ICAR IARI-Jharkhand

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Contents

Research Highlights

From Director Desk ....

With immense pleasure, we present our institute's first newsletter, which details the activities of the institute. IARI-Jharkhand was established with the aim to promote excellence, foster high-standard research for holistic agrarian development and orienting the educational programme towards future needs and opportunities. With this goal, our major research highlights from the previous year has been presented. Soil acidity management in wheat, microbe-mediated yield improvement in acidic soils, GIS and GPS based soil mapping of ICAR-IARI Jharkhand research farm, physiological study of maturity in sapota, genetic enhancement of papaya for higher yield, genetic improvement of maize for high yield and quality, optimization of the number of rice seedlings per hill, evaluation of pigeonpea, lentil, mung bean and maize germplasm under rainfed conditions in acidic soil, plant based edible coating of guava, and evaluation of green fodder for dairy animals in Jharkhand has been the major areas of research. Efforts were also focused on germplasm exploration, popularization of hybrid varieties of quality protein maize, and seed production activities by group of scientists in collaborative mode. Besides, several scientific lectures were delivered in online and offline mode during the period. Extension activities, and training programmes were also organized for capacity building of farmers and other stakeholders through on farm visits, guest lectures and distribution of quality seeds.

ICAR-IARI Jharkhand is running its academic programme as a PG outreach institute under the Post Graduate School, IARI New Delhi. During the academic sessions 2020–21, 32 students were admitted to M.Sc./M.Tech. courses in 12 different disciplines.

The team ICAR-IARI Jharkhand has attempted to compile the events and activities of the institute in form of News Letter which is most desirable. I hope that the information presented in the newsletter would be helpful for farmers to enhance their farm productivity and profitability. I would like to thank all of the scientists involve in the publication unit for bringing out the newsletter on the occasion of 8th Foundation Day of the institute.

Ashok Kumar Singh
Director

OSD's Column ....

It is always challenging to start. A lot of hitch in the mind, regarding what to present and what not makes the task more difficult. Nevertheless, at some point of time, it has to happen. Then why not on the occasion when we can retrospect our journey and plan better for future. The time chosen to start this newsletter on occasion of Foundation day is welcome step. I must congratulate the team from my core of heart.

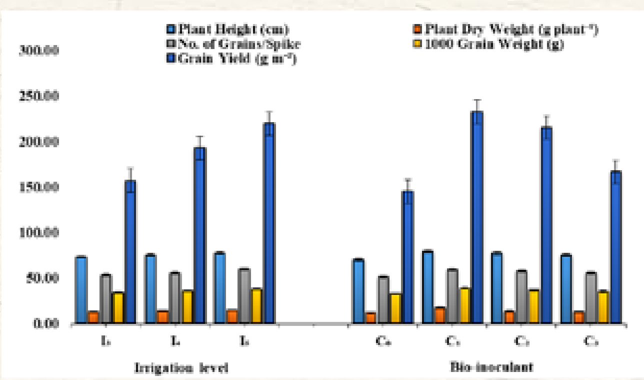
The activities which has been taken so far and the content presented are very basic which always has scope to improve further. With a quote of 'Well begin Half done", I invite all colleagues to share their outcome of research, teaching and extension to enrich the content of Newsletter in coming issues.

Vishal Nath
Officer on Special Duty

Research Highlights

Microbe mediated plant growth and yield improvement of wheat under different irrigation levels in acidic soil conditions

Wheat plant (*Triticum aestivum* L.) is the most important crop and plays a major role in providing food to a large part of the world's population. Water scarcity is the major constraint which affects wheat productivity in eastern India, especially in Jharkhand. For abiotic stress management and increasing crop productivity PGPR (Plant Growth Promoting Rhizobacteria) is one of the eco-friendly, low-cost alternatives which can be adopted. Inoculation of plants with beneficial micro-organisms promotes plant growth and increases drought tolerance. PGPR inoculation in plants promotes growth and increases drought tolerance. Effect of seed inoculation of wheat with selected rhizobacteria (MKS 6, MRD 17 and NRSSS-1) on growth and yield of wheat grown in acidic soil (pH 5.7) was evaluated in combination with three levels of irrigations (5 irrigations; 4 irrigations; 3 irrigations). Bio-inoculum inoculation positively influenced the plant height, plant biomass, no. of grains/spike 1000 grain weight and grain yield of wheat as compared to control without inoculation. Three inoculums showed a variable response in contributing the plant growth and yield of wheat (Fig.) during the period of study.



Influence of bacterial inoculation and irrigation on wheat plant growth and yield attributes

(Himani Priya, Manoj Chaudhary, Ranjit Singh and Priya Ranjan Kumar)

Evaluation of wheat varieties under integrated soil acidity management in Jharkhand

Yield and yield attributing characters of wheat variety (HD3086) were evaluated under integrated soil acidity management practices at IARI research farm, Jharkhand with different fertilizer and soil amendment applications (T1-Control (RDF), T2-RDF+Lime, T3-RDF +Inoculated seed (*Azotobacter*), and T4-RDF+Lime +Inoculated seed (*Azotobacter*)). The data regarding plant height (cm), number of tillers, number of spikes/plant, spike length(cm), 1000 grains weight (g) and grain yield (kg/ha) were recorded during the growth period and after harvesting of the wheat crop. Data revealed that integrated use of chemical fertilizers, lime and biofertlizer (*Azotobacter* strain) had a significant effect on all the parameters over control.

Growth pattern of wheat variety-(HD3086) vis a vis Effect of integrated soil acidity management on the performance of yield and yield attributing characters

(Manoj Chaudhary, Himani Priya, Preeti Singh and Priya Ranjan Kumar)

GIS and GPS based soil mapping of ICAR-IARI Jharkhand Research Farm

An accurate estimation of the spatial distribution of soil properties (physical, chemical and biological) is important in precision agriculture and is one of the basis for making decisions and strategies. Developing spatial distribution maps of different soil parameters will help refine agricultural management practices, as well as provide a base for future management of soil. Therefore, an attempt has been made to prepare GIS and GPS based soil physical, chemical and biological maps for ICAR-IARI, Jharkhand farm to find out the soil fertility-related production constraints in the farm and to suggest remedial measures for optimum production of crops. This data will be useful for conducting research and seed production trials vis a vis studying the long-term effects of different crop management practices on soil properties. Soil samples were collected from the selected area of research farm surface soil (0-15cm) using an intensive grid-point sampling approach. The coordinates of the sample points were taken using Global Positioning System. Soil samples were analysed and soil map was genereted for bulk density, pH, EC, organic carbon, and available NPK, total C,N. Results reveal that research farm had bulk density of 1.48-1.74 g/cm^3, pH 4.52-7.43, EC 0.11-0.54 dS/m, OC 0.12-0.77 %, Avl. N 84-398 kg/ha, Avl. P 2.81-6.81 kg/ha and Avl. K 52-243 kg/ha, total C 0.25-1.22%, total N 0.047-0.13%. Therefore, it can be concluded that the majority of the farm area under the study is poor in soil fertility.

(Preeti Singh, Manoj Chaudhary)

Bajra Napier Hybrid: a potential green fodder for dairy animals in Jharkhand

Jharkhand, an important state in the eastern region of India, possesses a considerable livestock population, representing over 4.39% of the national population (536.7 million heads). But their contribution to national milk production is only 1.16%, indicating lower yields from livestock when compared to the yields and contributions from other states like Punjab, Haryana and Uttar Pradesh resulting into lower availability of per capita milk is also low (177 g/day) in comparison to the national average of 394 g/day. For full exploitation of milk production of dairy animals, it is highly essential that good quality green fodder is made available to them throughout the year. But the fodder supply situation in Jharkhand is extremely precarious and the gap is very wide. A conservative estimate indicated the demand for 26.1 million tons of green fodder against only 2.46 million tons present availability, while the dry fodder supply is to the tune of only 50% of the demand. Thus, the shortage of fodder resources indicated that most of the livestock remained underfed.

Cultivated fodder crops such as maize, bajra, sorghum, berseem, oat etc. are seasonal in nature and could not supply green fodder round the year in adequate quantity. Hence, it is required to cultivate such fodder crops which are perennial in nature and having high green biomass production potential. Bajra Napier grass, which is a hybrid between bajra (Pennisetum glaucum) and napier grass (Pennisetum purpurium), has the characteristics of bajra that is (good palatability and intake) along with perennial nature and deep root characteristics of napier. Indeed, combined characters of high productivity and good palatability makes bajra napier hybrid an ideal fodder crop for round the year fodder production. It contains 7-12% crude protein and 30-35% crude fibre. Once planted, it can give 8-10 cuts in a year and if managed suitably, it can even supply fodder for 5-6 years. Thus, there is considerable saving in cost of production and good returns are reaped as high yield is obtained in shorter periods. Bajra napier hybrid is gaining importance in livestock production throughout the country due to its quick growth, high yield potential, better palatability, digestibility, ratooning ability, resistance to insect-pest and diseases, and adaptability to different soil and climatic conditions. Keeping the above in view, and the scarcity of green fodder for dairy animals at field level, Evaluation of some bajra napier hybrid varieties (IGFRI-10, CO-1, CO-5 and Kamdhenu) was done at Experimental Farm, ICAR-IARIJ, Gauria Karma, Jharkhand and recorded yield potentials of 140 to 200 tons/ha. Since feed alone constitutes about 65-70% of the total cost of milk production which can be reduced to 30-40% by providing these cheap and quality green fodders in Jharkhand.

Performance of Bajra Napier hybrid in Jharkhand

(S.K. Mahanta, Shilpi Kerketta, Manoj Chaudhary and Pankaj Kumar Sinha)

Thin-shelled bael germplasm identified at ICAR-IARI Jharkhand

Bel or Bael (*Aegle marmelos*) is an important indigenous fruit of India and its wild populations are found naturally growing throughout India. Most of the bael genotypes available in the southern part of the country are having small-sized fruits with undesirable traits whereas the diversity available in north India possesses bigger size, good taste and other desirable characteristics. Bael is a nutritious and medicinal fruit plant, which is most suitable to grow in water-scarce areas of the country. The Eastern Plateau and Hill region of India, comprising the states of Jharkhand, Orissa and Chhatisgarh, receives a variable rainfall of 80-150 cm annually, providing congenial climatic conditions for the cultivation of bael fruit on a commercial scale.

Collection and characterization of local germplasm of seedling origin is the prerequisite criteria to design any breeding strategy for the bael improvement program. The work on genetic improvement of bael has been initiated at ICAR-IARI Jharkhand with collection of some improved varieties and local landraces from the eastern part of the country. During the process, a unique germplasm has been identified which is having very thin shell.

Figure: (a) Mature fruit, (b) Ripe fruit, (c) and (d) Fruit cut open through knife

The shell of the bael fruit was observed very thin, intact fruit can be pressed by hand on ripening and the fruit can be cut into halves with a sharp knife (Figure). Preliminary observations of the genotype recorded a fruit weight of approx. 1 kg, size 13.0x16.0 cm, shell thickness 1.8 mm, pulp recovery 74% and pulp TSS 320 Brix. The fruit shape was round with smooth surface and ripe fruit pulp colour orange-yellow with very good taste. Fruit pulp recovery was quite high (70%) and the seed count reported was 58 per fruit inside 11 locules. The tree of the particular genotype was reported to be medium tall with a dense canopy.

(Vishal Nath, Krishna Prakash, Pankaj Kumar Sinha and Dipak Kumar Gupta)

Evaluation of lentil germplasm in acidic soil of IARI, Jharkhand

Lentil is highly sensitive to low pH containing acidic soils. The acid soils are mainly characterized by a deficiency of major nutrients and toxicity of metals, such as manganese (Mn), iron (Fe) and aluminium (Al) toxicity of aluminium has been the main limiting factor for plant growth in acid soils. Aluminum solubilizes at low pH (< 5.0) to release phytotoxic, monomeric Al3+ which is easily absorbed by plants and inhibit root elongation even at micromolar concentrations within a few minutes of exposure. As a secondary effect, deficiency of phosphorous (P), magnesium (Mg) and calcium

(Ca) is induced in shoots due to low pH. One hundred and fourteen genotypes of lentil were evaluated and characterized under acidic soil condition with pH < 5.0, EC 0.11 to 0.21 ds/m and soil organic carbon 0.35% during *rabi* 2020-21. The soil was sandy clay loam with 1.60 g cm^{-3} bulk density and the initial surface soil contained 143 kg ha^{-1} available N, 23 kg ha^{-1} available phosphorus and 144 kg ha^{-1} available potassium.

Each genotype was sown in single row of 2 m length with 23.5 cm spacing. Recommended package and practices were followed. Observations were recorded on yield and its component traits. Twenty-five genotypes showed very poor germination (2-8 plants) per row. The average plot yield of rest 89 genotypes varied from 2.3 g (P-13216 and IG-111996) to 19.8 g (genotype 296/12). The hundred seed weight was noted to be lowest for LC-300-17 and the highest for L-4650. The poor performance of genotypes under low pH clearly indicated high sensitivity of lentil to acidic soils. The experiment has been planned to be repeated further to identify the elite germplasm having tolerance to low pH soil conditions for utilization in breeding soil acidity tolerant high yielding varieties of lentil.

(Anima Mahato, Monu Kumar and Preeti Singh)

Genetic improvement of maize

For the development of QPM+provit. A enriched composite variety, a half-diallel cross was made between ten elite QPM+provit. A enriched inbred lines, procured from ICAR-IARI, New Delhi (Rabi 2020-21). The 45 F1s were raised during Kharif 2021 and again bulk pollination was made to set the seeds. During Rabi 2021-22, open pollination was used to raise the S1 generation.

With the objective to develop high-yielding maize hybrids, 25 inbred lines were procured from SKUAST, Kashmir. Evaluation of these inbred lines were made during Rabi 2020-21 and diversity was studied based on morphological traits. These inbred lines were also crossed with three elite inbred lines BML 6, UMI1200 and LM13 in L X T fashion during Rabi 2020-21 and 75 F1 hybrids were evaluated during Kharif-2021. Four cross combinations recorded higher yield than the check Bio 9544 and P 3304. Additionally 58 elite inbred lines of maize were procured from SKUAST, Kashmir, ICAR-IIMR, Ludhiana and CIMMYT India, Hyderabad, eleven (11) accessions (landraces) from NBPGR, New Delhi and 18 landraces collected from the rural areas of Jharkhand and West Bengal are being used for the breeding purpose and development of crosses as well as new inbred lines. All the procured and collected materials are being evaluated and maintained.

With the objective of identifying high yielding maize hybrids for Jharkhand, 591 (normal and QPM) experimental hybrids from ICAR-IARI, New Delhi and ICAR-IIMR, Ludhiana were procured and evaluated for their yield performance. In the evaluation study, 37 hybrids were found performing better than the best check in terms of grain yield. Among these, nine elite hybrids have already been tested up to the advance stage of AICRP trials and all these nine hybrids were having higher grain yield than the check in the evaluation study. These nine hybrids have to be tested at the different locations of the Jharkhand state for state release.

Baby corn experimental hybrids (26) were also procured from ICAR-IIMR, Ludhiana for evaluation of their baby corn and fodder yield under NEPZ condition.

(Santosh Kumar, Preeti Singh)

Screening of Maize hybrids under acidic soil

Acid soils hinder plant development through deficiencies of P, Ca, Mg, K, Zn, S, and Mo and/or toxicity of A1, Mn, and Fe. More than 8 million ha of acid soils are being utilized for maize in the tropics. Although many of the problems associated with soil acidity can be corrected through amendments but most of the farmers in developing countries cannot afford it. Breeding for acid soil tolerance could provide a less expensive solution which is also permanent and environment friendly. Maize shows considerable genetic variability for tolerance to acid soils. To screen maize for acid tolerance, experiments were conducted at ICAR-IARI Jharkhand. Soil test results of initial soil samples collected from 0 - 15 cm depth reveal pH< 5.5, EC-0.11 ds/m and soil organic carbon < 0.34% along with 121 kg ha^{-1} available N, 5.88 kg ha^{-1} available phosphorus, 174 kg ha^{-1} available potassium having sandy clay loam soil texture and 1.72 g cm^{-3} bulk density. A set of 39 hybrids were evaluated under the above mentioned soil status and it was observed that 11 hybrids outperformed the checks Bio 9544 and P3304 in terms of grain yield. These hybrids have to be tested again to confirm the test result.

Pollination in maize for maintenance of inbred and development of F_1 hybrids

Field view of experimental hybrids

(Santosh Kumar, Preeti Singh, Anima Mahato, Monu Kumar)

Seed production of crops

Seed production of eleven rice varieties (IR 64, Anjali, Vandana, Sahbhagi, Abhishek, PNR 381, Pusa 44, JD 13, PNR 162, PNR 519 and PNR 546) were undertaken during kharif 2020 at ICAR-IARI, Jharkhand. Seed production of green gram, lentil and maize inbred lines as well as hybrids have been undertaken during 2021.

(Priyaranjan Kumar, Santosh Kumar, Monu Kumar, Preeti Singh, Anima Mahato)

AICRP Maize trial

ICAR-IARI, Jharkhand has been included as a voluntary center of AICRP-Maize. A total of four AICRP trials (AVT-I Medium, AVT-II Medium, AVI-I-II-Early, AVT-I-II-Late) were successfully conducted during Kharif-2021. All the trials were appreciated by the AICRP monitoring team and data recorded were included in AICRP maize Kharif report-2021.

Visit of monitoring team of AICRP maize trial

Field view of AICRP Maize trial at ICAR-IARI, Jharkhand

(Santosh Kumar, Preeti Singh)

Characterization of mungbean germplasm under rainfed and acidic soil conditions

Mungbean (*Vigna radiata*) grows best in soils with pH ranging from 6.5 to 8.5, and performs poor at pH 5.5 or less. At a critical soil pH value of <5.5, assimilation of major ions decreases, net H^+ releases and root growth cease. Besides the simple matter of low pH, soil acidity is associated with high availability of Al^{3+}, which is stressful or toxic to mungbean. Acid soil can be managed by the application of lime and the effect of aluminium toxicity can be ameliorated by the use of P-containing fertilizers. However, these options are not available with poor farmers, and they are less effective when cultivars are sensitive. Keeping this in view, screening and characterization of 150 genotypes of mungbean was carried out in acid soil, with pH ranging from 5.0-5.5, EC 0.26 ds/m and soil organic carbon 0.28%, during *kharif* 2021. The surface soil (0–15 cm) properties were as follows 126 kg ha^{-1} available N, 5.31 kg ha^{-1} available phosphorus, 132 kg ha^{-1} available potassium with sandy clay loam soil texture and 1.67 g cm^{-3} bulk density.

Field view of Mungbean trial at ICAR-IARI, Jharkhand

(Anima Mahato, Santosh Kumar and Preeti Singh)

Station trial of mustard

Exploratory trial on mustard has been conducted at ICAR-IARI, Jharkhand with 45 elite advanced lines during 2021-22 out of which four lines were found to have higher yield than the check. The station trial of 41 advanced lines procured from ICAR-IARI, New Delhi were also conducted during 2020-21 repeated during 2021-22 out of which six lines recorded higher yield than the checks.

Crossing in mustard with local collected lines

Field view of station trial of mustard at ICAR-IARI, Jharkhand

Field view of crossing block of mustard at ICAR-IARI, Jharkhand

Eight F_2 materials of mustard were procured from ICAR-IARI, New Delhi during 2021-22. The selections were made by team IARI and the seeds were sent to IARI, RS, Wellington for generation advancement.

Along with the station trial, 10 local materials from Jharkhand and west Bengal were collected and evaluated. The crosses were also made between some good performing lines during 2020-21 & 2021-22. The crosses (F1) made during 2020-21 had been raised during 2021-22 and the F2 seeds have been harvested and half seeds have been sent to IARI, RS, Wellington for generation advancement.

(Santosh Kumar, Preeti Singh)

Evaluation of Pigeonpea lines under rainfed conditions in acidic soil of upland

Pigeonpea is cultivated in Jharkhand and surrounding states having considerable area under acidic soils. In these states, pigeonpea cultivation has been increasing in recent years. Jharkhand has predominant feature of rainfed agriculture along with acidic soil conditions. Therefore, it is imperative to have suitable varieties for acidic soils and rainfed conditions of these areas. Little work on screening for tolerance to soil acidity in pigeonpea has been reported. Breeding of crops for acid tolerance requires a rapid and effective technique to discriminate between tolerant and sensitive genotypes. Taking this into consideration segregating MAGIC population derived from eight founder parents received from IARI, New Delhi were evaluated at IARI Jharkhand farm under specified soil acidity (pH <5.5, EC-0.12 ds/m and soil organic carbon 0.38%). The surface soil properties of experimental area have been 110 kg ha^{-1} available N, 4.69 kg ha^{-1} available phosphorus, 151 kg ha^{-1} available potassium, soil texture sandy clay loam and bulk density 1.64 g cm^{-3}. Total 77 lines were characterized under rainfed conditions in acidic soil of IARI Jharkhand. Recorded data on various yield determining traits revealed 13 lines with >300 pods per plant, 28 lines with 5 seeds per pod, 20 lines with 7-centimeter pod length, 15 lines with ≥25 nos. of primary branch, 12 lines with ≥100 nos. of secondary branch, 13 lines with ≥220-centimeter plant height and 11 lines with ≥11 pod cluster per plant. This study will be useful in identifying lines suitable under Jharkhand conditions and will be further utilized in breeding programme.

Pigeonpea lines evaluated in acidic soil of IARI Jharkhand farm under rainfed conditions

(Monu Kumar, Kumar Durgesh, Anima Mahato, Santosh Kumar, Preeti Singh and Dipak Kumar Gupta)

Optimization of number of rice seedlings per hill for higher seed productivity

Experimental trial for the optimization of number of rice seedlings per hill with the objective of getting higher seed productivity was conducted during *Kharif* 2020 at ICAR-IARI, Jharkhand. The eleven rice varieties recommended for Jharkhand state was used for the study. 21 days old seedlings were transplanted in four treatments (one seedling/hill; two seedlings/hill; three seedlings/hill and four seedlings/hill) of each varieties in three replications. The result revealed that the seed productivity was highest for two seedlings per hill.

(Priyaranjan Kumar, Santosh Kumar, Monu Kumar, Preeti Singh)

Productivity of rice-wheat system under biochar amended soil

An experiment was conducted during 2020-21 to evaluate the impact of rice straw derived biochar on productivity of rice-wheat system in acidic soil. In both the crops (rice and wheat) highest grain yield was obtained under biochar amended soil followed by recommended and farmers practices of fertilizer application. The obtained highest wheat yield was about 3390±165 kg/ha under treatment with biochar@10 t/ha + recommended dose of NPK while under recommended practices without biochar, the yield was 1850±390 kg/ha. Similarly, rice yield was found slightly higher (5750±250 kg/ha) under biochar amended soil as compared to recommended practices (5700±310 kg/ha), however difference was insignificant.

(Dipak Kumar Gupta and Arti Bhatia)

Biochar kiln for conversion of rice straw to biochar

A biochar kiln was developed to prepare biochar from rice straw. The obtained maximum loading capacity of chopped rice straw in the biochar kiln was 20 kg. The biochar yield was 65% of feedstock and biochar conversion rate was 2.1 kg biochar/hours.

Biochar Kiln: a) external view, b) internal view, c) Produced biochar

(Dipak Kumar Gupta and Arti Bhatia)

Evaluation of advanced breeding lines of tomato for yield and disease resistance

Eighteen advanced breeding lines including released varieties (Pusa Sheetal, Pusa Ruby, Pusa Gaurav, Pusa Uphar, Pusa Rohini and Pusa 120) were evaluated for yield and disease resistance (ToLCV and Bacterial Wilt resistance) under natural epiphytotic conditions (September transplanting) of Eastern

Plateau region of India. Results indicated susceptibility to moderately resistant (Disease index 0.2 to 0.61) phenotypic appearance for the diseases. Genotypes GKT-14 and GKT-12 were found better in terms of yield, quality and disease incidence. Sensory evaluation of tomato genotypes was also performed using nine points hedonic scale for 13 characters among 10 individuals, out of which juiciness and seediness characteristics were preferred and acid taste were most disliked.

Tomato genotypes (GKT-14 and GKT-12) showing tolerance to bacterial wilt and ToLCV

(Krishna Prakash and Vishal Nath)

A report on Fall Army Worm infestation in mungbean at ICAR-IARI Jharkhand Farm

Mungbean is the third important pulse crop of India after chickpea and pigeon pea. It is known for its high nutritive values, good quality protein and other valuable nutritional components. Other attractive features of this crop are short duration, low input requirement and suitability as a rotation crop in cereal-based cropping system. Mungbean can be grown thrice in a year, during *kharif*, *spring* and *summer*. The yield potential of mungbean is ~ 2.5-3.0 t/ha but, the average productivity is staggering low at 0.5 t/ha in different parts. This low productivity may be attributed to different biotic and abiotic constraints. Mungbean has been reported to be attacked by different species of insect pests i.e., whitefly, jassids, thrips and army worm that not only reduce vigor of the plant by sucking the sap but also transmit diseases.

Fall Armyworm (FAW), *Spodoptera frugiperda*, is a lepidopteran insect native to tropical and subtropical regions of the Americas and was reported as an invasive pest on maize in parts of Karnataka, Andhra Pradesh, Telangana in 2018. It is gradually spreading to many other states where extensive cultivation of maize is practiced. The invasion of FAW predominantly occurs in the warmer region with its presence regulated by climate, temperature, and precipitation. Mungbean, being a warm season crop, has shown high susceptibility to fall army worm.

Fall army worm has been reported to cause severe damage to both vegetative and reproductive parts. FAW infection began when the crop was in vegetative growth stage 35 – 40 days after sowing. The caterpillars superficially feed on the underside of leaves, producing semi-transparent patches or windows on the leaves. Young larvae feeds on the epidermal leaf tissues and make holes in leaves, the peculiar damage symptoms of FAW. The larvae also feed on the flower whorl causing a yield loss of ~25 percent. High palatability of mungbean has made it suitable for use as intercrop with maize for controlling FAW infestation and it has been reported that intercropping of maize with mungbean (1:1) may reduce FAW infestation in maize by ~25 %. This indicates high susceptibility of mungbean to FAW. It has emerged as a major concern to mungbean grower and further studies are needed to estimate the extent of damage caused by FAW in mungbean and the control measures to prevent its widespread damage across the country.

FAW infestation in moongbean

(Anima Mahato, Monu Kumar, Santosh Kumar, Preeti Singh and Ashok Kumar)

Genetic improvement of papaya for yield and quality enhancement

Diverse gene pool of papaya has been collected from hot spots of Jharkhand and their evaluation have been made during 2021 for yield performance as well as various other parameters. Studies were also made for sex reversal, sex confirmation, inter and intra plant hybridization during the period. Three plant types have been identified for higher yield and other horticulture traits. The entry JHP-4 yielded 40.59 kg fruit (First crop of 8 months duration) followed by JHP-5 (32.76) and JHP-6 (19.38). JHP-4 recorded an average fruit weight of 2.26 kg with saffron color pulp and 16.0^0 Brix TSS. The acceptability score of this line was 7.95 as per hedonic scale and was liked by consumers and households. The JHP-4 had hermaphrodite flowers (Gynodioecious type) which is considered desirable for papaya production. Single fruit progeny of this line has been raised for further detailed study as segregating population in next generation.

(Vishal Nath, Santosh Kumar, Krishna Prakash, Monu Kumar)

Planting material production of dragon fruit for their performance evaluation under the Eastern Plateau region of India

Planting material of three genotype of dragon fruit, received from Meghalaya and Pune were raised at the institute for their performance evaluation under the Eastern Plateau region. One of the Meghalaya genotype were able to produce fruit within one year of planting in field condition. The fruit of genotype was red coloured skin with red flesh type having a TSS of 15^0 Brix. The average fruit weight obtained was 270 gm and size

13.0 x 8.0 cm. The planting material of the genotype have been produced on mass scale for planting in the field and also distribution to innovative farmers visiting the institute.

Dragon fruit flowering and fruiting at IARI Jharkhand

(Krishna Prakash, PK Sinha and Vishal Nath)

Identification and evaluation of fruit crops

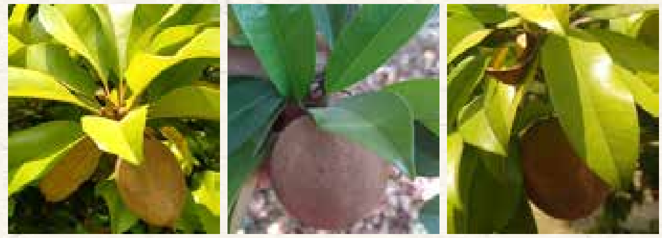
The orchard present at the Seed and Farm Unit, Gauria Karma (BAU Ranchi) having a large collection of released varieties of fruit crops like Mango, Litchi, Guava, Aonla, Chiku, Bael and Lemon. During the fruiting and harvesting time of some of the fruits (Mango, Litchi, Bael and Chiku), the varietal identification and fruit evaluation work has been carried out. The identified trees of different varieties will be useful in various activities in the future for obtaining planting materials and student research trials.

(Vishal Nath, Krishna Prakash and Pankaj Kumar Sinha)

Varietal identification and fruit evaluation of mango

Fruit maturity studies in Sapota

The climatic condition of Jharkhand is highly suitable for the commercial plantation of various fruit crops. A well-organised plantation of improved varieties of various fruit crops was established at the Horticulture Farm of 'Seed and Farm Unit' of Birsa Agriculture University at Gauria Karma, Hazaribagh. A study was conducted at the Birsa Horticultural Farm with three varieties of sapota/chiku namely, Kallipati, PKM-1 and PKM-2 for evaluation to their maturity ripening and keeping qualities. Non-synchronised maturity is present in sapota and therefore, 4-5 picking is required for harvesting according to their stage of maturity. Vegetative parameters as per their age were recorded and fruit yield per tree was estimated. Fruit size, shape, pulp recovery, TSS and other fruit and plant leaf parameters were also recorded for three trees in each variety. The harvested fruits were evaluated for organoleptic preferences on nine-point basis hedonic scale for their taste, aroma, pulpiness, etc. Based on observations among the three varieties, PKM-2 was ranked first.



Images showing three varities PKM-2, Kallipati, and PKM-1

(Asha Kumari, Vishal Nath, Krishna Prakash)

Plant based edible coating of guava

Consumers always demand fruits without artificial and chemical coating that may result many health issues and safety issues. During processing of fresh guava fruit which involve washing. sorting, grading and packaging effect the integrity of the fruits. Edible film or edible coating gives sparkly appearance and enhance the shelf life to the fruits. Natural edible gums, gum arabic (GA), gum ghatti (GG), and herbal based, aloe vera gel (AVG) have been identified for plant based edible coating material for guava. Gum arabic and gum ghatti tears were primary processed and macerated initially. Afterwards, the macerated gum ghatti solutions were filtered and stored in deep freezer at -20 °C for different combination of coating according to the selected parameters. Similarly, aleo vera gel were primary processed and stored at -20 °C for the coating application. Proportion of coating were developed as GA-100%, GG-100%, AVG-100%, GA+GG-50%+50%, GA+AVG- 50%+50%, GG+AVG- 50%+50%, GA+GG+AVG- 35%+35%+30%.

Aleo vera plant and

Aleo vera gel

Gum ghatti tears and

Purified gum ghatti solution

Processing and extraction of edible coating material for guava coating

(Ranjit Singh, Krishna Prakash)

Education

Achievement during Academic Session 2020-21 and 2021-22

ICAR-IARI Jharkhand is running its academic programme as PG outreach institute under Post Graduate School, IARI New Delhi. During the academic sessions 2020-21 and 2021-22, 32 and 29 students were admitted to M.Sc./M.Tech. courses in 12 different disciplines, respectively. The admissions to the M.Sc./M.Tech. programme were based on an AIEEA (PG) and AICE-JRF conducted by the NTA/ICAR. Earlier, 23 M.Sc./M.Tech. students had passed out from ICAR-IARI Jharkhand and subsequently awarded degree by Post Graduate School, IARI, New Delhi.

The institute is providing good facility to students *viz.*, smart and virtual classroom for attending online classes, library, study room with computer facility, laboratories, FOSU unit, Agricultural and Horticultural farm area, guest house, outdoor sports facility etc. The institute is developing facilities for accommodating undergraduate and postgraduate students in boys (with 174 rooms capacity) and girls (with 150 rooms capacity) hostels.

Monthly Seminar series by Scientists

- The monthly talk of June deliverd by Dr. Vishal Nath on 26th June 2021 on topic"*Plant canopy architecture and management in fruit trees*".
- The monthly talk of July 2021 delivered by Dr. Shilpi Karketta on 31st July, 2021 on topic " *Biostimulation: Innovative technique to improve reproductive efficiency in farm animals* ".
- The monthly talk of August 2021 delivered by Dr. Preeti Singh on 28th August, 2021 on topic " *The IPCC climate change report: Why it matters to everyone on the planet* ".
- The monthly talk of September 2021 on 25th September, 2021 by Dr Santosh Kumar on topic " *Biofortification: Sustainable way to alleviate malnutrition*".
- The monthly talk of November 2021 on 27th November, 2021 by Dr Sougata Bhattacharjee on topic "*Biotechnology: modern tool for crop improvement*".

Library and learning resources

The Indian Agricultural Research Institute-Jharkhand started its services for library users on 26th September 2021 with an initial collection of 63 text books. A total of 60 publications were added comprising 34 text books and 14 annual reports, 5 Newsletters and 7 institutional publications of different ICAR institutes in the library during the period. Currently, the institute library is equipped with a separate student reading room facility, Wi-Fi internet connectivity, xerox cum printing and newspaper facility for the convenience of the users. Process of purchasing/acquiring various publications, subscribing to journals and access to online learning resources like CeRA *etc* have been initiated.

A view of library and student reading room

WORLD SOIL DAY 2021

The ICAR- Indian Agricultural Research Institute, Gauria Karma, Jharkhand celebrated the *World Soil Day - 2021* on the Theme - "*Halt Soil Salinization: Boost Soil Productivity*". Delivering the welcome address, Dr. Manoj Chaudhary, Scientist (Soil Science) stressed on the inclusive development of soil. He also accentuated on the importance of Soil Salinization and Soil Acidity on crop productivity and their management with the application of proper quantity of gypsum and lime in salt-affected and acid soils, respectively. The Soil Scientist, Dr. Preeti Singh, highlighted the ways in which every person at individual level has to act to protect and make the soil healthy. She also emphasized on the importance of Soil Health Cards for maintaining healthy soil for the benefits of the future generations. She also apprised the farmers about the Crop Residue Management and Rain Water Harvesting. The organizer, Dr. Santosh Kumar, Scientist, ICAR-IARI, Jharkhand urged the use of balanced fertilizers and insecticides in soil for crop production. The event registered participation of 150 farmers, 12 M.Sc. (Agriculture) Students; 15 scientists and several staff Members of ICAR-IARI, Jharkhand.

Celebrating World Soil Day, 2021

Inauguration of Institute Guest house and Naming of New `Administrative and Academic Building after Late Dr. Shyama Prasad Mukherjee on his Birth Anniversary

On July 6, 2020, Hon'ble Union Minister of Agriculture & Farmers Welfare, Rural Development and Panchayati Raj, Shri Narendra Singh Tomar inaugurated the newly constructed guest house of the IARI-Jharkhand and named the new Administrative and Academic building after Late Dr. Shyama Prasad Mukherjee on his birth anniversary through video conference in the gracious presence of Shri Parshottam Rupala, Hon'ble Minister of State for Agriculture and Farmers Welfare, Dr. Trilochan Mohapatra, Secretary, DARE & DG, ICAR, New Delhi and Dr. Ashok Kumar Singh, Director, IARI, Jharkhand.

Hindi Diwas Celebration

Hindi diwas was celebrated on 14 september, 2021 among the scientific staff and students of ICAR-IARI, Jharkhand under the chairmanship of Dr. Vishal Nath, OSD, ICAR-IARI, Jharkhand to highlight the importance of our national language Hindi in agriculture science.The programme was led by Dr. Manoj Chaudhary, Chairman, Rajbhasha and coordinated by Dr. Shilpi Kerketta and other member of Rajbhasha committee. A hindi quiz and hindi slogan writing competition was organised, which was actively participated by all the IARI staff and students.

Hindi Diwas Celebration at institute

EXTENSION

Baseline survey in Hazaribagh to identify and prioritize researchable issues

Primary and Secondary data has been collected from 800 farmers (25 farmers from each village of 4 different *Panchayat* of each selected block) of different socio-economic strata covering 8 Blocks of Hazaribagh district i.e. Chouparan (Murtiya, Daihar, Jhapa and Vrindavan), Barhi (Buridih, Padrima, Bahrabad and Bijaiya), Churchu (Ango, Nagri, Sarwaha and Daso Khap), Bishnugarh (Kharki, Galhowar, Uncha Ghana and Chano), Katkamsandi (Kanchanpur, Asdhir Shahpur and Guri), Karedri (Lochar, Garri kala, Kuthan and Ghutu), Barkagaon (Chandpur Baliya, Harli, Chandaul and Barkagaon Paschim) and Hazaribagh (Sindur, Jagdishpur, Amnari and Sarauni Kala). A total of 32 randomly selected villages have been surveyed during data collection using semi-structured interview schedule and Focussed group discussion which constituted the total sample size of 800.

The collected data revealed that Rice is the major crop during kharif season occupying more than 70% of available land followed by maize, peagon pea, black gram, sesamum, and vegetables. During rabi season more than 80% cultivated area remain fallow due to unavailability of assured irrigation and proper fencing. The major crop during rabi include wheat (30%), potato (40%), and vegetables (30%) which constitute nearly 20% of total cropped area. The main sources of seeds either cereals or vegetables are private shops. Majority of farmers (>90% respondent) use hybrid rice varieties while traditional varieties of wheat and pulses are used by farmers. The mechanization was found poor due to small land holding and poor availability of money for rent. Still >60% area is ploughed by bullock. Thresher was found common instrument being used by most of the farmers.

Tribal Sub Plan

The **Tribal Sub-Plan** (TSP) is a planning concept to channelize the flow of benefits from the central government for the development of tribal populations. As part of TSP, the ICAR-IARI, Jharkhand is actively engaged in enhancing the standard of living of tribal farmers by increasing their income through increased agricultural productivity. Under TSP, ICAR-IARI, Jharkhand conducted two training programs on the topic "उच्च उत्पादकता हेतु वैज्ञानिक पद्धतियों द्वारा गेहूं, चना एवं शीत ऋतू की सब्जियों की खेती" for tribal farmers of village Daudwa on 08.12.2021 and village Kundwa on 18.12.2021 in Khonra Ahar panchayat of Barhi block in Hazaribagh district. The objective of the training program was to provide insights into the scientific package of practices of different crops for getting higher productivity and consequently higher income. All the scientists of the institute attended the training program and shared their knowledge to farmers in order to improve the earnings from farming. Tribal farmers were also motivated for farming of maize, speciality corn, vegetables, wheat, chickpea and other crops of their region by adopting the improved practices. A total of 262 tribal farmers got benefitted from this training program. Seeds of improved varieties of vegetables, wheat, and chickpea were also provided to the participants after the training programme. During 2021, 262 tribal farmers received 475 vegetable seed kits; 100 farmers received wheat seed @ 5 Kg/farmer; 40 farmers received chickpea seeds @ 2 kg/ farmer.

Distribution of seed inputs to the tribal farmers after training program under TSP

Distribution of seed inputs to the tribal women farmers under TSP

Scheduled Castes Sub Plan (SCSP)

The project has been developed for the effective implementation of the Scheduled Castes Sub Plan (SCSP) with various components of infrastructure development, facilities creation, training programmes and farm input supply for the benefit of scheduled caste farmers/communities of Jharkhand. Facilities to be created for the benefit of the farmers, youth, entrepreneurs and students of the community include the creation of an Integrated Farming System (IFS) model, On-farm skill centre, custom hiring centre, laboratory facilities, hostels and accommodation facilities, training centre and other need-based set-ups in consultation with competent authority's time to time. To start the project, benchmark data and soil samples have been collected and analysed. Under the farm-input supply component, fertilizers, seeds and planting materials of various agricultural and horticultural crops will be procured from authorized centres and will be distributed among the farmers in a phased manner as per the availability and seasonal requirements. The kitchen garden module will be developed and implemented at the household level. Animals (Goats, piglets, chicks and fingerlings) component will also be procured and distributed among the needy farmers. Small farm-implements kits useful for marginal farmers have been planned to be procured and distributed among the group of farmers. Need-based training programmes, scientist-farmers interface programmes, farmers' field visits, demonstrations of successful technologies have been a regular phenomenon under the project and will continue. During 2020-21, 400 kg of wheat seeds and 25 kg of chickpea seeds have been distributed among 200 farmers of Nischitpur and Kajra village of Hazaribagh district. Three scientist-farmers interface programmes were also organised for the dissemination of improved cultivation practices of agri-horti crops.

Organization of Kishan Goshthi

Participants of Kishan Gosthi held on 26th Sept. 2020

'Kishan Gosthi' was organised to make aware the farmers about the improved agricultural technologies needs to be adopted for improved livelihood and income secutity of the farmers of Jharkhand on **28th August, 2020** at IARI-J, Gauria Karma, Hazaribagh, Jharkhand.

'Kishan Gosthi' was organised to make aware the farmers about the improved agricultural technologies needs to be adopted for improved livelihood and income secutity of the farmers of Jharkhand on **26th Sept., 2020** at IARI-J, Gauria Karma, Hazaribagh, Jharkhand.

'*Kharif* Krishak Prakshetra Pathsala' was organized on 14th August, 2021 in collaboration with ATMA, Hazaribagh to disseminate and diffuse improved scientific technologies of *Kharif* crops for higher productivity and profitability to nearly 30 nos. of farmers.

'Kishan Gosthi' was organized on 25th October, 2021 in collaboration with ATMA, Hazaribagh in Barhi Block to disseminate the improved scientific technologies of Agriculture and allied sectors for improving their livelihood, nutritional and income security for nearly 50 nos. of farmers.

'*Rabi* Krishak Prakshetra Pathsala' was organized on 26-27th October, 2021 in collaboration with ATMA, Hazaribagh in Padma Block to disseminate and diffuse improved scientific technologies of *Rabi* crops for higher productivity and profitability to nearly 100 nos. of farmers.

Participation in Doordarshan Hello Kisan programme on DD Kisan Channel:

Dr. Krishna Prakash, scientist, Horticulture participated in "Hello Kisan" programme on the topic "Coconut and Arecanut Farming" organized by DD Kisan Channel on 21/07/2021 and 22/10/2021 as Expert member and also to answer the queries of the farmers on the related topic.

Dr. Pankaj Kumar Sinha participated in "Hello Kisan" programme on the topic "Natural Farming" organized DD Kisan Channel on 26th January, 2022 as Expert member to answer the query of the farmers related to Natural Farming in India.

Capacity Building

Mushroom cultivation and Production Training

One day training on "Mushroom cultivation and production" on 13th October 2020 for 25 selected farmers of Gauria Karma and Kedarut panchayat at ICAR-IARI, Jharkhand.

One Day training Programme on "Oyster Mushroom Cultivation for Livelihood Improvement" to farmers of Gauria Karma and Kedarut Panchayats on 06th Nov. 2020 at ICAR-IARI-J, Gauria Karma, Hazaribagh.

Demonstration cum two days' workshop on Mushroom Cultivation was organized at JAPTC Padma, Hazaribagh to create awareness about mushroom production, marketing and its nutritive value among the trainees. In this workshop a resource persons Mrs. Amrita Mahto, progressive farmer and entrepreneur, interacted with more than 100 number of participants. Shri Kishore Kaushal (SP), JAPTC, Padma also interacted with the scientists of IARI, Jharkhand and resource person during this workshop.

Institute Building Activities

Presentation of research project proposals

The presentation of Draft RPP-1 by the scientists of IARI-Jharkhand were held at the Smart Lecture Hall of the Institute on 7th, 8th and 10th June 2021, and 17th July,2021. The following scientists were presented, participated and discussed during the different presentations- Vishal Nath, Priya Ranjan Kumar, S.K Mahanta, Manoj Chaudhary, Dipak Kumar Gupta, Pankaj Kumar Sinha, Krishna Prakash, Monu Kumar, Santosh Kumar, Preeti Singh, Anima Mahato, Shilpi Karketta, Ranjit Singh and Himani Priya.

Exploration and germplasm collection

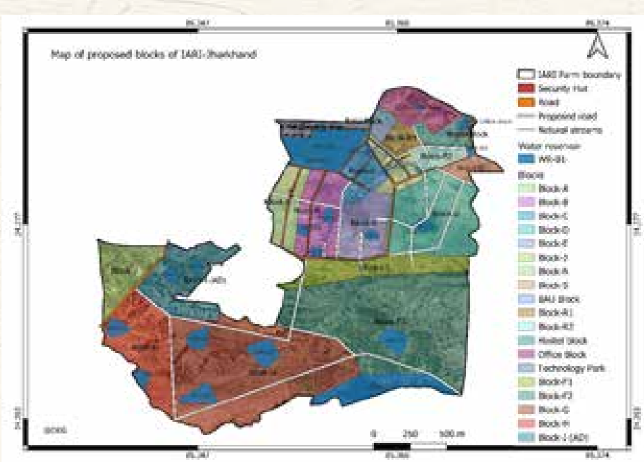
An exploration and germplasm collection program on millets, mungbean, maize, brassica, papaya, cucurbits, ornamentals and Crop Wild Relatives was undertaken by Dr. Santosh Kumar and Dr. Anima Mahato in collaboration with NBPGR, Regional Station, Ranchi in Purulia district (Kalyan Vivekanandpur, Gurguria, Raghunathpur, Garpanchkot, Netura, Saltore, Para, Kashipur, Merigipahara, Chakadih, Burkura, Painja, Hura, Puncha, Adra, Balrampur, Ajodhya Hill, Majidih, Barabazar, Manbazar) of West Bengal, Saraikela Kharsawan district (Dalma wild life sanctuary, Makulakocha, Chakulia, Pindaribera, Kandra, Kharsawan, Dalbhanga, Siadih, Rugudih, Gomiadih, Kuchai, Cherubera) and adjoining parts of Ranchi district (Tamar) of Jharkhand. A total of 125 accessions belonging to 25 species and 10 crop wild relatives were collected. Seed samples (Total 70) of different crops, maize (7), cucurbits (21), *Vigna* sp. (22), fababean (1), winged bean (1), kulthi (8), forage legume (1), niger (1), chilli (2), *Solanum incanum* (1), *Solanum violeceum* (1), sesamum (2), wild okra (1) for characterization and multiplication. The seeds after multiplication and characterization data will be submitted to NBPGR for obtaining IC No. and conservation in genebank. The collected material will be utilized in breeding program.

Illustrations of germplasm collected, (a) Lotni sarso, (b) *Cleistanthus* sp. (Garari), (c) *Asparagus* sp., (d) *Crotolaria sagittalis*, (e) *Cucumis sativus* var. *sativus*, (f) Farmer holding white maize landrace

Exploration and germplasm collection was conducted by a team of three scientists, Dr. Krishna Prakash and Mr. Monu Kumar from IARI Jharkhand and Dr. S.B. Choudhary, Station In-charge, NBPGR RS Ranchi in three districts, Gumla, Latehar and Palamu, Jharkhand from 30th November to 11th December 2021. Multi-crop germplasm collection were carried out for various agri-horticulture crops from both the cultivated fields and uncultivated/forest lands/river beds/ roadsides. Total 47 germplasm including landraces and crop wild relatives of cereals (Rice, Maize), pulses (Pigeonpea, Horse gram, Vigna), millets (Finger millet), oilseeds (Niger, Lotni Sarso), fibre crops (Jute, Sunhemp), fruits (Papaya, Lemon), vegetables (Chilli, Brinjal, Cucumber, Mucuna, Okra and Gourds) and several medicinal plants were collected. During this trip, important information was also gathered with custodian farmers and local people of the area and collected useful information about crops, landraces, crop wild relatives, underutilized crops and associated ITKs. The exploration team visited one 'Traditional Seed Bank' in Palakot Block of Gumla district which was fully managed at the community level. At this centre, the seeds of various agri-horti crops were being stored using earthen pots with proper care and a replacement system is being followed every year to maintain quality seeds. Success stories of custodian farmers growing some unique landraces of rice in Gumla district were also recorded. The team observed potentiality of tradiotional rice growing areas in Gumla district towards the large scale seed production of rice landraces through creation of various clusters and government support. The team also visited KVK Gumla and collected information about the status of forest-origin medicinal plant products. In Palamu district, the team visited surrounding and inside the forest areas of Betla National Park along with forest guards and collected potential germplasm of some horticultural crops and forest plant species. This was one of the first of its kind visiting inside the core zone of Betla National Park for plant germplasm exploration work.

Traditional seed bank at Palakot, Gumla

Farm map Developed



Map of proposed farm blocks of IARI-Jharkhand developed using QGIS, Google satellite map and field survey. A digital map of various proposed Farm Blocks of IARI Jharkhand was developed in consultation with OSD, IARI-Jharkhand.

Horticulture nursery cum mother block developed

An area comprising eight hectares of land has been identified for horticulture crop nursery, mother plant block and medicinal and aromatic plant garden. The demarcated area was initially fully undulated and barren/non-arable land which is being developed with proper layout planning for suitable use. The nursery area is meant for raising plantlets of various horticultural crops in different seasons, storing FYM and making polyhouses/shade nets. The area under Mother Plant Block cum Instructional Farm of horticultural crops is being used for raising improved varieties of subtropical fruit crops like mango, litchi, bael, guava, jackfruit, jamun, sapota, pomegranate, aonla, custard apple, palms, lime and lemons, and other major-minor fruit crops. The work has also been initiated for the collection and planting of some major and common medicinal-aromatic plants in the designated medicinal garden which will be very useful for students, researchers and other stakeholders.

Layout of horticulture nursery area and mother plant block

Farm infrastructure development activities

- ✓ The construction of Farm Building by CPWD has been completed.
- ✓ Bush cleaning has been done in about 20 hectares of land .
- ✓ About 12 hectares of new experimental plots has been developed.
- ✓ New kacha roads of about 2500 m length and 8 m width has been demarcated and developed.
- ✓ The dimension of one pond has been increased by about 2000 m^3 by widening and deepening.
- ✓ The outline for laying down irrigation pipe line (HDPE) in the proposed technology park (4 ha) has been developed.
- ✓ Horticultural nursery block of about of 8 ha area has been developed.
- ✓ About 4 ha land under proposed technologies park has been developed.

Republic Day and Independence Day Celebration at ICAR-IARI Jharkhand

72th Republic Day and 74th Independence day was celebrated at ICAR-IARI campus with great enthusiasm among scientific, non-scientific staff and children from local area. After flag hoisting, a small cultural event and sports activity were organised on this occasion, which was actively participated by both staff members and local children. For encouragement among children, a memento was distributed as a token of love and appreciation by respected OSD, ICAR-IARI Jharkhand.

Address of OSD to children on the occasion of Independence Day

Gathering of scientific and other staff for Independence Day celebration

Swachhata Week

Swachhta week was observed as a part of Swachh Bharat Abhiyan from 22.10.2021 to 29.10.2021 at IARI, Gauria Karma, Jharkhand with an objective to bring intense focus on the issues and activities related to Swachhta. This Swachhta week was categorised into different activities of cleaning the office premises, residential area, farm building area etc. to conduct the programme at the institute successfully. On the first day, all the scientists and staff of the institute took the "Swacchta week" pledge led by Dr. Vishal Nath, OSD, ICAR-IARI, Gauria Karma, Jharkhand regarding the cleanliness of the institute farm and campus. He also briefed the activities to be organized during the week.

Eradication of Parthenium and cleaning of administrative premises

Celebrations of institute Foundation Day (Virtual)

On 28th June, 2021, the foundation day programme of ICAR-Indian Agricultural Research Institute Jharkhand, Gauria Karma, Barhi, Hazaribagh, Jharkhand was celebrated in virtual mode. Sh Jayant Sinha Ji, Member of Parliament (Lok Sabha), Hazaribagh and Chairperson of Parliamentary Standing Committee on Finance was the Chief Guest and Speaker. The programme was chaired by Dr Trilochan Mohapatra, Director General, ICAR & Secretary DARE. Dr A K Singh, Director, ICAR-IARI, New Delhi, Dr T R Sharma, DDG (Crop Science), Dr Rashmi Aggarwal, Dean & Joint Director (Education), IARI, New Delhi and DDGs, ADGs, Director(s)of sister institutes, Heads of the divisions, Professors, Scientists, students and farmers of Jharkhand were present during the programme. Dr A K Singh, Director, ICAR-IARI, New Delhi welcomed the chief guest, and all the dignitaries and presented the brief report about the institute and progress of work. Rupees 137 crore have been allotted to ICAR-IARI, Jharkhand under next 5 years plan for the developmental activities. The institutes have awarded post graduate degree to 44 students in 12 disciplines. Dr Trilochan Mohpatra, Director General, ICAR & Secretary DARE extended hearty welcome to all and congratulated IARI Jharkhand as well as IARI Delhi on this foundation day. He introduced the Chief guest of the function, Sh Jayant Sinha Ji, Member of Parliament (Lok Sabha) who is associated with ICAR-IARI, Jharkhand since its inception. He highlighted the mandate of IARI Jharkhand for bringing the benefits of improved agricultural research, education and extension to the region. Sh Jayant Sinha Ji delivered the foundation day lecture and stressed upon the role of green revolution and white revolution in food and nutritional security of the country. He emphasized more research activities on fisheries and horticultural crops in the future in North Easter Region for enhancing the income and livelihood security of the small and marginal farmers of the region. He also appreciated the work of ICAR for food and nutritional security of the country through the green revolution for making India self-reliant in food production. He also encouraged the scientists of IARI, Pusa New Delhi for developing several high-yielding varieties and technologies. He emphasized the research priorities on climate-smart technologies and urged for development of world-class research facilities at IARI Jharkhand as well as to develop the food processing technologies which is the need of an hour. Dr Rashmi Aggarwal, Dean & Joint Director (Education), IARI, New Delhi presented the vote of thanks.

Celebrations of ICAR- IARI Jharkhand Foundation Day

Distinguished Visitors

1. Dr. D.K. Yadava, ADG Seed, ICAR, New Delhi on 20.12.2021
2. Dr. Sanjay Kumar, Director, ICAR, Indian Institute of Seed Research, Mau on 20.11.2021
3. Dr. A. K. Singh, Director IARI-Jharkhand on 20.11.2021
4. Joint Director (Research) IARI, New Delhi on 27.09.2021

Chairman, Works committee IARI-New Delhi holding a meeting

Dr A.K. Singh, Director along with ADG Seeds interacting with student of IARI Jharkhand

Visit of Hon'ble Director, ICAR IARI Jharkhand

Awards and Honours

- Dr Dipak Kumar Gupta, Scientist (SS) received Rajbhasha Gaurav Award (third) 2019-20 for co-authoring a hindi book "फल विज्ञान और प्रबंधन" by Department of official language, ministry of home affairs, government of India on 14th September, 2021 in presence of Honourable Union Home Minister, Shri Amit shah.

- Dr. Santosh Kumar received best oral presentation award in International conference on Food, Agriculture and Innovations (3rd ICFAI) (online) during December 24-26, 2021.

Externally Funded Project

- **Popularization of bio fortified maize hybrids (QPM+ProVit.A enriched) for sustainable nutritional security and upscaling entrepreneurship to boost up farmers' income in Jharkhand.**

- Budget detail: 16.80 lakhs
  Date of sanction of project: 23.12.2021

Objectives of the project

1. Popularization of bio-fortified maize hybrids (QPM+ProVit.A enriched) in Jharkhand with special emphasis in tribal maize eating areas of Jharkhand to ensure nutritional security.
2. Promotion of quality seed production and timely availability of breeder, foundation and certified seeds of bio-fortified maize hybrids to the farmers.
3. Upscaling the Entrepreneurship Skill of farmers for producing the hybrid seeds of these biofortified maize hybrids at the local level in Jharkhand.

Team of the project

ICAR-Indian Agricultural Research Institute, Gauria Karma, Hazaribagh, Jharkhand	
PI	Santosh Kumar, Scientist, ICAR-IARI, Jharkhand
Co- PI Monu Kumar, Scientist, ICAR-IARI, Jharkhand Dr. Anima Mahato, Scientist, ICAR-IARI, Jharkhand Preeti Singh, Scientist, ICAR-IARI, Jharkhand Dr. Dipak Kumar Gupta, Scientist, ICAR-IARI, Jharkhand Dr. Pankaj Kumar Sinha, Scientist, ICAR-IARI, Jharkhand Dr. Krishna Prakash, Scientist, ICAR-IARI, Jharkhand Dr. Shilpi Kerketta, Scientist, ICAR-IARI, Jharkhand Dr. Ashok Kumar, Scientist, ICAR-IARI, Jharkhand	
ICAR- Indian Agricultural Research Institute, New Delhi	
CC PI	Dr. Firoz Hussain, Principal Scientist, ICAR-IARI, New Delhi
CCCo-PI	Dr. Vignesh muthusamy, Scientist, ICAR-IARI, New Delhi Dr. Raj Kumar U. Zunjare, Scientist, ICAR-IARI, New Delhi

- **Sustainable Intensification of Pulses in Rice Fallow Ecosystem for Nutritional and Livelihood Security in Jharkhand**

  Budget detail: 13.38 lakhs
  Date of sanction of project: 23.12.2021

Objectives of the project

1. Dissemination of pulse production technology to cultivate rice fallow in rabi and upland areas in kharif at farmers' field for improving nutritional and livelihood security.
2. Development of seed village for promotion of quality seed production and timely availability of quality seeds of selected and improved varieties of pulses.
3. Promoting startups and agri-preneurial skills among youths and farmers in producing quality seeds of improved varieties of different pulse crops in Jharkhand

Team of the project

ICAR-Indian Agricultural Research Institute, Gauria Karma, Hazaribagh, Jharkhand	
PI	Dr. Anima Mahato, Scientist, ICAR-IARI, Jharkhand
Co- PI	Mr. Monu Kumar, Scientist, ICAR-IARI, Jharkhand Mr. Santosh Kumar, Scientist, ICAR-IARI, Jharkhand Dr. Pankaj Kumar Sinha, Scientist, ICAR-IARI, Jharkhand Dr. Dipak Kumar Gupta, Scientist, ICAR-IARI, Jharkhand Dr. Krishna Prakash, Scientist, ICAR-IARI, Jharkhand Preeti Singh, Scientist, ICAR-IARI, Jharkhand Dr. Shilpi Kerketta, Scientist, ICAR-IARI, Jharkhand

Media coverage

कृषक प्रक्षेत्र पाठशाला का द्वितीय बैठक सम्पन्न, कृषि से संबंधित कई बिंदुओं पर हुई चर्चा

संध्या प्रहरी : बरही रितेश कुमार / अनुज यादव

आत्मा हजारीबाग के दिशा निर्देश पर बरही प्रखंड अंतर्गत करसो गांव में बुधवार को कृषक प्रक्षेत्र पाठशाला का दूसरी बैठक सम्पन्न हुई। जिसमें खरीफ मौसम में लगे धान की उन्नत तकनीकी से की गई खेती का भ्रमण किया गया। जिसमे करसो में खाता नंबर 3 प्लॉट नंबर 1277 पर पाठशाला का आयोजन हुआ। साथ ही फसल का निरीक्षण किया गया। जिसमें कीट बीमारियों से बचाव आई पीएम प्रयोग व लाभ फसल कटाई के समय ग्रीसिंग, भंडारण एवं रवि फसल की तैयारी, सूक्ष्म, सिंचाई प्रणाली के लाभ, जैविक खाद बनाने की विधि आदि विषय पर चर्चा हुआ।

मौके पर डॉ पंकज कुमार, डॉ शिल्पी केरकेटा, बरही प्रखंड तकनीकी प्रबंधक चिंताहरण पाठक, सहायक तकनीकी प्रबंधक उमेश राणा सहित कृषक मित्र उपस्थित रहे।

बरही में महिलाओं को दिया गया मशरूम की खेती का प्रशिक्षण

मशरूम उत्पादन कर कमाएं अधिक मुनाफा

भारतीय कृषि अनुसंधान संस्थान गौरियाकर्मा ने आयोजित की कृषक प्रशिक्षण सह बीज वितरण कार्यक्रम

160 किसानों ने लिया भाग, उत्तम एवं नवीनतम तकनीकी की दी गई जानकारी

Editors :

Preeti Singh, Ashok Kumar, Krishna Prakash, Manoj Chaudhary,
Ranjit Singh, Santosh Kumar, Shilpi Karketta, S.K Mahanta, Vishal Nath, Asha Kumari

ICAR-IARI-Jharkhand

Gauria Karma, Hazaribag-825405, Jharkhand