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ICAR-IIFSR



Newsletter

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Director's Message

Needs for qualitative life including quality food envisions dramatic changes in agricultural research outputs. The major issues concerning the marginal and small farm holders in India would be decreased availability of manpower, increased wages, environmental pollution etc. The long term vision to address the ever changing needs should aim to develop a farm household in holistic manner by developing freedom from external resources such as market dependency especially for inputs and labour. The challenges and constraints such as growing population, increasing food, feed, fodder and fuel needs, natural resource degradation, climate change, marginal growth rate in farmer's income and new global trade regulations demand a paradigm shift in shaping future agricultural research programmes in a sustainable and climate resilient integrated farming systems mode. Know your farm, know your producer, know your food will be prevailing in the marketing of outputs of a farm in the time to come and the farming systems research should focus on multi-commodity market oriented farming systems with major focus on organic production practices.



The emerging scenario necessitates complete transformation of research from supply driven IFS models to demand driven consumer specific models with proactive, novel, and innovative research approach based on cutting edge technologies.

The naturally integrated traditional farming systems were more sustainable, but their productivity and profitability is not in pace with growing demand especially due to increasing population pressure. This called for planned intensification and diversification of existing farming systems to ensure the long term productivity and sustainability. Optimization of various agricultural components in resource constraint production environment is essential. Under the aegis of AICRP on IFS and NPOF, around 42 on-station IFS models and district specific on-farm farming system's refinement have been taken up by the Institute. The production and income from these models gives scope for improving the farmer's income by at least 2-3 times than existing. Although, several practical achievements have been made in the form of farming systems management, still science needs to be incorporated in the models by understanding the positive, negative and neutral interactions among the components.

J.P. Singh

Dr. Jag Pal Singh taken over the charge of Director (Acting), IIFSR

Dr. Jag Pal Singh, Principal Scientist (Agronomy) and Programme Facilitator AICRP-IFS took over the charge of Director (Acting), ICAR-Indian Institute of Farming Systems Research, Modipuram, Meerut on 31.01.2015. Dr. Jag Pal Singh has more than 33 years experience in the field of research in various capacities. He is continuing as Programme Facilitator of Network Project on Integrated Farming System Management of AICRP-IFS since 2005. He is the key architect for developing integrated farming system model for small farmers of Western U.P. He has handled five on station projects as Principal Investigator, four On-Farm research and development projects as PI/In-charge and one network project (AICRP-IFS) as Programme Facilitator. There are more than 110 publications in his credit. He is life member of various prestigious societies i.e. Indian Society of Agronomy, Farming system Research and Development Association (FSRDA) and Society of Recent Development in Agriculture.

ICAR-IIFSR

The Indian Institute of Farming Systems Research (IIFSR), Modipuram, Meerut, attained the status of a full-fledged institute of ICAR w.e.f. 27th November, 2014 from its former Project Directorate for Farming Systems Research (PDFSR). The goal and mandate of the institute were revised as per new challenges and responsibilities in farming system's research. Presently the ICAR-IIFSR is running with 4 divisions i.e. Integrated Farming System Management (IFSM), Cropping System and Resource Management (CSRSM), Organic Agriculture Systems (OAS) and Technology Transfer and Human Resource Development (TTHRD). AICRP on IFS with 75 centres and Network project on Organic Farming (NPOF) with 20 centres across the Country are also, the integral part of institute.

Mandate

- To undertake basic and strategic research in integrated farming system on production technologies for improving productivity and resource use efficiencies,
- To develop efficient, economically viable and environmentally sustainable integrated farming system models for different farming situations,
- To undertake on-farm testing, verification and refinement of system-based farm production technologies,
- To undertake human resource development and capacity building in integrated farming system,
- To act as a repository of information on all aspects of farming system's research and development,
- To coordinate and monitor integrated farming system's research in the country.

ICAR-IIFSR accredited ISO 9001:2008 certified Institution

With its excellent quality management systems for research and extension of Integrated Farming Systems for the farming community and other stakeholders, the Indian Institute of Farming Systems Research (IIFSR), Modipuram, Meerut, bestowed with ISO 9001:2008 Certificate by GERMAN CERT on 13th February, 2015 with certificate No.KorQ-153817.



66th Republic Day celebrated

The 66th republic day was celebrated on 26th January, 2015 by the institute. All the employees participated in the function. The programme was started by hosting Tricolour and rendering salute to it by the Director and staff of the Institute. It was followed by National Anthem and address of the Director. In his address, Director Dr. B. Gangwar highlighted the achievements of the institute during past year and set a new target for institute and employees to serve the nation through our new research agenda in the arena of integrated farming systems.

Farm advisory services

Institute have extended the farm advisory services as and when needed by the farmers. Thousands of farmers and visitors of the region were provided appropriate technological inputs in the field of weather forecasting and crop planning, horticulture, crop management, mushroom production, poultry, fishery, livestock production and management etc. in a farming system perspective.



राजभाषा कार्यान्वयन समिति (रा.का.स.) की बैठकें एवं हिंदी कार्यशालाओं का आयोजन

संस्थान में हिंदी के प्रयोग को बढ़ावा देने हेतु विभिन्न प्रकार के प्रोत्साहन कार्यक्रमों का आयोजन किया गया जिनके विवरण निम्न प्रकार है:

- (क) रा.का.स. की प्रथम त्रैमासिक बैठक दिनांक 18. 02.2015
- (ख) हिंदी कार्यशाला का आयोजन दिनांक 30.03.2015
- (ग) रा.का.स. की द्वितीय त्रैमासिक बैठक दिनांक 26.05.2015
- (घ) हिंदी कार्यशाला का आयोजन दिनांक 09.06.2015



कृषि प्रणाली आलोक, तृतीय अंक-2014 का प्रकाशन

संस्थान द्वारा प्रकाशित राजभाषा पत्रिका "कृषि प्रणाली आलोक" के प्रस्तुत अंक में कृषि के बहुआयामी ज्ञान को सरल हिंदी में लिखे गये लेखों के माध्यम से समाहित किया गया है, ताकि कृषि ज्ञान के आलोक का सम्यक प्रसार हो सके। लोकप्रिय लेखों एवं कविताओं के अतिरिक्त पत्रिका में कृषि से संबंधित कुछ उपयोगी अंग्रेजी शब्दों के हिंदी रूपांतर का भी समावेश किया गया है, ताकि पाठकों हेतु पत्रिका अधिकाधिक उपयोगी साबित हो सके।



Meetings/Workshops

28th IRC Meeting held on 24th June, 2015

The 28th meeting of the Institute Research Committee (IRC) was held on 24th June 2015 at ICAR-IIFSR, Modipuram, Meerut. The meeting was chaired by Dr J.P. Singh, Director (Acting). Dr. Birhm Prakash, Director, ICAR-Central Institute for Research on Cattle (CIRC), Meerut was an external expert in the Meeting. Dr. N. Ravishankar, Member Secretary, of IRC presented the brief achievements of the PME cell and action taken report of preceding year. He informed that during past years, five technologies generated by the institute namely bio-intensive cropping systems, integrated farming system model for western plain zone, package of practices for organic production of crops in cropping system, nutrient management for maize-potato-onion system and conservation agricultural practices for wheat in rice-wheat system, have been included in the NRM technologies brought out by the ICAR. Further he informed that a special lecture was also organized on IPR related issues in organic/integrated farming systems by inviting external expert. Director briefed the house that every project should be in farming systems perspective to achieve the set goals of the Institute. Small farmers and the need of their existing farming systems need to be kept in mind while designing the new research programmes.



Technical Programme Review Workshop of AICRP on Integrated Farming Systems (18-19 May, 2015)

Contributed by: **Dr. N. Ravisankar**

To review and reorient the technical programme of AICRP-IFS On-station research programmes, a review workshop was held during 18-19 May 2015 at ICAR-IIFSR, Modipuram. In the workshop, all the Chief Agronomists/ Agronomists/ PIs of AICRP-IFS centres (main/ sub/ voluntary) were invited to participate and all of them participated except from Port Blair (A&N Islands), Chiplima (Odisha) and Maruteru (Andhra Pradesh). The in-house review of on-going experiments was done on 18th May 2015. On 19th May, detailed discussion was held on the on-going technical programme of AICRP-IFS centres. The session was chaired by Dr. I.P. Abrol, Former DDG (NRM) & Chairman, RAC of ICAR-IIFSR and co-chaired by Dr. A.K. Sikka, DDG (NRM). Dr. B. Mohan Kumar, ADG (AAF & CC), Dr. Muneshwar Singh, Project Coordinator (LTFE), ICAR-IISS, Bhopal, Dr.. S.K. Sharma and Dr. B. Gangwar, former Directors, ICAR-IIFSR participated in the meeting as invited experts. The discussion was focused on reorientation of experiments in farming systems perspective including the concepts of diversification, resource recycling and conservation, system sustainability and organic farming.



Group Meeting of OFR Agronomists and Economists (28–30 May 2015)

Contributed by: **Dr. Harbir Singh**

A Group Meeting of the on-farm research (OFR) Agronomists and Economists was organized by ICAR-IIFSR at Modipuram during 28–30 May 2015. In his welcome address, Dr. J. P. Singh, Director, remarked that, characterization is one of the main mandate of the institute and top priority will be given to farming system characterization. The inaugural session was chaired by Dr. S. K. Sharma, former Project Director, PDCSR. He underscored the need for study of the whole farm surroundings for the success of on-station and on-farm research. Dr. B. Mohan Kumar, ADG (Agronomy, Agroforestry & Climate Change), ICAR, New Delhi was the Chief Guest during the session on 30 May 2015. He observed that farming system approach has not received due emphasis in the past, and there is urgent need to undertake recurrent surveys to assess farming system scenarios in the country. In all, 24 OFR agronomists and 7 economists working on the on-farm research (OFR) centers of AICRP on IFS participated in this meeting.



NPOF New Centres Meeting on 24-25 April 2015

Contributed by: Dr. N. Ravisankar

A meeting of seven new centres of Network Project on Organic Farming (NPOF) was conducted at ICAR-IIFSR, Modipuram during 24-25 April, 2015 to discuss and finalize the technical programme. Dr. J.P. Singh, Director (Acting) in his opening remarks, pointed out that, the organic farming experiments needs to be planned in farming systems perspective to take care of minimum or no use of external inputs from the market. PIs of the individual centres presented their technical programme in details and it was finalized after a thorough discussion in the house.

Kisan Goshthi/ Mela

Contributed by: Dr. Anil Kumar and Dr. B.K. Sharma

A *Kisan Goshthi* was organized at Kailawara village of Khatauli block in Muzaffarnagar district on 3rd March, 2015 by the institute, in which 100 farmers of the village participated. The *Kisan Goshthi* was culminating event of 10 days survey conducted in the village to identify the prevailing farming systems of the area and to assess the farming situations. The *Kisan Goshthi* was attended by the Director, IIFSR Dr. J.P. Singh, NAARM Coordinator Dr. S.K. Som, Agronomist Dr. M.P.S. Arya of IIFSR, Veterinary scientist Dr. Naimi Chand of CIRC, Meerut and plant pathologist Dr. Chandra Bhanu of IIFSR. The farmers of the village discussed their farming system constraints with the subject matter specialists. The expert scientists answered the queries of the farmers and provided appropriate guidance to them to overcome constraints. On this occasion the Director IIFSR, Dr. J. P. Singh assured all possible technical help to the farmers of the village



in order to make their farming system more sustainable. The *Goshthi* was quite effective in confidence building among the farmers in order to carry out future programmes.

ICAR-IIFSR stall as key attraction for farmers in *Kisan Mahotsav*

A three days *Kisan Mahotsav* was organized by *Dainik Jagaran* from 31 March – 2 April, 2015 at Mandi Samiti Ground, Sardhana, Meerut. Dr. J.P. Singh, Acting Director, ICAR-IIFSR inaugurated the function as chief guest. ICAR-IIFSR also displayed its technologies in the *Mela*. Dr. Dushyant Mishra and Dr. Chandra Bhanu represented the institute during this *Mela*. The ICAR-IIFSR stall was one of the main attraction points for farmers participated in the programme.



सरथना के मंडी समिति मैदान में किसान महोत्सव का उद्घाटन करते भारतीय कृषि प्रणाली अनुसंधान संस्थान (आइआइएफएसआर) के निदेशक डा. जेपी सिंह व रंगारंग कार्यक्रम प्रस्तुत करते स्कूली बच्चे। जागरण

किसान महोत्सव का रंगारंग आगाज



संस्थान : मंडी समिति ग्राउंड सरथना में भागलवार दोपहर दैनिक जागरण के किसान महोत्सव का रंगारंग आगाज हुआ। कृषि और पशुपालन से जुड़ी विज्ञान और शंका लेकर बड़ी संख्या में किसान महोत्सव में शरीक हुए। महोत्सव में लगे स्टालों पर कृषि वैज्ञानिकों और किसानों को खेलों और पशुपालन से संबंधित महामंत्र दिए। किसानों के लिए दैनिक जागरण की इस पहल का महोत्सव में पहुंचने वाले प्रत्येक व्यक्ति ने मुक्त कंठ से प्रशंसा की।

महोत्सव का शुभारंभ भारतीय कृषि प्रणाली अनुसंधान संस्थान (आइआइएफएसआर) के निदेशक डा. जेपी

- मंडी समिति ग्राउंड में कृषि और पशुपालन से जुड़ी जानकारी दी गई
- किसानों ने मुक्त कंठ से की दैनिक जागरण की पहल की प्रशंसा

सिंह ने फीता काटकर और मां सरस्वती की प्रतिमा के समक्ष दीप प्रज्वलित करके किया। दैनिक जागरण के हिट्टी रीजनल मैनेजर मार्केटिंग संजीव श्रीवास्तव ने मुख्य अतिथि का बूके देकर स्वागत किया। विज्ञापन प्रबंधक यहल शर्मा ने उन्हे प्रतीक चिह्न भेंट किया। महोत्सव में किसानों के लिए दैनिक जागरण की इस पहल को डा. जेपी सिंह ने खूब सराहा। किसानों से बड़ी संख्या में मेलों में भाग लेकर फायदा उठाने को कहा। क्षेत्र में पहली बार लगे मेलों को लेकर किसानों ने भी काफी उत्साह दिखा। बड़ी

खेती में विविधीकरण से ही खुशहाल रह सकता है किसान : डा. सिंह

सरथना : दैनिक जागरण किसान महोत्सव में मुख्य अतिथि भारतीय कृषि प्रणाली अनुसंधान संस्थान (आइआइएफएसआर) के निदेशक डा. जेपी सिंह ने किसानों को एक से बढ़कर मंत्र दिए। डा. सिंह ने कहा कि वर्तमान में देश में लघु और सीमांत किसानों का प्रतिशत 86 फीसदी है। भविष्य में इसमें और बढ़ोतरी होगी। बड़े किसान और भी कम होंगे। ऐसे में खेती में विविधीकरण ही किसानों के लिए फायदेमंद साबित होगा। काम थूम में भी एक वर्ष में कई

फसल लेकर संपन्न बन सकता है। एक ही फसल पर निर्भर रहने वाले सीमांत और लघु किसान नुकसान झेलते हैं। वर्तमान में किसानों की जो आत्महत्या की घटनाएं सामने आ रही हैं, उसमें भी कहीं न कहीं एक ही फसल पर निर्भर रहना भी है।

प्राकृतिक आपदा के सामने किसान मजबूर हैं। अगर खेती में विविधीकरण इस समस्या को काफी हद तक दूर कर सकेगा। खासकर उत्तर प्रदेश के किसान यह प्रयोग आसानी से

कर सकते हैं। क्योंकि उत्तर प्रदेश में सिंचाई के साधनों की कमी नहीं है। डा. सिंह ने किसानों को खेती से संबंधित कई महत्वपूर्ण टिप्स दिए। उन्होंने भारतीय कृषि प्रणाली अनुसंधान संस्थान के बारे में भी किसानों को विस्तार से जानकारी देते हुए बताया कि यह संस्थान पूरे देश में कार्य करता है। इसके देश में 92 खेद हैं। उन्होंने किसानों को संस्थान में आकर कृषि संबंधित समस्याओं और शंका दूर करने का न्योता भी दिया।

संख्या में किसान महोत्सव में पहुंचे और खेतीबाड़ी व पशुपालन से संबंधित अपनी जिज्ञासा और शंका कृषि वैज्ञानिकों से बातचीत करके दूर की।

रांगारंग प्रस्तुतियां : दैनिक जागरण के किसान महोत्सव में केके पब्लिक स्कूल के बच्चों ने अपनी प्रस्तुति से चार चांद लगा दिए। महोत्सव के शुभारंभ पर स्कूल की छात्राओं ने सरस्वती यचना प्रस्तुत की। इसके

बाद केके पब्लिक स्कूल के बच्चों ने विभिन्न गीतों पर रांगारंग प्रस्तुति देकर महोत्सव में मौजूद लोगों का दिल जीत लिया। सभी बच्चों को अतिथियों ने प्रमाण पत्र देकर हौसला अफजाई भी की।

Research Highlights

Soil C Sequestration Potential of Organic Cultivation of Crops in the Western Himalaya Region

Contributed by: R.S. Yadav; D.K. Parmar*; M.P.S. Arya; V.P. Choudhary; N. Subash; D. Dutta; S. Kumar; N.

Ravisankar and A.L. Meena (*CSK HPKVV, Hill Agril. Res. & Ext. Centre, Bajaura)

Assessment of soil C sequestration potential was made after 10 years of continuous organic cultivation of different crops at HAREC, CSK HPKVV, Bajaura (H.P.). Averaged across different cropping systems, Walkley-Black C stock at 0 – 60 cm soil depth was found 66.3, 51.7 and 40.7 t ha⁻¹ under organic, integrated and chemical management of soil nutrients, respectively. Under the organic system, build-up of Walkley-Black C stock was higher by 28.2 and 63.1 per cent than to integrated and chemical application of nutrients, respectively. Further, Walkley – Black soil C sequestration rate in 0 – 60 cm soil depth under organic cultivation of crops was 1.46 and 2.57 t ha⁻¹ yr⁻¹ as compared to integrated and chemical application of soil nutrients, respectively. Study explicitly revealed that continuous practice of raising the crops organically has good potential to sequester C in the soil to offset the C emissions in the atmosphere.

Bearing behavior of low chilling apple cv. Anna under western plain zone of Uttar Pradesh

Contributed by: Dushyant Mishra; J. P. Singh and Chandra Bhanu

Apple (*Malus domestica*) is a high value fruit crop and is world's number two fruit crop with annual production of 80.80 million metric tons. In recent years due to varietal developments in many fruit crops, the fruit availability period and area expansion under non-traditional regions has increased significantly. Keeping these points in view, an experiment was initiated at experimental farm of ICAR-IIFSR, Modipuram, Meerut with planting of saplings of low chilling apple cv. Anna during March 2014. Saplings of pencil thickness and 15-20 cm length showed profuse vegetative growth after field planting and attained the height of 6 feet

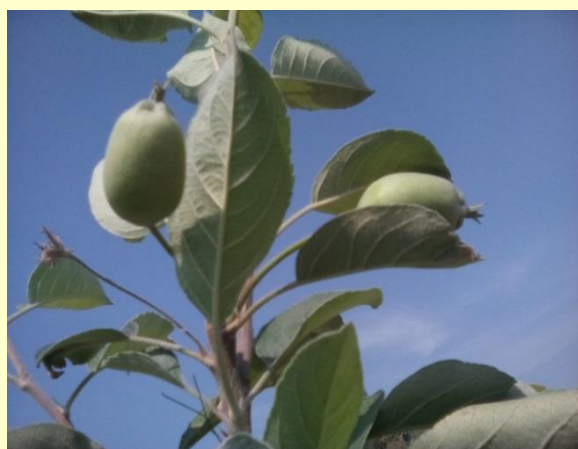


Flowering in Apple cv. Anna

within one year (January 2015). Flower buds (Pink bud stage) were observed during February 2015 to March 2015. Visit of pollinating insects was also observed during this period. There was no plant of any other variety of apples in vicinity but fruit set was observed in plants 15-20 days after pink bud stage. This showed self-fertile nature of flowers. From flower bud emergence to fruit maturity and harvest, it takes 112 days under western plain zones of U.P. and fruit availability period ranged from first fortnight of June to first fortnight of July. Final fruit dimensions were 2.5 inch diameter, 2.4 inch length and average fruit weight as 82g. A total soluble solid (TSS) was observed 17.0⁰ B. No insect or disease was observed on fruits during development period. This preliminary study of bearing behaviour of apple shows bright potential of low chilling apple cultivar Anna under WPZ of U.P. Fruit maturity during June – July can fetch good market price as at that time no apple is harvested from high hilly areas.



Fruit setting stage



Fruit development stage



Fruit at colour development stage

Safer technique for uniform ripening of bael (*Aegle marmelos* Correa.) fruits

Contributed by: Dushyant Mishra; Amit Nath; Pawan Kumar and J. P. Singh

Bael (*Aegle marmelos* Correa.) is a climacteric fruit and it can be ripened after harvesting at physiological maturity state. Normally, fruit traders use calcium carbide as a ripening agent which is a carcinogenic compound and banned by Government of India. Keeping these points in view, a trial was conducted in May-June, 2015 for safe ripening of bael fruits in which, fruits were given six ripening treatments {hot water treatment (60 °C for 5 Minutes) of fruits and storage in CFB box, dipping in ethral solution (2000ppm) for 5 minutes and storage in CFB box, fruit pedicle treatment with cotton soaked swab of ethral (12.5 %) and storage in CFB box, fruit pedicle treatment with lime swab and storage in CFB boxes, fruits kept in straw and packed in CFB box and control} under ambient conditions. After five days of storage, first observation was taken and visual observations showed uniform and 100% yellow colour development on fruits kept with ethral swab, followed by 100% brownish yellow colour development in fruits treated with 2000 ppm ethral, while other treatments showed only light green colour development. Physiological loss in weight (PLW) was also measured and it was non-significant irrespective to treatments. The effect of ethral on ripening and rind colour development was uniform on both the varieties (round and elongated fruit typed). Hence, uniform and early ripening in mature fruits of bael can be induced by placing cotton soaked swab of ethral on fruit pedicle and storing them in 5% ventilated CFB boxes.



Beal fruits before treatment Beal fruits after treatment

Effect of mulching on performance of different potato varieties

Contributed by: Dushyant Mishra, M. P. Singh and Sushil Singh

The study was carried out at the research farm of IIFSR during *rabi* season of 2014-15 to determine the effect of mulching on growth and yield of different potato cultivars. It comprised combinations of three potato cultivars *viz.* Kufri Chipsona 1, Kufri Chipsona 3, Kufri Frysona and two mulching treatments (rice straw mulching and no mulching as control). There was significant effect of mulching treatments on tuber yield of potato. Maximum tuber yield (3.80 kg/M² area) was recorded in Kufri Chipsona 3 with mulching followed by Kufri Chipsona 3 (3.52 kg/M²) without mulching. There was no greening of tubers in mulching treatments, whereas in un-mulched treatments greening problem was observed in some tubers.

Table. Effect of mulching on yield and quality of potato tubers

Variety	Kufri Chipsona 1		Kufri Chipsona 3		Kufri Frysona	
	With Mulch	Without mulch	With Mulch	Without mulch	With Mulch	Without mulch
Tuber yield (kg/M ² area)	3.36	3.10	3.80	3.52	3.40	3.31
Number of total tubers	35	28	40	35	33	31
No of Green tubers	0.00	5.0	0.00	4.0	0.00	5.0

Evaluation of promising sugarcane varieties under sugarcane-ratoon-wheat cropping system

Contributed by: Devendra Kumar

Sugarcane- ratoon- wheat is one of the dominant cropping systems in Western-Plain Zone of Uttar Pradesh, wherein late planting of sugarcane (late April-May) after harvesting of wheat is common practice leading to lower yield in plant crop. Keeping the above concerns in view, a total of 18 newly released sugarcane varieties collected from ICAR-IISR, Lucknow, SBI, regional centre, Karnal and UPCS regional station, Muzaffarnagar, were evaluated at ICAR-IIFSR, Modipuram, Meerut with a view to identify most fit early maturing and high yielding variety in sugarcane- ratoon- wheat cropping system. Planting of sugarcane was done in March, 2014. Nine clones among them were initially short listed on the basis of earliness. The yield data analysed

after completion of crop cycle revealed that, the clones Co 098014 (11.2 tons/ha), Co 0238 (10.05 tons/ ha), Co 0118 (9.6 tons/ ha) and Co Se 03234 were superior in terms of cane yield and brix value in early group. Initial performance of these clones revealed that, these varieties can be used for commercial cultivation in Western-Plain Zone of Uttar Pradesh.

Methane and nitrous oxide emission under different paddy establishment methods and urea application

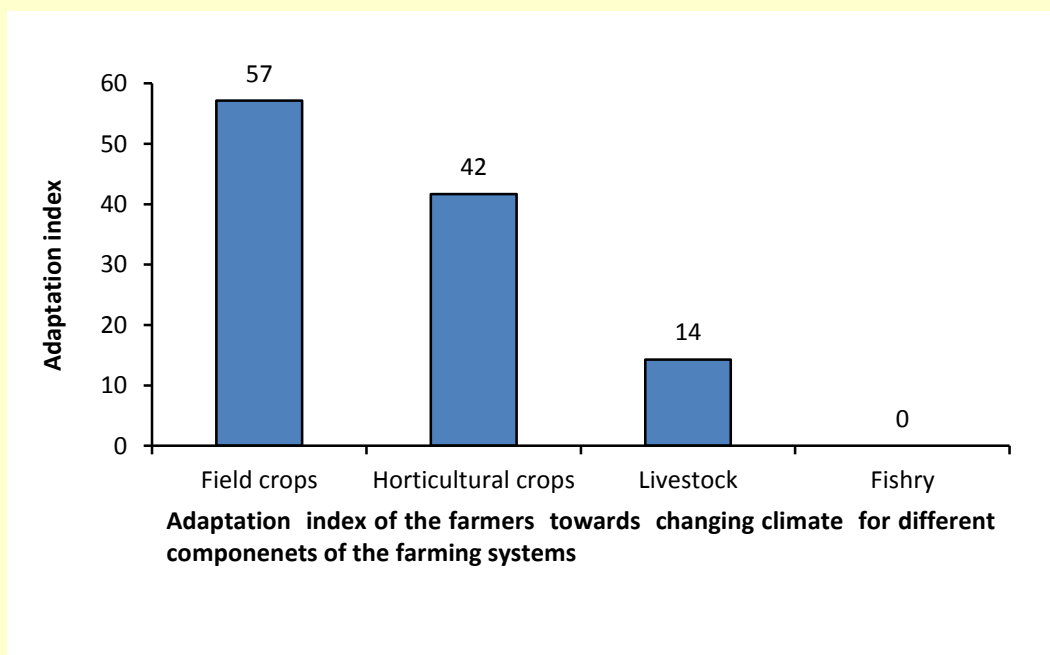
Contributed by: Debashis Dutta; Sanjeev Kumar; R.S. Yadav; M.P.S. Arya; N. Subash; Kiran Rawat; Shweta Singh and A.K. Koshal

Paddy fields are among major source of methane (CH₄) and nitrous oxide (N₂O) emissions which are potent greenhouse gases. To study the emission of methane and nitrous oxide gases from paddy field, a field experiment was conducted with three types of urea (neem coated, sulphur treated and prilled urea) applied in paddy (Variety- PB 1121) planted through direct seeding (aerobic), SRI, drum seeding in wet conditions and conventional method of transplanting. A closed chamber method was used to collect gas from the experimental field. The sample was collected at close interval to estimate the seasonal flux of methane emission and estimated by Gas chromatography (Model-SRI-8610C). Application of Sulphur coated urea, emitted 11.7 kg CH₄ per ha, followed by neem coated urea (12.5 kg) and prilled urea (13.6 kg). Further averaged across the different urea application, direct seeding of dry rice method emitted 11.1 Kg CH₄ per ha, followed by SRI (11.8 kg), wet-drum seeding (12.4 kg) and conventional transplanting (15.1 kg). Similarly, sulphur coated, neem coated urea and prilled urea emitted 0.89 kg, 0.88 kg and 1.06 kg N₂O per ha, respectively. Further, the averaged across the different application of urea, N₂O emission under different paddy establishment method was in order: drum seeding (wet) < direct seeded rice (dry) < SRI <conventional transplanting. It was concluded that, application of slow released nitrogenous fertilizer and adoption of dry seeding of paddy results in less emission of CH₄ and N₂O.

Farmers adaptation towards climate change in Amroha district of Uttar Pradesh

Contributed by: L.R. Meena; Kamta Prasad; M.P.Singh; Suresh Malik; Vinod Kumar; Sanjeev Kumar and B. Gangwar

A base line survey of 60 farmers in Amroha district of Uttar Pradesh was carried out during 2014 under on-farm research programme (OFR). Analysis of data revealed that, farmers are modifying the sowing dates of vegetable crops such as brinjal, cauliflower, bottle guard, sponge guard and turmeric in selected villages as a containment measure. About 92% farmers are adopting short stature and drought resistant varieties of vegetable crops. Vegetable growers in the adopted areas are using 100% plant protection measures against insect-pests and diseases. In the horticultural crops, none of the farmer is doing early harvest and also using net as hail shelter (100%). Only thirty eight per cent farmers are taking care of green fodder for milching animals during dry season. A few number of farmers are using ventilated *Pakka* shelter or electric fans and coolers during summers to protect the cattle. Prophylactic measures in animals are also reported (28%). The highest adaptation index was reported in crops (57%) followed by horticultural crops (42%) and least was reported in fisheries (0%) under changing climatic scenarios.



Status of organic agriculture in Eastern Himalayan Region

Contributed by: Sunil Kumar; N.K. Jat; B.K. Sharma and M. Shamim

A survey was conducted in Sikkim using multistage stratified random sampling method for knowing the status of organic agriculture in eastern Himalayan region. The analysis of the data revealed that out of total farmers, 25, 27.5, 10 and 27.5% in East Sikkim, West Sikkim, North Sikkim and South Sikkim districts, respectively are following organic agriculture. The average productivity of rice and maize was recorded 14.7 q/ha and 10.7 q/ha of organic cultivators, which was much below to the national average productivity of 21.8 q/ha for rice and 14.49 q/ha of maize. On an average, 8.9 animals which include cow, goat, poultry and pigs were noted to be kept by each sample household. The organic materials namely FYM, compost and vermi-compost were recorded to be used by organic growers. Non availability of sufficient organic manure and non-awareness of organic farming was observed among major constraints. The study concluded bright prospect of organic agriculture in the state if, sufficient organic manure is produced by farming community.

Farming systems characterization of Maharashtra

Contributed by: Sunil Kumar; S.P. Singh; Harbir Singh and M. Shamim

Analysis of survey data showed that, cereal based farming system was observed pre dominate in all the regions of the state. Sugarcane followed by crop+ livestock farming systems was major farming system in western Maharashtra. Cereal, livestock and vegetable based farmings were also observed to be followed by farmers of Western region of Maharashtra on large scale and with the resources available with them. Besides, sugarcane and pulses and oilseeds base farming was also prevalent in the region. Pulses and oil seeds followed by livestock based farming systems in Vidarbha region while, pulses and oil seeds followed by cotton based farming systems in Marathwada. The cropping intensity were below 200% in all the regions and cereals constitute major areas of crop production i.e. in Konkan 78% and in Western Maharashtra 47% and sugarcane 35% area. The oil seeds occupies 32%, pulses 17% cereals 24%, and cotton 22% of gross cultivated area in Vidarbha region.

Success story

Family Flower Farming system: A money spinner

Mrs L. Velumani, the farm women because of his son who has desire for profitable farming took the highest risk of complete diversification. After the sudden demise of her husband, she became the family head and took to full time farming. Though she worked in farm, direct involvement in decision making was not there earlier. Her son and daughter in law started giving a helping hand in farming as a full timer. On-Farm Research (OFR) programme under AICRP-IFS located at Regional Research Station, Paiyur (Tamil Nadu) under Tamil Nadu Agricultural University selected Mrs L. Velumani having 1.14 ha in Baisuhalli village in Karimanagalam block of Dharmapuri district in Tamil Nadu for the experiment of “On-farm evaluation of farming system modules for improving profitability and livelihood of small and marginal farmers”. The predominant farming system practiced by her was field crops+ dairy. Due to water scarcity, she grew mainly green gram, groundnut and fodder sorghum. With the available water, she had crops over an area of 1.08 ha and 3 HF cows. She realised a net income of only Rs.55,208 with the investment of Rs.51892 during the bench mark year (2011-12).



Mrs L. Velumani in the flower



Weeding by daughter in law of Mrs L. Velumani

Through OFR team, her family laid drip irrigation system in 0.70 ha with the help of National Horticulture Mission subsidy of Rs.60,000 so as to use the available water judiciously. The tuber rose variety ‘Prajwal’ from ICAR-IIHR was recommended and from sourcing of tubers, planting and maintenance, the family adopted the AICRP on IFS team recommendations. All three members of family involved in forming broad beds and furrows, planting, weeding, earthing up, pest management and plucking. Early morning all the three were there in the field for doing regular field operations and plucking flowers. By 7.00 am, Mr. Suresh, her son drops the fresh flowers to the local transporters to deliver the flowers at Bangalore before 9.30 am. Around 6144 kg of tuberose flowers were harvested in a 7 month period earning Rs.1,57,694 as the net income. She also raised cowpea (Co 6) in an area of 0.20 ha and received a net returns of Rs.8583. She also planted fodder grass in 0.04 ha with CNCO4 to feed her animals. From dairy, she got Rs. 24105 as net return. In total, interventions made in farming systems perspective resulted in additional net return of Rs 1,35,174/year which is 2.5 times higher than the benchmark income.



Family maintained tube rose

Human Resource Development

Special Lecture on IPR

A special lecture on “Intellectual Property Rights issues in Organic and Integrated Farming System Research” was organized at ICAR-IIFSR, Modipuram on 27 March, 2015. Dr. S.K. Soam, Head, Information and Communication Management Division, ICAR-NAARM was lead invited speaker in the programme. He has elaborated the intricacies and minutiae of patenting system and

also indicated for the patent opportunities in organic and integrated farming systems. All the Scientists, Technical Officers and RA/SRF participated in the programme.

Trainings organized for farmers

One day training was organized by the institute on 'Integrated farming systems management' for the farmers of the region on 30.06.2015. A group of thirty farmers participated in the programme. Lectures and practical demonstrations were given to farmers by the experts on farming system components and livelihood security.



International Training/ Workshop attended




Name of participant	Name of the training/seminar/symposia etc. attended
Dr. Amit Nath, Pr. Scientist	International Conference on Technological Intervention in Agricultural Sciences for Enhanced Productivity, Nutritional Quality and Value Addition”, 17-19 th Feb., 2015, Central Institute of Horticulture (CIH), Medziphema, Nagaland.
Dr. N. Subash, Sr. Scientist	5th AgMIP Global Workshop and RRT meeting held at University of Florida, Gainesville, Florida, 28th February - 1st March, 2015
Dr Dushyant Mishra, Sr. Scientist	International training workshop “Approaches for Integrated Analysis of Agricultural Systems in South Asia: field, to farm, to landscape scale” organized by CIMMYT and Wageningen University, Netherlands at ICAR-CSSRI, Karnal, May, 18-20, 2015
Dr. N. Subash, Sr. Scientist Dr. Harbir Singh, Pr. Scientist	AgMIP Phase II Fundamentals workshop held at A'Zambezi Hotel, Victoria Falls, Zimbabwe, 24-30th June, 2015

National Training/ Workshop attended

Name of participant	Name of the training/seminar/symposia etc. attended
Dr. Debashis Dutta, Sr. Scientist	National Symposium on Agrochemicals for Food and Environmental Safety at Div. of Agril Chemicals, IARI, New Delhi, 28-30 January, 2015
Dr. N.K. Jat, Scientist	12 th Agricultural Science Congress on “Sustainable Livelihood Security of Smallholder Farmers” at NDRI, Karnal, Feb 3-6, 2015
Dr. Brij Mohan , ACTO	Designing and Analysis of Experiments, ICAR-IASRI, New Delhi, 20.04.2015- 25.04.2015 (6 days)
Dr. Nisha Verma, Scientist	Transformative approaches in gender mainstreaming,

	gender budgeting and women empowerment in agriculture, ICAR-IIRR, Rajendranagar, Hyderabad, 08.06.2015 to 17.06.2015 (10days)
Dr. V. K. Singh	Silver Jubilee Celebrations and Annual General Body Meeting of the National Academy of Agricultural Sciences, NASC Complex, New Delhi, June, 3-5, 2015
Dr Dushyant Mishra, Sr. Scientist Dr. Nisha Verma, Scientist	Inception workshop on collaborative Network project on Integrated Farming Systems Research for Improvement of Nutrition and Livelihood of farm women under different agro-ecosystems, DRWA Bhubaneshwar, 11.06.2015 - 12.06.2015
Dr. Chandra Bhanu, Scientist	XVII Annual Workshop of All India Coordinated Research Project on Mushroom is planned to be organized at ICAR-Directorate of Mushroom Research, Solan, 29-30 June, 2015

Our New Colleagues

Dr. Peyush Punia, Principal Scientist (Fisheries) joined the Institute on 29.04.2016 after being transferred from ICAR-NBFGR, Lucknow	
Sh. Amrit Lal Meena, Joined as Scientist on 10.04.2015	
Sh. Lalit Krishan Meena, Joined as Scientist on 14.04.2015	

Retirements

Dr. B. Gangwar, Ex. Director, ICAR-IIFSR, Meerut retired on 31-01-2015

Dr. S. S. Pal, Pr. Scientist, ICAR-IIFSR, Meerut retired on 31-01-2015

Awards and Recognitions

1. **ICAR-IIFSR** received third prize for attracting maximum attention of farmers during three days *Kisan Mahotsav* organized by *Dainik Jagaran* from 31 March – 2 April, 2015 at Mandi Samiti Ground, Sardhana, Meerut.



2. **Dr. Dushyant Mishra** was awarded with **SRDA Award** at Central Institute of Horticulture, Medziphema, Nagaland on February 19, 2015 during International Conference on Technological interventions in Agricultural Sciences for Enhanced Productivity, Nutritional Quality and Value Addition. He was also awarded as Fellow of Green Earth Research Foundation (GERF), Lucknow for the year 2014.

3. **Dr. Amit Nath**, Principal Scientist (Food Technology) received **Best Poster Award** as Co-authored in the poster entitled “Design and development of low-cost portable biomass fired dryer and its performance evaluation for drying of large cardamom” during XII Agricultural Science Congress-2015 at ICAR-National Dairy Research Institute, Karnal during 3-6 Feb., 2015.

4. **Dr. N. K. Jat**, Scientist (Agronomy) awarded the “**Young Scientist Award**” by GKV Society, Agra in National Conference on “Reinvigorating Agricultural Innovations for Farmers Empowerment and Development (RAINFED- 2015)” held at PJTSAU, Rajendranagar, Hyderabad during 3-4, May, 2015.



5. **Dr N. Ravisankar**, Principal Scientist was nominated as Focal point expert for the regional consultation meeting on “Status and future prospect of organic agriculture for safe food security in SAARC countries” organized by SAARC Agriculture Centre, Dhaka, Bangladesh

Distinguished Visitors

Honourable Union Minister of State for Agriculture and Farmer's Welfare, Dr. Sanjeev Kumar Baliyan and Hon. M.P. Sh. Bhartendu Singh visited ICAR-IIFSR on 24.03.2015



Dr. Alok Kumar Sikka, Deputy Director General (NRM), ICAR (7th March, 2015)



Dr. B. Mohan Kumar, Assistant Director General (Agronomy, Agroforestry and Climate Change) ICAR (21st February, 2015)

An Ethiopian delegation comprising 10 members led by Dr. Tesfaye Feyisa, Director, Amhara Regional Agricultural Research Institute (APARI) visited ICAR-IIFSR on April 28, 2015



Important Publications

1. Annual Report. 2013-14. AICRP on Integrated Farming Systems, ICAR-Indian Institute of Farming Systems Research, Modipuram
2. Annual Report. 2013-14. Network Project on Organic Farming, ICAR-Indian Institute of Farming Systems Research, Modipuram
3. Annual Report.2014-15. Indian Institute of Farming Systems Research, Modipuram, Meerut

4. Gangwar, B, Kamta Prasad, N. Ravisankar and J.P. Singh (Eds). 2015. Long term integrated nutrient management in cereal based cropping systems, AICRP on Integrated Farming Systems, ICAR-Indian Institute of Farming Systems Research, Modipuram, Meerut p. 416
5. Ravisankar, N., B. Gangwar, Kamta Prasad, Raghuveer Singh and Rajbir Singh (Eds). 2015. Farming Systems Research: Success Stories (Series 1), AICRP on Integrated Farming Systems, ICAR-Indian Institute of Farming Systems Research, Modipuram, Meerut p. 246

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