



भाकृअनुप - राष्ट्रीय जैविक स्ट्रेस प्रबंधन संस्थान

ICAR - NATIONAL INSTITUTE OF BIOTIC STRESS MANAGEMENT

Baronda, Raipur - 493 225, Chhattisgarh



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Edited and compiled by:

Dr. R. K. Murali Baskaran
Dr. K. C. Sharma
Dr. P. N. Sivalingam
Dr. Mamta Choudhary
Dr. P. Mooventhan
Mr. Yogesh Yele

Published By:

Director,
ICAR-National Institute of Biotic Stress Management,
Baronda, Raipur,
Chhattisgarh 493 225,
Telefax: 0771-2225333,
Email: director.nibsm.cg@nic.in
Website: www.nibsm.org.in

From the Director's desk

I am extremely happy in bringing out this issue of semesterly Newsletter of ICAR-NIBSM for the period ending June, 2017. As has been narrated earlier also, the institute will house an interdisciplinary infrastructure that is required for frontier research in crop health issues of the country and for imparting education in cutting edges of interdisciplinary research and its translation into promising farm technologies which will promote prosperity of Indian farmers. To fulfil this requirement, the masterplan of the institute has been successfully envisaged and approved with the combined efforts of a dedicated team of NIBSM scientists, CPWD (central zone) and concerned ICAR authorities. The entire NIBSM team profusely thank Dr. Trilochan Mohapatra, Secretary DARE and DG, ICAR for his keen interest, personal involvement and constant encouragements in the overall growth of the institute. Approved masterplan is featured with an adequate infrastructure to pursue research and higher education as per the mandate of the four schools proposed at the time of envisioning the mandate of the institute. Student hostels meeting best standards of study ambience for boys and girls as well as guest researchers/faculty from national and international sources have been targeted to be created before the end of 2018. It has been ensured that the 70 per cent of the total area of land allotted to NIBSM has been earmarked for developing a model research farm. The remaining 30 per cent of the area will cater the requirement of office buildings, hostels, guest house, residents, sports complex and shopping/community centre. Approval from the district town and planning department with the help of CPWD is another feather in the cap while efforts for infrastructure development were pursued. NIBSM could succeed in getting allocation of Rs. 54.7 crores under 12th plan which enabled CPWD to float tenders for construction of Administration block including schools, laboratories, library, auditorium, conference room, computer facilities, directors office, registrar office, controller office, canteen, girls hostel, international student hostel, boys hostel, field crop research centre, insectary etc. A proposal for creation of 69 scientific posts, 50

technical staff members and 40 administrative staff members stand approved from the council and awaits clearance of finance ministry.

Team of dedicated scientists carried on respective duties with utmost sincerity not only in scientific sphere but dispensed their responsibilities in infrastructure build up with equal zeal. In addition to mitigation of losses due to various biotic stresses confronted by Indian farmers, the research projects have also been formulated to investigate issues of protecting human or animal life or health from risks arising from additives, contaminants, toxins or disease causing organisms in food, beverages or food stuffs. Innovative projects are being pursued to create public awareness through institutional outreach programmes for addressing protection of human life or health from risks arising from diseases carried by animals, plants or products thereof, or from the invasive entry, establishment or spread of pests.

An old farm store building as well as residential quarters existing from IGKV time have been renovated to house laboratories and sitting space for more than a dozen of scientists. Tender process to the tune of 1.5 crores is in full swing to procure modern equipments and laboratory infrastructure pertaining to specified mandate based upon the new frontier sciences of genomics, proteomics, DNA fingerprinting, bioinformatics etc. Through voluntary outreach activities and MGMG programmes, a small group of scientists belonging to varied disciplines of agricultural science are now compulsorily engaged in farmer scientific interactions in several villages of Raipur and nearby districts of Chhattisgarh.



(Jagdish Kumar)
Director (Acting)

Research Highlights

On-farm evaluation of new weedicides in rice ecosystem

(Anil Dixit, V. K. Choudhary, P. Mooventhan)

Pretilachlore 6% + Pyrazosulfuron 0.15% was applied 5-7 days after transplanting of rice in farmers' holdings of Dhamtari, Bilaspur and Raipur districts of Chhattisgarh to manage major weed flora. The weed control efficiency was about 70-91% coupled with enhancement of grain yield by 40-50% irrespective of locations and varieties. The adoption of this technology was 60% in these regions.

Weed spectrum influenced by nitrogen regimes in rice-wheat cropping system

(V. K. Choudhary, Anil Dixit)

Application of different doses of nitrogen, ranging from 0-125% and recommended doses of P₂O₅ and K₂O (60 and 40 kg/ha, respectively) in rice cultivar, Swarna indicated that the highest weed density, dry weight and diversity were noticed in N₀ plots and least with N_{125%}. The relative density of broad leaved weeds ranged from 29.1-44.4%, grasses with 23.1-51.2% and sedges with 19.8-34.4%. The highest rice grain yield was recorded in rice applied with N_{125%} (6.43 t/ha), followed by N_{100%} (6.1 t/ha) while the lowest grain yield was recorded in rice plots without nitrogen (3.6 t/ha). Due to initial poor canopy coverage in wheat, maximum weed density was estimated in N₀. The SPAD value was highest with N_{125%} followed by N_{100%} and lowest with N₀. The highest seed yield was harvested with N_{125%} (3.30 t/ha), followed by N_{100%} (3.23 t/ha) as against the control (1.0 t/ha). It was noticed that the application of 25% additional nitrogen than the RDN has shown some additional yield but was statistically comparable.

Influence of dhaincha (*Sesbania aculeata*) on weed suppression in transplanted rice

(V. K. Choudhary, Anil Dixit)

Findings depicted that rice plants took 30% lesser time to get established in main field (5.25 days) coupled with a savings of 27.5% of fertilizer over without *Sesbania* incorporated plots. Similarly, water requirement was reduced by 40.3% in *Sesbania* incorporated plots. The rice plants in *Sesbania* incorporated plots were 3% taller, 30.3% more tillers, 15.1% higher panicles (panicles were 4.7% longer, 8.2% heavier), 14.2% more filled grains, and 19.8% lower chaffy grains than without *Sesbania* incorporated plots which enhanced the grain yield of 7521.1 kg/ha, and 20.3% higher over without *Sesbania*. Similarly, straw yield was increased (8647.2 kg/ha) by 7.1% than *Sesbania* unincorporated plots. It was also noticed that *Sesbania* incorporated rice plots had suppressed 58.5% of grasses, 59.1% of broadleaved weeds and 44.9% of sedges. The total weed suppression was noticed with 58.7%.

Weedy rice diversity in Chhattisgarh

(V. K. Choudhary, Anil Dixit)

The weedy rice was collected from Raipur, Raigarh, Mahasamund, Janjgir-Champa and Baloda Bazar districts of Chhattisgarh. Various weedy rice accessions were collected from above places and as per the distinct characters, 15 different group of weedy rice were identified. Under normal condition, only two land races could germinate that took more than seven days, and were more close to Mahamaya type. Imposition of hot water treatment stimulated eight land races to germinate. These were grown on pots. The preliminary findings warn the potential threat of weedy rice in summer rice too. Increase in water temperature may stimulate the seeds of weedy rice available in seed bank to germinate and get them established, which may escape of early weed management and flowering and maturity may synchronise with main crop and potential chance of seed mixture and further dissemination of seeds in larger area due to seed mixture.

Influence of *Echinochloa* density on growth and yield of rice

(V.K. Choudhary, Anil Dixit)

Echinochloa was grown on the pots at different density (0-7 per pot with two rice seedlings/pot). It was noticed that plants were taller with increase in *Echinochloa* density from 2-7.2%. It was also observed that the *Echinochloa* height was increased with increase in density/pot to the tune of 6-22% lowest in one *Echinochloa* to highest with 7/pot. There was competition for the resources among the plants resulted less tillers/hill, lower number of total leaves/tiller, shorter leaves and narrow leaves.

In vitro screening of promising germplasm lines of chickpea against root-knot nematodes

(Mallikarjuna, J.)

A total of 69 promising germplasm lines of chickpea received from PC cell, AICRP (N), IARI New Delhi were screened against *Meloidogyne incognita* in pot culture studies. Among them, six were moderately resistant and remaining were susceptible to root-knot nematode.



In vitro screening of chickpea against root knot nematode

Reaction of wheat germplasm/cultivar to pink stem-borer

(K. C. Sharma, Mallikarjuna, J., Yogesh Yele)

Forty-eight wheat germplasm and 20 cultivars were screened against pink stem borer, *Sesamia inferens*. The pink stem borer infestation among germplasm ranged from 1.82 (NIAW34) to 14.15 (DBW71) per cent while the infestation ranged from naught (WH147) to 17.29 (HD 2160) per cent in cultivars. Wheat variety WH147 and germplasm NIAW34 were found resistant against pink stem borer.

Field evaluation of Silicon against wheat pink stem-borer

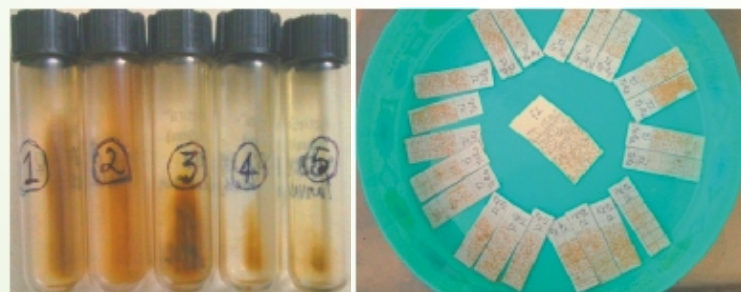
(K. C. Sharma, Mallikarjuna, J., Yogesh Yele)

The effect of different levels of K and silica (*via* soil and foliar) has been studied on the infestation of pink stem borer in wheat (Var. GW273) indicated that plots received K₆₀ + Foliar Si @ 4 ml/l recorded minimum white ear (14%).

Kairomonic activity of extracts of rice yellow stem-borer and its by-products

(R. K. Murali Baskaran, K. C. Sharma)

Host insects produce characteristic hydrocarbons, fatty acids and proteins which stimulate natural enemies to intensify their search in the near vicinity of the host. Various hexane extracts of yellow stem-borer and its by-products were evaluated during first fortnight of April 2017, in a choice test under *in vivo* to study their kairomonic efficiency in enhancing the foraging activities of *Trichogramma chilonis* and *T. japonicum*. Hexane washed and untreated eggs were used as negative and positive check, respectively. The parasitization rate of *T. chilonis* was enhanced from naught to 12.34%, 6.80 to 65.44% and 11.66 to 87.84% on 3rd, 5th and 7th day after exposure to parasitoids, respectively when eggs were treated with hexane extract of whole body female yellow stem-borer (1000 ppm) while they were naught to 10.94, 11.66 to 77.30% and 15.02 to 95.96% for the same period of exposure in *T. japonicum*.



1. YSB female extract;
2. YSB male extract;
3. YSB female wing scale extract;
4. YSB egg wash;
5. YSB larval extract

Choice test to screen hexane extracts of YSB and its by-products against *Trichogramma* spp.

Detection of chemical profile in yellow stem-borer and damaged rice plant (R. K. Murali Baskaran, K. C. Sharma)

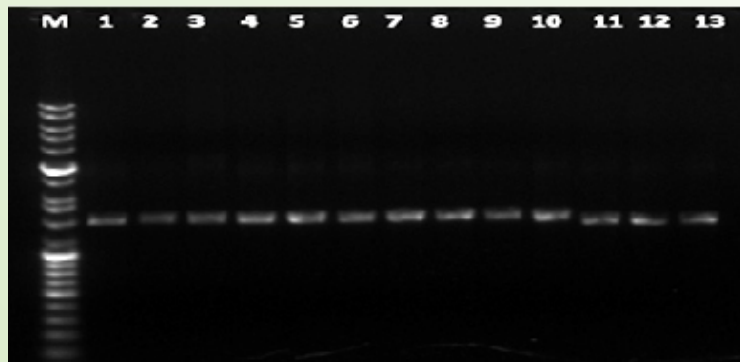
Different chemicals including fatty acid like n-hexadecanoic acid, few alkanes like decane, tridecane, tetradecane, octadecane, eicosane, hexatriacontane, tritetracontane and tetratetracontane from whole body female extract of yellow stem-borer and β -Pinene, α -Pinene and Caryophyllene from yellow stem-borer damaged plant were detected through GC-MS analysis. The chemicals detected from host insect might be responsible to favour in enhancing the parasitization rate of *T. chilonis* and *T. japonicum*.

Viral diseases of crop plants in the plain zone of Chhattisgarh (P. N. Sivalingam, K. C. Sharma, Vinay Kumar, P. Mooventhan)

During the reporting period, surveys were conducted in the farmers' field of fifteen districts covering plain and northern region of Chhattisgarh; Raipur, Durg, Bemetara, Kabirdham, Mungeli, Bilaspur Baloda Bazar, Janjgir-Champa, Raigarh, Masamund, Korba, Koriya, Surajpur, Sarbuja, Jashpur, to understand the prevalence of viral diseases in agriculturally important crop plants. Mung bean, urdbean, cow pea, dolichos bean and pigeon pea were found to be affected with 7-94% yellow mosaic disease, vegetable crops such as okra (91-100% yellow vein mosaic and 78-100% leaf curl disease), chilli (17% leaf curl disease) sponge gourd (78-98% leaf crinkle disease), bitter gourd (52-100% leaf crinkle and 43% mosaic disease), papaya (mosaic and leaf curl disease) were found likely to be infected with whitefly transmitted Begomovirus. Other viral diseases such as leaf crinkle disease in mung bean (98%), ring spot disease in papaya (97%) and mosaic disease in cucumber (3%) were also noticed in this region. Pulses and vegetables crops found to be affected by viral diseases. The important viral diseases found in these areas are mung bean and urdbean yellow mosaic followed by leaf crinkle disease, dolichos bean-yellow mosaic, tomato-leaf curl and spotted wilt, chilli leaf curl, okra yellow mosaic, cucumber-mosaic, sponge gourd, bitter gourd, ridge gourd-leaf crinkle and curl, papaya ring spot and curl diseases.

Bacterial endophytes of pigeon pea and lathyrus (Vinay Kumar, Lata Jain)

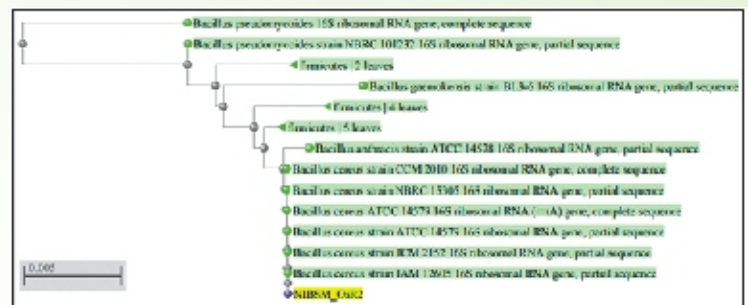
Endophytes are microorganisms which live symbiotically with almost all varieties of plant and in turn helping the plant in a number of ways. A total of 34 bacterial endophytic microbes isolated from pigeon pea (20) and lathyrus (14) were further characterized on the basis of colony morphology, Gram's staining, bacterial morphology (shape *i.e.*, rod, cocci, coccobacilli *etc.*, and size of bacteria) and biochemical attributes namely oxidase, catalase, indole, methyl red (MR), Voges Proskauer (VP) and citrate, urease and triple sugar iron tests. It was revealed most of the isolates found catalase positive having ability to convert hydrogen peroxide, the end product of various metabolites and toxin thus protecting the cell from oxidative damage by reactive oxygen species (ROS). Microbes also showed ability to perform nitrification on nitrate and nitrite and production of indole. Molecular characterization of microbes were conducted using amplification of 16S DNA followed sequencing of amplicons showed the identity with *Bacillus cereus*, *Enterobacter cloacae*, *Klebsiella pneumoniae*, *Bacillus Enterobacter* species and *Serratia marcescens*. 16S ribosomal RNA gene sequences of 32 bacterial endophytes were submitted and accessioned at NCBI.



Gel image showing amplicon produced from 16S ribosomal RNA genes of bacterial endophytes

Bacterial endophytes of rice (Vinay Kumar, Lata Jain)

A total of 32 bacterial endophytes isolated were screened for antibiotic sensitivity assay using 14 multispectral antibiotics, among them most of isolates revealed resistance to methicillin. While, most of the isolates were found sensitive to gentamycin, streptomycin, tetracycline and gatifloxacin. Molecular characterization of bacterial endophytes using PCR amplification of 16S ribosomal RNA gene showed significant genetic diversity among the microbes isolated from different tissues and varieties of rice. Sequencing of 16S ribosomal RNA gene amplicon of bacterial endophytes from rice revealed the identity with *Bacillus pumilus*, *Bacillus cereus*, *Bacillus subtilis*, *Enterobacter cloacae*, *Klebsiella pneumoniae*, *Bacillus thermophilus*, *Enterobacter* species and *Xanthomonas sacchari*. Endophytic bacteria were found in all plant parts of rice plant with a significantly higher density in the root, stem and leaves. 16S ribosomal RNA gene sequences of 32 bacterial endophytes were submitted and accessioned at NCBI with Accession Nos; KY927393-KY927399, KY911276; KY930702-KY930716; KY927847-KY927850; KY930332-KY930334 and KY962816. These endophytes can be further explored for their potential role in enhanced crop nutrition and management of different biotic stresses.



BLAST analysis of bacterial endophyte isolated from rice

Super donor for rice bacterial leaf blight (Xanthomonas oryzae) resistance (Vinay Kumar, S.K. Jain, P.N. Sivalingam)

Research programme initiated for the development of super donor of rice for BLB resistance to introgress multiple BLB resistance genes in the local varieties of rice grown in Chhattisgarh. Linkage was established with IRRI, Philippine and ICAR-NRRI, Cuttack for sharing rice germplasm and procured eight lines (seven IRBB BLB resistance genes and IR 24) from Cuttack.

Microbes associated with reproductive biotic stress in bovine (Lata Jain, Vinay Kumar, S. B. Barbuddhe, Mamta Choudhary)

PCR protocol for detection of bovine brucellosis, leptospirosis and IBR from blood samples was standardized. Total genomic DNA was extracted from 240 blood samples collected from cattle and buffaloes from five districts of Chhattisgarh (Dhamtari, Durg, Kanker, Raigarh and Rajnandgaon). PCR was conducted for presence of DNA of these three infectious pathogens. Out of 240 samples, 45 (18.75%), 61 (25.42%) and 48 (20%) samples were positive for brucellosis, IBR and leptospirosis, respectively.

Interactive educational multimedia module on biotic stress management in rice and lathyrus (P. Mooventhan, Anil Dixit, K. C. Sharma, P. N. Sivalingam, V. K. Choudhary)



SMS Portal and Farmers data base - mExtension



Digitalization of technologies

Documentary on mass production of bio-control agents (*Trichogramma*), weedy rice and pheromone technology were completed to produce the bilingual instructional videos. As a part of m-extension initiatives, registration process was completed in Farmer SMS portal (<http://mkisan.gov.in/>) and creation of farmer's mobile number database initiated.

Farmer First Programme

As an initiative, multi-disciplinary research team explored the existing rice fallow pulse cropping system, livelihood pattern, problem identification, priority setting, information need, perceived constraints partners identification and socio-economic profiling of the resource poor farmers. Appropriate and need based interventions on crop, livestock, horticulture and NRM based enterprises selected for dissemination. Rapid Rural Appraisal (RRA) techniques and surveys were used and field level situation explored. Technological gaps, research problem identification and prioritization done with the target group. Technology assemblage on different module completed and need based capacity building programmes organised on different interventions. Totally, ten capacity building programmes were conducted under FFP and 1084 farmers got benefitted from the cluster of five villages.

New Reports of Biotic Stress

New virus-like diseases

(P. N. Sivalingam, K.C. Sharma, Vinay Kumar)

Virus-like diseases were also recorded such as witches broom in *Ziziphus rotundifolia* and *Carissa carandas*. These diseases are likely to be caused by phytoplasma.



Witches broom in *Ziziphus rotundifolia* Witches broom in *Carissa carandas*

Leclercia adecarboxylata from animal clinical case

(Mamta Choudhary)

The nasal swab collected from deep nasal cavity of three-year-old bullock, showing excessive nasal secretion, pulmonary congestions, laboured breathing and partial anorexia was noticed the presence of infection by *L. adecarboxylata* while subjecting it to Matrix Assisted

Laser Desorption/Ionization Time of Flight Mass Spectrometry (MALDI TOF-MS). *L. adecarboxylata* shares characteristics of Enterobacteriaceae; the organism is gram-negative bacilli, oxidase-negative, mesophilic facultative anaerobes.



Collection of sample from nasal cavity of infected animal

Raoultella ornithinolytica from fishes of Chhattisgarh

(B. K. Choudhary)

R. ornithinolytica is a gram negative, non-motile, encapsulated, aerobic bacillus formerly named *Klebsiella ornithinolytica* which was isolated from fish samples of Jagdalpur district (Latitude: 19.083546 N & Longitude: 82.027617 E) of Bastar Plateau Region of Chhattisgarh. This isolate identification was confirmed using biochemically and MALDI-TOF MS analysis done at Nagpur Veterinary College, Nagpur.



New bacterial endophytes in rice (Vinay Kumar)

Bacterial endophytes isolated from rice, characterized using morphological and biochemical and molecular approaches and their efficacy was against the stem rot causing pathogenic fungi *Sclerotium rolfsii* showed variable inhibition of pathogen growth.



Status of Biotic Stress in Crops at Chhattisgarh (2017)

The status of pests and diseases on various agricultural and horticultural crops, prevailed during rabi/summer 2016-17 Chhattisgarh were documented and tabulated hereunder.

Crop	Biotic Stress	Causal Organism	Intensity
Rabi 2016-17			
Wheat	Pink stem-borer	<i>Sesamia inferens</i>	Medium
	Foot rot	<i>Sclerotium rolfsii</i>	Low
Mung bean	Tobacco caterpillar	<i>Spodoptera litura</i>	Low
	Aphids	<i>Aphis craccivora</i>	Medium
	Leaf crinkle	Virus associated disease	42.9%
	Cercospora leaf spot	<i>Cercospora cruenta</i>	Low
	Leaf spot	<i>Cercospora canescens</i>	Low
	Yellow mosaic	<i>Begomovirus</i>	7 to 94%
	Vein necrosis	<i>Tospovirus</i>	16.3%
	Powdery mildew	<i>Erysiphe polygoni</i>	Low
	Anthraxnose	<i>Colletotrichum lindemuthianum</i>	Low
Cowpea	Yellow mosaic virus	Begomovirus	7 to 94%
Dolichus	Yellow mosaic virus	Begomovirus	7 to 94%
Chickpea	Gram podborer	<i>Helicoverpa armigera</i>	Medium
	Wilt	<i>Fusarium oxysporum f.sp. ciceris</i>	Low
	Collar rot	<i>Sclerotium rolfsii</i>	Low
Lathyrus	Thrips	<i>Thrips tabaci</i>	High
Sunflower	Cut worm	<i>Spodoptera litura</i>	Low
	Stem/Collar rot	<i>Macrophomina phaseolina</i>	20%
Okra	Shoot and fruit borer	<i>Earias</i> spp	High
	Whitefly	<i>Bemisia tabaci</i>	High
	Jassids	<i>Amrasca devastans</i>	High
	Yellow mosaic	Begomovirus	91 to 100%
	Leaf curl	Begomovirus	78 to 100%
Bitter gourd	Leaf crinkle	<i>Begomovirus</i>	High
	Red pumpkin beetle	<i>Aulacophora foveicollis</i>	High
	Fruit fly	<i>Dacus cucurbitae</i>	High
Sponge gourd	Leaf crinkle	<i>Begomovirus</i>	78 to 98%
Brinjal	Shoot & fruit borer	<i>Leucinodes orbonalis</i>	High
Tomato	Fruit borer	<i>Helicoverpa armigera</i>	Low
	Wilt	<i>Pseudomonas solanacearum</i>	Low
	Leaf curl	<i>Begomovirus</i>	Low to moderate
	Blight disease	<i>Phytophthora infestans</i>	Moderate
Bottle gourd	Red pumpkin beetle	<i>Aulacophora foveicollis</i>	High
	Fruit fly	<i>Dacus cucurbitae</i>	High
	Mosaic	<i>Cucumber mosaic virus</i>	Low
	Papaya	Ring spot virus	<i>Polyvirus</i>
Summer 2017			
Rice	Yellow stem-borer	<i>Scirpophaga incertulas</i>	Medium
	Brown planthopper	<i>Nilaparvata lugens</i>	Medium
Chilli	Leaf curl virus	<i>Begomovirus</i>	17%
Bitter gourd	Leaf curl virus	<i>Begomovirus</i>	52-100%
	Leaf crinkle virus	<i>Begomovirus</i>	43%
Lentil	Wilt	<i>Fusarium oxysporum</i>	Low

Institute Activities

4th Institute Management Committee Meeting (March 15, 2017)

The 4th meeting of the Institute Management Committee was held on March 15, 2017 at ICAR-NIBSM, Raipur under the chairmanship of Dr. Jagdish Kumar who briefed about the genesis, mandate and objectives of the institute and emphasized the need of advanced basic research and education in the field of biotic stress management in agriculture. Dr. P. Kaushal presented the progress of on-going research programmes of the Institute and development of infrastructure and stressed the need for effective networking with other institutes.



4th IMC Meeting (March 15, 2017)

Interactive Session (May 16, 2017)

An Interactive Session on 'Utilizing alien species for pigeonpea improvement' was held on May 16, 2017 at ICAR-NIBSM with a motive to update the knowledge and look into the formulation of a research project on the development of podborer tolerant pigeonpea cultivar. The resource persons and committee participated in the afternoon session under the chairmanship of Dr. P. Kaushal and identified the tentative objectives, activities and the role of participating institutes to formulate a research project for external funding.



Collaborations in progress

S. No.	Participating Institutes	Purpose
1.	AICRP networks	Nematodes, other crops
2.	NRRI, Cuttack	Rice pest repository and characterization, pyramiding and stacking of genes in rice
3.	IIVR, Varanasi	Germplasm screening for biotic stress tolerance Interspecific hybridization Developing differentials sets
4.	NIASM, Baramati	Stress tolerance/Stress tolerance/(core) germplasm collections Interspecific hybridization Nano-biosensors for stress induced molecules
5.	NBPGR, New Delhi	Screening for biotic tolerance in core collections
6.	IARI, Pune	Collection of virus and vectors, alternative hosts, molecular virology
7.	MANAGE, Hyderabad	mExtension for technology transfer
8.	IARI, New Delhi NAU, Gujarat TNAU, Coimbatore	Introgression of alien genes for enhanced pigeon pea resistance/tolerance to pod borers

Republic Day

ICAR-NIBSM celebrated Republic Day on January 26, 2017.



Farm Raising Day (June 15, 2017)

ICAR-NIBSM celebrated Farm raising day on June 15, 2017. Director and Joint Director (Research) completed the rituals by lighting up of incense sticks and coconut breaking. Nurseries for rice varieties including Mahamaya, Swarna, MTU 1010 and IR 64 were raised in field no. 42.



International Day of Yoga (June 21, 2017)

ICAR-NIBSM celebrated International Day of Yoga on 21-06-2017. The Programme for International day of Yoga was made a successful event at ICAR-NIBSM by inviting two invited eminent experts from Prajapati Ishwariya Bramhakumari Vishwavidalaya, Raipur for Lecture and performing meditation and Raj Yoga for better health. C o m m o n Y o g a Protocol published by AAYUSH Ministry, GoI, was circulated to all staff members of the institute as ready reckoner for practicing yoga in day today life for better health and to reduce stress.



Institute Monthly Seminar

- Dr. P. N Sivalingam delivered a seminar on 'Mechanism of Interaction of Biotic and Abiotic Stresses in Plants and Cross Tolerance' on February 25, 2017.
- Dr. Mallikarjuna, J. presented a seminar on 'RNAi in Insect Pest Management' on June 18, 2017.

Extension and Outreach Activities

Mera Gaon Mera Gaurav Programme

The scientists provided information to the farmers of selected villages on technical and other related aspects in a time frame through personal visit, demonstrations and meetings every month or on mobile advisory and literature support. The selected villages (15) were visited 29 times repeatedly in 17 visits and benefitted 578 farmers. Twenty five farmers' meeting have been organized in which 173 participated and benefitted. Seven demonstrations were organized in which 57 farmers participated.



Training to Diploma course for Agricultural Extension Services (DAESI)

Pesticide dealers of Raipur were explained about biotic stress management in rice and pulses eco-system by Dr. K. C. Sharma, Dr. P. N. Sivalingam and Dr. V. K. Choudhary on July 03, 2016 under SAMETI programme. A total of 40 input dealers were trained under Diploma course for Agricultural Extension Services on insect pest, weed and rodent management in crops by Dr. R. K. Murali Baskaran and Dr. V. K. Choudhary and Zoonoses by Dr. Lata Jain on January 12, 2017 at NIBSM.



Two-day workshop under Farmer FIRST Programme (FFP)

Two days workshop on Farmer FIRST Programme was held on January 18-19, 2017 at NIBSM under the chairmanship of Dr. S. Prabhu Kumar, Former Director of ATARI, Zone I & VIII. The chairman of the workshop has explained the genesis, concept, objectives and expected outcome of the Farmers First Programme in his deliberation of the workshop. All the sarpanch and village representatives discussed their village problems at length and urged the scientists for overall development of the area through FFP.



Farmers-Scientists interface under Farmer FIRST Programme

As a part of two days workshop, a Farmers-Scientists interface meeting was organised in the remote tribal village (Kharaha) of Kasdol tehsil, Baloda Bazar district on January 19, 2017 under Farmer FIRST Programme. More than 120 tribal farmers participated and interacted with scientists. Interestingly, the woman tribal farmers expressed their willingness to adopt the recommended intervention under rice fallow pulse cropping system. Further, the tribal woman folk expressed to take up enterprise based interventions such as



goatery, backyard poultry, mushroom production and bee keeping.



Rashtriya Krishi Mela, Chhattisgarh (January 27-31, 2017)

ICAR-NIBSM participated and erected a stall at "KRISHI SIMRIDDI" Rashtriya Kisan Mela during January 27-31, 2017 at Raipur, Chhattisgarh. NIBSM displayed various eco-friendly technologies and self explaining posters to mitigate biotic stresses such as sex pheromone and light traps, mass culturing techniques of *Trichogramma* spp. and *Trichoderma viridi* along with the presentation of arthropod biodiversity in this region including beneficial insects, predators, parasitoids, pest of rice and pulses. More than 6000 visitors benefitted from NIBSM's stall and 891 visitors registered their name and mobile number for future contact.



Workshops/Symposia/Seminars/Trainings organized

- A National Workshop on ISO Methods for detection of *Listeria monocytogenes* and introduction to PFGE during March 16-18, 2017 held at Nagpur Veterinary College, MAFSU, Nagpur, organized by ICAR-NIBSM
- Two-day workshop on Farmers-Scientist interface under Farmer FIRST Project held at NIBSM, Raipur during January 18-19, 2017, organized by ICAR-NIBSM
- One day Interactive Session on 'Utilizing alien species for pigeonpea improvement on May 16, 2017, organized by ICAR-NIBSM

Workshops/Symposia/Seminars/Trainings attended

- **Dr. B. K. Choudhary** attended a National workshop on "ISO Methods for detection of *Listeria monocytogenes* and introduction to PFGE analysis" held at Nagpur Veterinary College on April 18, 2017, held at ICAR-Indian Institute of Soybean Research, Indore (M.P.).
- **Dr. V. Kumar** attended i) National Conference on Intervention of Climatic Change in Sustainable Development of Agriculture, Food and Nutrition Security and its Amelioration during March 24-25, 2017 held at Swami Vivekanand Subharti University, Meerut ii) Second Workshop of Nodal Officers of KRISHI-Knowledge Based Resources Information Systems Hub for Innovations in Agriculture (Management of ICAR Research Data Repository for Knowledge Management initiative during January 24-25, 2017, held at NASC Complex, New Delhi iii) National Conference on Emerging Trends in Agricultural Sciences and its Impact on Sustainable Livelihood on February 25-26, 2017 held at Shobhit University, Meerut.
- **Dr. J. Mallikarjuna** attended XIII Annual Group Meeting of

AICRP Nematodes during February 24-25, 2017 held at Indian Statistical Institute, Kolkata.

- **Dr. P. Mooventhan** attended XIII Agricultural Science Congress 2017 during February 21-24, 2017 held at UAS, GKVK, Bengaluru.
- **Dr. R. K. Murali Baskaran** attended two-day workshop on 'Farmer FIRST Programme' during January 08-09, 2017 held at NIBSM, Raipur.

Training attended

- **Dr. K. C. Sharma** attended two-day e-procurement training during February 22- 23, 2017 at IASRI, New Delhi.
- **Dr. S.B. Barbuddhe** attended Competency Enhancement Programme for Effective Implementation of Training Functions by HRD Nodal Officers of ICAR during February 23-25, 2017 at NAARM, Hyderabad.
- **Mr. Yogesh Yele** attended Professional Attachment Training on off-season population of whitefly and its related aspects in selected locations during November 21, 2016 to February 20, 2017 at NCIPM, New Delhi.

Publications

Research Paper

1. Jeer, M., V. K. Choudhary and Anil Dixit. 2017a. Field efficacy of new pre-mix formulation of Flonicamid 15% + Fipronil 15% WG against major insect pests of Rice. *Journal of Entomology and Zoology Studies* 5(3): 679-685.
2. Jeer, M., V. K. Choudhary and Anil Dixit. 2017b. Effect of pre-mix combination of Acephate and Imidacloprid on insect pests of rice and their natural enemies. *Journal of Entomology and Zoology Studies* 5(3): 1272-1278.
3. Murali Baskaran, R. K., K. C. Sharma and Jagdish Kumar. 2017. Seasonal and relative abundance of stem-borer and leaf-folder in wet land rice eco-system. *Journal of Entomology and Zoology Studies* 5(2):879-884.

Repository Deposition

1. Kumar, V., L. Jain, S. Chaturvedi, S. K. Jain and P. Kaushal. 2017. Isolation and characterization of bacterial endophytes from rice (*Oryza sativa* L.) <https://www.ncbi.nlm.nih.gov/Genbank/update>
2. Kumar, V., L. Jain, S. Chaturvedi, S. K. Jain and P. Kaushal. 2017. *Bacillus stratosphericus* strain NIBSM_OsG4 16S ribosomal RNA gene, partial sequence. Accession No: KY962816 available at: <https://submit.ncbi.nlm.nih.gov>

Guest Lectures/Radio Talk

1. Anit Dixit. 2017. A special lecture on Integrated weed management for managing biotic stress to farmers on March 03, 2017, organized by Central Integrated Pest Management Centre, Raipur
2. Anit Dixit. 2017. A special lecture on Integrated weed management for pulses production to farmers on March 28, 2017, organized by KVK, Rajnandgaon and College of Horticulture, IGKV, Raipur
3. Kumar, V. 2017. Presented A special lecture on Introduction to molecular techniques for detection of food-borne pathogens in the workshop on ISO methods for detection of *Listeria monocytogenes* and introduction to PFGE analysis during March 16-18, 2017 held at Nagpur Veterinary College, Nagpur
4. Sharma, K. C. 2017. A special lecture on Major insect pests of Chhattisgarh and their management to Agricultural Input Dealers on January 04 & 12, 2017, organized by State Agriculture Management and Extension Training Institute (SAMETI), Raipur.
5. Sivalingam, P. N. 2017. A special lecture on Diseases of important agricultural crops and their management to Agricultural Input Dealers on January 04, 2017, organized by SAMETI, Raipur.
6. Sivalingam, P. N. 2017. A special lecture on Scientific research

paper writing to under graduate and post graduate students of biotechnology on April 13, 2017 at Amity Institute of Biotechnology, Raipur.

Awards/Recognition/Membership in Professional Societies

1. Dr. Mallikarjuna, J., Scientist (Agric. Entomology) received Best Poster Award from Nematological Society of India at ICAR-CCARI Goa held during January 13-16, 2017
2. Dr. Vinay Kumar, Scientist (Agric. Biotechnology) received Young Biotechnologist Award from Society for Scientific and Social Development, Meerut held during February 25-26, 2017.



3. Dr. Lata Jain, Scientist ICAR-NIBSM was Conferred with IAAVR Merit Award-2017 during the occasion of 17th Indian Veterinary Congress and XXIV Annual conference of IAAVR & National symposium held at ICAR-Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh during April 08-09 April, 2017.



DIGNITARIES VISITS

- Dr. Kuldeep Singh, Director, NBPGR, New Delhi visited on March 01, 2017
- Dr. Prabhu Kumar, Former Director of ATARI, Ludhiana, Punjab visited and chaired two-days workshop in Farmer First Programme at NIBSM during January 18-19, 2017

JOINING / RELIEVING

- Dr. P. N. Sivalingam, Senior Scientist (Agricultural Biotechnology) has taken over the charge of Drawing and Disbursing Officer, ICAR-NIBSM, Raipur on March 21, 2017
- Dr. V. K. Choudhary, Scientist (Agronomy) was transferred to the Directorate of Weed Science Research, Jabalpur and relieved on March 31, 2017
- Dr. S. B. Barbuddhe, Principal Scientist (Veterinary Public Health) was transferred to ICAR-NRC Meat on May 31, 2017

ICAR-Short course

A 10 days ICAR sponsored short course on 'New Frontiers in biotic stress management for doubling farmers income' is going to be organized (11-9-2017 to 20-9-2017) at ICAR-NIBSM, Raipur.