various parameters such as depletion of chlorophyll content, plant biomass, yield and yield attributes and changes in root anatomy.



Waterlogging treatment at vegetative stage

On-farm demonstration of "Improved rice production technology" under TSP

More than 100 tribal farmers of various villages from Navapur Taluka of Nandurbar (MS)

were selected under TSP for on-farm demonstration of improved rice production technology suitable for the area. HYV seeds of rice var. Indrayani and Phule Samruddhi were distributed to the farmers. Fertilizer briquettes were supplied to all the beneficiaries. On-farm training was also given to the farmers for proper adoption of the technology.



Distribution of fertilizer briquettes to farmers

Protocol for assessment of heavy metals in aquatic bodies

ICP-MS based protocol has been standardized for assessment of multiple metals such as Li, Be, Na, Mg, Al, K, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, As, Se, Rb, Sr, Cd, Cs, Sn, Sb, Hg, Pb and Bi in the surface water, soil sediments and fish tissue samples viz. gill, liver, kidney, muscle and gonad. In addition, enzyme based protocols have been standardized as biomarkers for monitoring heavy metals contamination in aquatic water bodies.

Standardization of extraction protocol for crude biomolecules from bacterial isolate using XAD-16

XAD-16 based method has been standardized for extraction of microbially derived biomolecules using UHPLC.

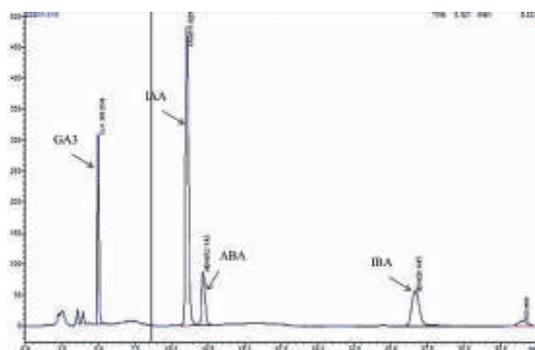
New Initiatives



XAD16 based method for extraction of microbial metabolite

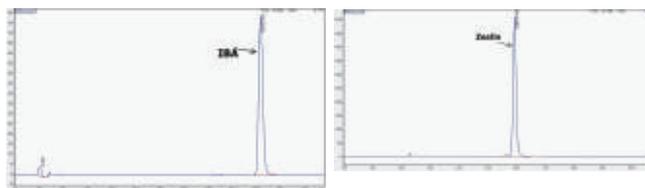
Standardization of rapid method for quantitative detection of IAA and IBA

Bacterial isolates obtained from different saline soil samples were evaluated for their plant growth promotional traits in terms of IAA, siderophores under simulated drought and salinity stress. UHPLC based methods for rapid determination of bacterially elaborated biomolecules were developed, mainly for plant-growth hormones. The methods for rapid detection and quantification of IAA, IBA, GA₃, Zeatin and ABA were standardized. Using these methods, presence of all the above hormones was successfully determined in the organic extracts of the isolates. The average frequency of plant hormones in the organic extracts of the isolates was IAA > GA₃ > IBA > ABA; while the abundance of the hormones found to be IAA > IBA > GA₃ > ABA in the tested isolates. Further, the method for metabolite profiling has also been developed to resolve the



UHPLC chromatogram for biomolecules

fine aspects of bacterial metabolic diversity under different stress situation. This method successfully resolved the differences within the organic extracts of single isolate cultivated under varying stresses.



HPLC profile for standards of plant growth hormones (IBA, IAA, Zeatin and ABA)

Integrated agri-aquaculture

ICAR-National Institute of Abiotic Stress Management, Baramati has successfully implemented improved technology interventions in field and horticulture crops, dairy, poultry and



Demonstration of integrated agri-aquaculture

fish farming, and integrated farming in various villages of Navapur tehsil in Nandurbar district of Maharashtra for improving the livelihood of resource poor tribal farmers under Tribal Sub-Plan (TSP).

Development of zinc nanoparticles for mitigation of abiotic stress in fishes

Zinc nanoparticles (Zn-NP) have been developed from fisheries waste and it was incorporated as feed supplements for novel feed

formulation to mitigate abiotic stress. A 75 days experiment was conducted to evaluate the mitigating role of Zn-NP against abiotic stress such as heavy metal and high temperature. It was observed that fish growth was noticeably ($p < 0.01$) higher in Zn-NP fed group and also cellular metabolic stress has been reduced. The immunological status of the fish was also improved significantly after bacterial challenge. Overall results indicated that dietary Zn-NP can confer protection to fish against abiotic stress.



Major events

International Yoga Day

International Yoga Day was celebrated on June 21, 2016 by following the Common Yoga Protocol from Ministry of AYUSH, Government of India. About 40 staff members participated in the Yoga Day celebration at 6:00 AM. The programme was started with the display of speech by Honorable Prime Minister Shri Narendra Modi delivered at the 69th session of United Nations General Assembly on September 27, 2014. The Yogic Practice was started with a prayer to enhance the benefits of practice. Dr. Pravin Taware, Technical Officer instructed the session that included Yogasanas (Tadasana, Vrksasana,

Pada-hastasana, Ardha-chakrasana, Trikonasana, Bhadrasana, Ardha-ustrasana, Bhujangasana, Shalabhasana, Pavanmuktasana and Savasana), Pranayamas (Kapalbhati, Anulom-vilom and Bhramari) and Dhyana. The session concluded with Sankalpa for healthy, peaceful and joyful self.

Distribution of HYV seeds of jowar to farmers under MGMG

A HYV seed of jowar Cv. Phule Suchitra grown in experimental plots of the institute was distributed to the selected farmers of the adopted village Nimbodi and Lakadi of Indapur Taluka, Pune under MGMG on 30th July 2016. Complete



Major events

package of practices for cultivation of jowar was also imparted to the farmers. A large number of farmers showed keen interest in cultivation of jowar. Most of the farmers in these villages are cultivating traditional variety of jowar i.e, Maldandi.

Interaction Meeting with Scientists of ICAR-CCARI, Goa

An interaction meet between scientists of ICAR-NIASM, Baramati and ICAR-CCARI (Central Coastal Agriculture Research Institute), Goa was organized on August 1-2, 2016. It was a follow up action to the proceedings of NRM division's Director's Meet held at ICAR-CCARI, Goa during 11-12 April, 2016. In the meeting, Director, ICAR- NIASM presented an appraisal report on research facilities and ongoing research work of ICAR-NIASM to be a potential partner for research collaboration with ICAR-CCARI, Goa. Director, ICAR-CCARI, Goa in his presentation highlighted potential area where ICAR-CCARI need to be collaborating with ICAR-NIASM for utilization of available facilities at both the institutes to address abiotic stresses in agriculture for the benefit of poor stake holder i.e. farmers. Thereafter scientists of ICAR-CCARI, Goa delivered talk in their respective area of research and also insight into most suitable themes where they wish to collaborate with ICAR-NIASM. A through discussion was held to conclude the session and the point for potential collaboration were suggested. All the scientists of ICAR-NIASM, Baramati participated in the meeting. Dr. Narendra Pratap Singh in his concluding remarks appreciated the way by which the meeting organized and stressed upon the frequent visit of scientist from ICAR- NIASM to ICAR-CCARI, Goa and vice- versa to exchange the ideas and utilization of the facilities available at both the institute.



Independence Day Celebration

69th Independence day was observed on 15th August 2016 in the institute and National Flag was hoisted by the Director. All the staff members along with their family participated in the event. A number of games were also organised on the day.



Ganesh Festival Celebration

Keeping in tune with the great tradition of Maharashtra, the institute staff celebrated Genesha Chaturthy during 5th to 9th September 2016.



Participation in ICAR Zonal Tournament 2016 - Western Zone

A fourteen member squad namely- Dr. Yogeshwar Singh, Dr. K.K. Meena, Dr. D.D. Nangare, Dr. G.C. Wakchaure, Dr. R.L. Choudhary, Dr. Neeraj Kumar, Dr. Prashantkumar S. Hanjagi, Mr. Paritosh Kumar, Mr. P.R. Chahande, Mr. R.S. Ghopane, Mr. Sunil Potekar, Mr. Lalit, Mr. Pravin More and Mr. Aniket More from ICAR-NIASM participated in the ICAR Zonal Tournament 2016 - Western Zone held at ICAR-NRCC, Bikaner during September 24-27th, 2016. All fourteen contingents participated in various games namely Volleyball, Kabaddi, Basketball, Football, Table tennis, Badminton, Chess, Shotput, Discuss throw, Carom and 200, 400, 800 and 1500 m Race in the sports meet. Dr. Prashantkumar S. Hanjagi received three medals viz., Gold, Silver and Bronze in 200, 400 and 1500 m race, respectively. Kabaddi and football team reached up to semi-final.



TSP Farmer's Training Programme

ICAR-National Institute of Abiotic Stress Management (NIASM), Baramati is undertaking activities related to improved technology interventions in field crop, horticulture, livestock, poultry, fisheries and integrated farming in various villages of Navapur Tehsil in Nandurbar district. In this regard, recently Dr. Narendra Pratap Singh (Director, ICAR-NIASM), Dr. K.K. Krishnani (Chairman-TSP), TSP-members Dr. N.P. Kurade, Dr. D.P. Patel, Dr. A.V. Nirmale and Dr. Neeraj Kumar visited Navapur for reviewing the on-going TSP activities. Training programme on "Nutritional management in livestock and fisheries for livelihood improvement of tribal farmers" was conducted at Visarwadi and Navapur on 17-18th September 2016. About 400 farmers from various villages of Navapur Tehsil participated and benefitted.

हिन्दी चेतना मास/ हिन्दी दिवस 2016

संस्थान में राजभाषा हिन्दी के प्रयोग को बढ़ावा देने हेतु हिन्दी चेतना मास (01 से 30 सितम्बर 2016) का आयोजन किया गया। इस कार्यक्रम का उद्घाटन दिनांक 1 सितम्बर 2016 को मुख्य अतिथि श्री अनिल कुमार वलीव, उप-परिवहन अधिकारी, उप-प्रादेशिक परिवहन कार्यालय, बारामती की उपस्थिति में सम्पन्न हुआ। इस दौरान कार्यालय में हिन्दी लेखन, हिन्दी टाइपिंग व हिन्दी में बात-चीत को बढ़ावा देने के लिए विभिन्न प्रतियोगिताओं जैसे- हिन्दी टिप्पण लेखन, हिन्दी निबंध लेखन, अंग्रेजी से हिन्दी में अनुवाद, हिन्दी गायन प्रतियोगिता, कम्प्यूटर पर यूनिकोड में हिन्दी टंकण प्रतियोगिता, हिन्दी सामान्य ज्ञान प्रतियोगिता, हिन्दी कविता पाठ एवं वाद-विवाद इत्यादि प्रतियोगिताओं का आयोजन किया गया। स्थानीय स्कूल एवं कालेज के विद्यार्थियों के बीच राजभाषा हिन्दी के प्रयोग को बढ़ाने के लिए भी वाद-विवाद प्रतियोगिता का आयोजन किया गया जिसमें बारामती के आस-पास के स्कूल एवं कालेज से बड़ी संख्या में विद्यार्थियों ने भाग लिया। दिनांक 14 सितम्बर 2016 को हिन्दी

Major events

दिवस के रूप में मनाया गया जिसमें श्री सुरजीत कुमार साह, मुख्य प्रबन्धक, भारतीय स्टेट बैंक, बारामती मुख्य अतिथि के तौर पर शामिल हुए। संस्थान के निदेशक एवं राजभाषा कार्यान्वयन समिति के अध्यक्ष, डॉ नरेंद्र प्रताप सिंह ने अपने अध्यक्षीय भाषण में संस्थान के दैनिक कार्यों में राजभाषा हिन्दी के प्रयोग को बढ़ावा देने के साथ-साथ एक हिन्दी पत्रिका के शीघ्र प्रकाशन पर भी बल दिया। कार्यक्रम का समापन एवं पुरस्कार वितरण समारोह 03 अक्टूबर 2016 को डॉ नरेंद्र प्रताप सिंह, निदेशक, भाकृअनुप-राष्ट्रीय अजैविक स्ट्रैस प्रबंधन संस्थान की अध्यक्षता में सम्पन्न हुआ। इस अवसर पर निदेशक महोदय ने विभिन्न प्रतियोगिताओं में विजयी कर्मचारियों को नकद पुरस्कार एवं प्रमाण-पत्र प्रदान किया। हिन्दी प्रोत्साहन योजना के अंतर्गत गतवर्ष के दौरान राजभाषा हिन्दी के प्रयोग में उल्लेखनीय योगदान देने वाले कर्मचारियों को भी नकद पुरस्कार एवं प्रमाण-पत्र दे कर सम्मानित किया। निदेशक महोदय ने अपने सम्बोधन में संस्थान के राजभाषा कार्यान्वयन समिति के सदस्यों एवं सभी कर्मचारियों को हिन्दी चेतना मास व हिन्दी दिवस के सफल आयोजन एवं उनके सक्रिय भागीदारी के लिए बधाई देते हुए भविष्य में राजभाषा हिन्दी के प्रयोग में और आधिक योगदान देने का आग्रह किया। इसके साथ ही सभी वैज्ञानिकों एवं तकनीकी अधिकारियों से सभी राजभाषाओं का सम्मान करते हुए स्थानीय भाषा में अपने लेख लिखने के लिए प्रेरित किया। हिन्दी चेतना मास कार्यक्रम का समापन डा. डी.पी. पटेल, प्रधान वैज्ञानिक (पादप कार्यिकी) एवं प्रभारी हिन्दी अधिकारी के धन्यवाद ज्ञापन के साथ सम्पन्न हुआ।



निदेशक एवं अध्यक्ष, राजभाषा हिन्दी समिति द्वारा हिन्दी दिवस समारोह का सम्बोधन

Gandhi Jayanti and Swachh Bharat Oath

Gandhi Jayanti was observed on 2nd October 2016 and an awareness programme on Swachh Bharat Abhiyan was organized. The staff of the institute along with villagers and members of Gramsabha, Malegaon Khurd took Swachhata Shapath.





ITMU Cell activities

Recruitment of SRF

- One SRF was recruited under ITMU Cell in the month of September 2016.

Registration of Trademark

- Initiative was taken and necessary formalities have been completed for registration of institute logo as Trademark under two classes i.e, 31 & 44 which covers product and services.

Workshops/Seminar/Symposia/Training attended

- Dr. K.K.Krishnani, Head (SESM) participated in 3rd International IUPAC Conference on “Agrochemicals Protecting Crops, Health and Natural Environment” at IARI, New Delhi during 6-9th April, 2016 and Felicitated to chair technical session of invited talks and also delivered resource lecture on Biotechnological tools for enhancing biodegradation of persistent organic compounds.
- Dr. Neeraj Kumar, Scientist (Fish Nutrition & Biochemistry) attended 3rd International IUPAC Conference on “Agrochemicals protecting Crops, Health, & Natural Environment” at IARI, New Delhi during 6-9th April, 2016.
- Dr. S.K. Bal, Principal Scientist (Agrometeoro-

logy) & I/C Head (SASM), participated and delivered an ignited presentation on “Future Thrust and Strategies of Agrometeorological Research in India” in a brainstorming session organized at ICAR-CRIDA, Hyderabad on 29th April, 2016.

- Dr. Jagadish Rane, Head (SDSM), participated in Interactive Meet of Directors & Finance Officers of ICAR Institutes (West Zone) at ICAR-CIFE, Mumbai on 6th May, 2016.
- Drs. S.K. Bal, Jagadish Rane, K.K. Krishnani attended brainstorming session on 'Abiotic Stress Management with Focus on Drought, Flood and Hailstorm at NASC, New Delhi during 21-24th May, 2016.
- Dr. Jagadish Rane, Head (SDSM), attended 86th Board of Studies meeting in Agril. Botany, MPKV, Rahuri on 25th May, 2016.
- Dr. K.K. Krishnani, Head (SESM) delivered resource lecture on “Bioremediation of chemical and microbial contaminants in aquaculture – Application of molecular and nanotechnological tools at Central Institute of Fisheries Education, Mumbai on 25th May 2016.
- Dr. Jagadish Rane, Head (SDSM), signed a MoU with IGKV, Raipur for collaborative research including students at Raipur during 30-31st May, 2016.
- Dr. K.K.Krishnani, Head (SESM) participated in Pre-RMP Management Development Programme on Leadership development at National Academy of Agricultural Research Management, Hyderabad, during 7-18th June 2016.
- Dr. Jagadish Rane, Head (SDSM), attended RAC meeting in NIBSM, Raipur during 11-13th July, 2016.

Major events

- Mr. Rajkumar, Scientist (Agricultural Entomology) attended three months professional attachment training at ICAR- IIHR, Bangalore during 7th June to 6th September 2016.
- Dr. Jagadish Rane, Head (SDSM), chaired the plenary session of Annual Meeting of Maharashtra Grape Growers Association at Pune during 26-28th August, 2016.
- Mr. Paritosh Kumar, Scientist (Environmental Sciences) attended professional attachment training at ICAR- IARI, New Delhi during 22nd May, 2016 to 6th September, 2016.
- Mrs. Sravanti Bandela, Scientist (Spices, Plantation & Medicinal & Aromatic Plants) attended three months professional attachment training at Dr. Jayashankar, Telangana State Agricultural University, Hyderabad during 30th May, 2016 to 29th August, 2016.
- Dr. S. K. Bal, Principal Scientist (Agrometeorology) & I/C Head (SASM), attended 1st PIs' meeting of DST sponsored BDA-HSRS project (Theme: Agriculture) organized by ICAR-NBSSLUP, Nagpur on 21st June, 2016.
- Mr. Pravin More, Technical Assistant (Computer) attended training on "Implementation of NIC's e-procurement solution through CPP portal" at ICAR-NDRI Karnal during 21-22nd July, 2016.
- Mr. Pardeep Kumar, Assistant attended training on "Implementation of NIC's e-procurement solution through CPP portal" at ICAR-NDRI Karnal during 21-22nd July, 2016.
- Dr.K. K. Krishnani, Head (SESM) participated in Workshop at Cochin University of Science and Technology, Kochi, India during 23-24th July, 2016.
- Dr. K. K. Krishnani, Head (SESM) delivered invited / resource lecture on "Recent advances and molecular perspectives of microbial bioremediation in aquatic environment" at Central Institute of Freshwater Aquaculture, Bhubaneswar, India on 30th July, 2016.
- Mr. Sunil Potekar, Technical Assistant (Agrometeorology) attended training on "Agro meteorological Data Collection, Analysis and Management at ICAR-CRIDA, Hyderabad during 25th July 2016 to 6th August, 2016.
- Dr. Mahesh Kumar, Scientist (Plant Physiology) attended National conference on "Bringing Self Sufficiency for Pulses in Eastern India" at Bihar Agricultural University, Sabour during 05-06th August, 2016.
- Dr. K.K.Krishnani, Head (SESM) delivered invited/resource lecture on "Integrated approach for assessment and remediation of contaminants in soil, water and related aquatic environment" in DST sponsored Inspire Internship Camp at Pt Ravishankar Shukla University, Raipur during 12-14th August, 2016.
- Mr. V. Rajagopal, Scientist (Soil Chemistry, Fertility & Microbiology) attended International conference on "Agriculture, Food Science, Natural Resource Management and Environmental Dynamics: The Technology, People and Sustainable Development" at BCKV, Kalyani, West Bengal during 13-14th August, 2016.
- Dr D.D. Nangare, Scientist SS (Soil & Water Conservation Engineering) participated in training programme on "Analysis of experimental data" at NAARM, Hyderabad during 18-23rd August, 2016.

- Dr. Jagadish Rane, Head (SDSM), attended 24th Meeting of Regional Committee No. VII organized at Goa during 8-9th September, 2016.
- Mr. V. Rajagopal, Scientist (Soil Chemistry, Fertility & Microbiology) attended State level seminar on “Development in Soil Science: Climate change and its influence in natural resource management” organized at BSKKV, Dapoli during 22-23rd September, 2016.
- Mr. Pravin More, Technical Assistant (Computer) attended training on Cyber security at ICAR- IASRI, New Delhi during 28th September to 5th October, 2016.
- Mr. Santosh Pawar, Technical Assistant (Electrical) attended training on “Project Management” organized by National Council for Training and Social Research (NCTSR), New Delhi at Goa during 21-23rd September, 2016.



Personalalia

Award/ Recognition

- Dr. K.K. Krishanani, Head (SESM) was elected at NAAS Fellow at the National Academy of Agricultural Sciences, New Delhi on 4-5th June 2016, for his outstanding contribution on “Bioremediation of aquatic contaminants using molecular tools”.
- Dr. Neeraj Kumar, Scientist (Fish Nutrition & Biochemistry) received best publication of the Year 2015 Award on June 11, 2016 from ICAR-CIFE, Mumbai.

Promotions

- Smt. Purnima Shashikant Ghadge promoted to Assistant Administrative Officer on 17-06-2016.
- Dr Pravin Taware promoted to Sr. Technical Officer (T6).

Joining

- Mrs. Bandela Saravanti joined as Scientist (Spices, Plantation & Medicinal & Aromatic Plants) on 7th April 2016.
- Mr. Rajkumar joined as Scientist (Agricultural Entomology) on 11th April 2016.
- Mr. Paritosh Kumar joined as Scientist (Environmental Sciences) on 11th April 2016.
- Dr. Narendra Pratap Singh joined as Director of the ICAR-NIASM on 12th September 2016.

Superannuation

- Dr. P. S. Minhas, Director, ICAR- NIASM superannuated on 30th April, 2016.
- Mr. Milind. S. Bhatkar, Administrative Officer opted for VRS and superannuated on 21st September 2016.





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Dr Narendra Pratap Singh, Director, ICAR-NIASM, Malegaon, Baramati- 413 115, Pune (MS), India.

Phones : (02112) 254057, 254058 • Fax : (02112) 254056 • Email: director@icar.gov.in

website: www.niam.res.in

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Flamingo Business Systems, 19, Laxminagar Commercial Complex No. 1, Pune - 411 009
Tel.: 020-24214636, 09049400137, Email : flamingo.b.s@gmail.com, srgupta.tej@gmail.com