PULSES Newsletter

Indian Institute of Pulses Research, Kanpur

VOLUME 24, No. 2 APRIL - JUNE, 2013

CONTENTS

News 2
- Chairman, UP Seed Development Corporation Visited IIPR
- Institutional Biosafety Committee Meeting

Research Highlights 2-5
- Parasitization of *H. armigera* by Tachinid fly, *Carcelia illota*
- Cytological Investigations on Herbicide Treated Seedlings of Pigeonpea and Chickpea
- Variability for Agronomically Important Traits among Wild Accessions of *Cicer*
- New Variety Identified
- Western Hybridization for Detecting Expression of δ-Endotoxin in Transgenic Pulses
- Occurrence of Chickpea Rust in Late Planted Chickpea in North India
- Iron Chlorosis in Chickpea
- Evaluation of Acaricides for Management of Sterility Mosaic Disease in Pigeonpea
- Changing Scenario of Pod Sucking Bug Damage in Mungbean
- New Report on Occurrence of *Fusarium falsiforme* in Chickpea
- Development of Pre-Treatment-*cum*-Polisher Unit for IIPR Mini *Dal* Mill

प्रौद्योगिकी हस्तान्तरण 6-7
- कलेहपुर में मूँग दिवस का आयोजन
- सफलता की कहानी : आय में वृद्धि के लिए गेहूं के स्थान पर चना की खेती

Personnel 7

Director's Desk 8

Annual Group Meet on Pigeonpea, Mungbean and Urdbean

The Annual Group Meet on pigeonpea, mungbean and urdbean was held on May 13-15, 2013 at TNAU, Coimbatore. About 200 delegates from cooperating centres, SAUs and State Departments of Agriculture participated in the meet. The group meet was inaugurated by Dr. B.B. Singh, ADG (O&P), ICAR, New Delhi. Dr. K. Ramasamy, Hon'ble Vice Chancellor, TNAU presided over the inaugural function. Dr. B.B. Singh, in his inaugural address expressed happiness over the increasing production and productivity of pulses in the country and suggested for conduct of FLDs using CVRC released varieties with full recommended package of practices. He also emphasized on use of molecular breeding in *Vigna* and pigeonpea. In pigeonpea, he stressed upon the need of developing new sources of CMS for production of commercial hybrids. Dr. Ramasamy, in his presidential address explained the improving situation of pulses cultivation in Tamil Nadu. He exhorted the scientists to concentrate on basic research such as plant genetics, physiological processes, harvesting soil moisture, reducing plant area and differential extraction of resources.

Dr. N. Nadarajan, Director IIPR and Acting Project Coordinator (Pigeonpea) elaborated R&D activities in mungbean, urdbean and pigeonpea in the country and discussed about various constraints and researchable issues in these pulses. He stressed upon the need of increasing genetic variability through distant hybridization and pre-breeding in *Vigna* and pigeonpea and development of transgenics for pod borer resistance and drought tolerance in pigeonpea, tailoring suitable plant types for different seasons and systems, development of genomic tools, devising micro-irrigation systems, identification of suitable intercropping systems, effective location specific IPM modules and development of farm machineries for reducing drudgery and post-harvest losses. He also presented the Project Coordinator's report.

Dr. Sanjeev Gupta, PC, MULLaRP presented the Project Coordinator's

report. He applauded the increase in production of urdbean and pigeonpea despite delayed monsoon in some states like Rajasthan, Punjab, Maharashtra, western Uttar Pradesh and excessive terminal rains in Uttar Pradesh, M.P., Bihar and Chhattisgarh which affected the production of mungbean negatively. He informed the house that mungbean and urdbean are finding place in newer niches and this year two lakh ha additional area came under cultivation in these two crops. Dr. Gupta appraised the house that good material, especially resistant to the two species of yellow mosaic disease (MYMV, MYMIV) is available. Besides, work has been initiated on molecular breeding and markers have been identified which are linked to MYMIV. He also emphasized upon the need of identifying newer molecules for the control of weeds. After thorough discussion, the technical programmes for 2013-14 were finalized for each discipline.

Chairman, UP Seed Development Corporation Visited IIPR

Mr. Ujjawal Raman Singh, Chairman, Uttar Pradesh Seed Development Corporation visited IIPR along with Mr. Mukesh Gautam, Managing Director and other officials of the Corporation on April 11, 2013. The objective of this visit was to know about the latest technological advancements as well as newly developed varieties of pulse crops which could be beneficial for the state. The dignitaries had a long meeting with Dr. N. Nadarajan, Director, IIPR as well as Nodal Officer (Seeds) of the Institute and discussed about different pulse varieties developed by the Institute which specifically suit the agro-climatic conditions of Uttar Pradesh. Dr. Nadarajan appraised the visitors about the major research activities of the Institute such as genomics, transgenics, cropping systems research, *etc*. They also discussed about the package of practices of various pulses, plant protection measures, resource conservation technology and the areas where IIPR could be of help to the Seed Corporation as well as U.P. State. Mr. Singh expressed happiness over the research work carried out by the scientists and desired to have an active collaboration between the Corporation and IIPR.

Institutional Biosafety Committee Meeting

The 10th Institutional Biosafety Committee (IBSC) meeting was held on June 1, 2013 under the Chairmanship of Dr. N. Nadarajan, Director. The meeting was attended by Dr. Samir Sawant, NBRI (DBT Nominee), Dr. P.K. Singh, Govt. Medical College, Kannauj (Biosafety Officer) and other internal experts Drs. S.K. Chaturvedi, Subhojit Datta, P. Nandeesha, K.R. Soren and Alok Das (Member Secretary). The Committee reviewed the on-going research programmes of the Institute and visited the laboratories and green houses for monitoring of biosafety compliance. The Committee exhorted the need for reduced use of carcinogenic chemicals like Ethidium bromide, polyacrylamide gels with bio-safe alternatives. The Committee expressed satisfaction over the compliance of biosafety norms at the Institute.

Research Highlights

Parasitization of *H. armigera* by Tachinid fly, *Carcelia illota*

Tachinid fly, *Carcelia illota* is one of the potent parasites of *H. armigera*. It paracitizes the *H. armigera* in 4th to 6th larval instars. One hundred larvae of *H. armigera* were collected from pigeonpea field (August to December, 2012) and chickpea field (December, 2012 to March, 2013). These larvae were reared up to pupation by feeding pigeonpea and chickpea leaves, tender twigs and flowers. The parasitization of *H. armigera* by Tachinid fly in pigeonpea was higher in the month of December (68.3%) and lower in the month of August (5.0%). While in chickpea, higher parasitization was noticed in the month of January (14.5%) and lower in the month of December (2.4%).

A.P. Chavan, V. B. Tilekar, G. P. Deshmukh and P. N. Harer
Mahatma Phule Krishi Vidyapeeth, Rahuri (MS)

Cytological Investigations on Herbicide Treated Seedlings of Pigeonpea and Chickpea

Promising herbicide tolerant and sensitive genotypes of pigeonpea (12-6 and Bahar) and chickpea (ICCV 1205 and IPCK 2002-29) were considered for cytological investigation. Well differentiated germinating roots were treated using post-emergence herbicide Imazethapyr (0.2%) and non-selective herbicide Glyphosate (0.3%) at room temperature for two hours. Treated roots were washed and fixed in Aceto-alcohol (1:2 v/v) and stained using standard protocol. Cytological analysis of meristematic root parts revealed that both the herbicides acted as mitotic disrupter leading to reduced mitotic index and metaphase arrest along with other irregularities such as failure of spindle fiber formation (Fig. 1a, 2a), unusual chromosomal arrangements (Fig. 1b, 2b), absence of telophase

Metaphase Late Metaphase

stage, centromeric dislocations and loss of intercalary and terminal chromosomal segment(s), *etc.* Differential cytological abnormalities with respect to varieties in either of the crops could not be observed but Glyphosate had drastic affect as compared to Imazethapyr. It can be concluded from the present study that normal cell division will be disrupted by herbicide application and lethal and rapid photo oxidative stress may be responsible for injury or mortality of the plants.

N.D. Mazumder, P.S. Basu, M. Aski and S.K. Chaturvedi

Variability for Agronomically Important Traits among Wild Accessions of *Cicer*

To assess the presence of variability among accessions of wild species of *Cicer*, 124 accessions belonging to seven wild *Cicer* species were evaluated for various yield attributes. Study revealed large amount of variability for number of primary branches/plant [3 (*C. cuneatum*) to 28 (*C. reticulatum* and *C. echinospermum*)], number of secondary branches/ plant [13 (*C. cuneatum*) to 49 (*C. pinnatifidum*)] and pods/ plant [31 (*C. chorassanicum*) to 89 (*C. judaicum* and *C. pinnatifidum*)]. Interestingly, accessions belonging to *C. cuneatum* (EC 600098, EC 600100 and EC 600098) had 5-6 seeds/pod as compared to accessions of six other species. These variabilities among the accessions of wild species of *Cicer* belonging to primary, secondary and

Pods showing 6 seeds/pod in *C. cuneatum* (EC 600098)

tertiary gene pools can be utilized in breeding programme following conventional approaches, tissue culture methods and genomics approaches for revolutionizing the chickpea improvement.

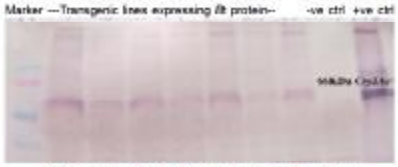
S.K. Chaturvedi, M. Aski, U.C. Jha, Neelu Mishra and N. Nadarajan

New Variety Identified

MH 421: This mungbean variety has been developed from the cross Muskan x BDYR 2. It has been identified for cultivation during summer season in western U.P., northern Rajasthan, Punjab, Haryana and plains of Uttarakhand. It is an early maturing (60 days), high yielding variety and is resistant to mungbean yellow mosaic virus, web blight and cercospora leaf spot diseases with an average yield of 10-12 q/ha. Being early maturing variety it fits well in rice-wheat rotation.

Western Hybridization for Detecting Expression of δ-Endotoxin in Transgenic Pulses

Colorimetric and Chemiluminiscent based detection of Cry1Ac protein have been standardized at Biotechnology laboratory, IIPR, to characterize *Bt* transgenic chickpea and pigeonpea. This method was successfully used to screen the



Chromogenic detection in blot

transgenic chickpea and pigeonpea lines expressing Cry1Ac protein. Besides PCR based detection of transgenes, western hybridization along with quantitaive ELISA is pre-requisite to identify true transgenic lines.

Manoj Kumar Patel, Alok Das, Manoj Kumar, Alok Shukla and Subhojit Datta

Occurrence of Chickpea Rust in Late Planted Chickpea in North India

Total 300 chickpea genotypes (advance breeding lines, germplasm accessions and released varieties) were screened for heat tolerance by delayed (January 15, 2013) sowing ensuring that reproductive phase coincides with high temperature stress. Large amount of variation was observed for heat tolerance. However, genotypes showing delayed maturity or delayed leaf senescence were affected by unknown disease. Based on visual symptoms disease was identified as rust, which is caused by *Uromyces ciceris-arietini*. Diurnal temperature during April-May when crop was in early leaf senescence stage was 42°C (maximum) and 26°C (minimum) with RH of 33.5%. The severity of disease to the tune of 60-70% was observed at crop maturity when day temperature was 35-42°C. The leaves were covered with dark brown to black pustules and later tend to coalescence leading to bigger pustules. Morphology of the spores was studied to confirm disease. Globose to sub-globose shaped, cinnamon coloured, echinulated spores with diameter of 24-26µm indicated nature of uredospores (Fig. 1). Morphology and symptoms (Fig. 2) clearly indicated that disease is caused by *Uromyces ciceris-arietini*. As efforts are being made to popularise

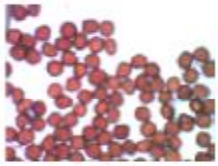


Fig. 1

Fig. 2

chickpea under late sown codition, regular monitoring for development of rust disease need to be ensured and host plant resistance should be exploited to develop rust resistant chickpea varieties.

P.R. Saabale, Muraleedhar Aski and S.K. Chaturvedi

Iron Chlorosis in Chickpea

An experiment conducted at New Research Farm (Alkaline, sandy loam, *Inceptisol*) of IIPR, Kanpur revealed uniform iron chlorosis in newly emerged leaves of chickpea in genotypes *viz*., DCP 92-3 and JG 16 due to high soil pH (8.3) resulting in unavailability of Fe. Analysis of leaf samples revealed lower concentration of total Fe in chlorotic leaves (63.6 µg/g) *vis-a-vis* normal leaves (114.7 µg/g). The visible symptoms were more conspicuous at 60 days following a light splash (rainfall of 6.4 mm) in the middle of January. These symptoms gradually disappeared up to 20 days of its appearance, following a foliar spray of 0.2% $FeSO_4$ and leaf Fe concentration was levelled up (127.7 µg/g). The overall plant growth under iron chlorosis was stunted and leaf size was reduced resulting in reduced biomass and seed yield. The productivity of chickpea can be enhanced through ameliorating high soil pH or application of Fe through foliar sprays.

Ummed Singh, K.K. Hazra, M.S. Venkatesh and C.S. Praharaj

Evaluation of Acaricides for Management of Sterility Mosaic Disease in Pigeonpea

A field experiment was conducted with nine chemicals including acaricides/ insectoacaricides/neem products *viz*., neem oil (3ml/lit), NSKE (5%), fenazaquin (1ml/lit), dicofol (2 ml/lit), propargite (1 ml/lit), spiromesifen (1 ml/l), buprofezin (1 ml/l), fenpyroximate (1 ml/l) and wettable sulphur (3 g/l). The trial was laid out with susceptible variety ICP 8863. Treatments were imposed as prophylactic measure on 40 and 55 DAS.

Foliar spray of fenpyroximate effectively reduced SMD to 11.45%, followed by dicofol (11.68%), fenazaquin (12.23%), NSKE (12.60%), spiromesifen (13.06%) and propargite (14.85%) and they were statistically at par with each other. The untreated control recorded the highest incidence of 32.61% SMD. After second spray, mite population in different treatments ranged between 13.7 to 17.9/plant against 20.8/plant in the untreated plots. The per cent reduction over control after second spray showed that maximum (65.74%) mite population reduction was noticed in fenpyroximate treated plants, followed by dicofol (54.63%) and fenazaquin (50.93%). Regarding grain yield, spray of

Sterility mosaic disease in pigeonpea

fenpyroximate (1ml/l) registered highest yield (739.3 kg/ha), followed by dicofol (734.2 kg/ha) and fenazaquin (722.7 kg/ha). The NSKE treated plots also recorded good yield (718.9 kg/ha). The untreated control recorded lowest grain yield (547.2 kg/ha).

This finding provides alternative options for management of SMD in pigeonpea to choose promising acaricides in place of dicofol to avoid development of acaricidal resistance in mite population due to use of same chemical over the years.

D. Dinakaran, R.P. Soundararajan, N. Chitra and D. Packiaraj
National Pulses Research Centre
Vamban, Tamil Nadu

Changing Scenario of Pod Sucking Bug Damage in Mungbean

A study was conducted for 5 years (2008 to 2012) on damage potential of legume pod borer, *Maruca vitrata* (Lepidoptera: Pyralidae) and pod bugs in mungbean varieties VBN 1, VBN 2 and VBN 3 along with ML 5 as check. After maturity, post-harvest damage counts were collected randomly on 500 pods in each entry and were used to ascertain the per cent damage. During the period, the pod bug

species complex observed in the field were *Riptortus pedestris* F. and *R. linearis* (L.) (Hemiptera: Coreidae) and *Nezara viridula* L. was rarely observed in mungbean.

The results showed that damage due to *M. vitrata* in mungbean varieties gradually decreased from 14.7% in 2008 to 9.04% in 2012. On the other hand, damage due to pod sucking bugs increased from 7.92% to 20.79%.

It is clear from the study that damage by pod sucking bugs is more in the recent years on mungbean varieties replacing the damage by spotted pod borer. The changing scenario or shift in the pest complex may be due to various reasons including the effects of global warming. Hence, further work in the area is necessary to formulate new strategies for management of pod sucking pests to increase the productivity of mungbean.

R.P. Soundararajan, N. Chitra, D. Dinakaran and S. Geetha
National Pulses Research Centre, Vamban, Pudukottai (T N)

New Report on Occurrence of *Fusarium falsiforme* in Chickpea

Occurrence of *Fusarium falsiforme* was studied on wilted chickpea plants of experimental fields. The fungus was isolated from the discoloured vascular tissues of *Fusarium* affected plants. This isolated fungus put up white colonies that were profusely branched comprising of septate and hyaline mycelia. The fungus produced macroconidia, microconidia and chlamydospores. Based on the morphological characters and the growth of fungus, the pathogen was tentatively identified as *Fusarium sp.*

Further investigation of fungal culture at CABI, UK resulted in identification as *Fusarium falsiforme* (IMI No. 501439) on the basis of 99-100% TEF homology with authentic

Growth and pigmentation of *Fusarium falciforme*

samples of *Fusarium falsiforme*. Detailed investigations and monitoring are being carried out to establish the incidence and pathogenicity of *Fusarium falsiforme* in chickpea at UAS, Bangalore.

Muhammad Saifulla and Gowdra Nagamma
UAS, Bangalore

Development of Pre-Treatment-*cum*-Polisher Unit for IIPR Mini *Dal* Mill

The oil/water pre-treatment of pulses gives better *dal* recovery than non-treated, however, it is a cumbersome process. Moreover, the small quantity of unhusked *dal* and dull appearance causes low market price. Keeping in view of these drawbacks,

an in-line pre-treatment-*cum*-polisher unit for IIPR mini *dal* mill was developed for oil/water mixing of pitted pulses. It consists of a 6' long and 3" diameter roller in which screws with 3" pitch were fitted. The speed reduction gear is mounted on the main frame to provide low rpm to screw. Through screw conveyors pitted pulses slowly move forward with the oil/water application at the entry of the conveyor. The refinement of sieve set assembly was also done for better grading, easy sieve replacement and low power consumption. The preliminary testing of this development/refinement gave satisfactory performance.

M. K. Singh, Jagdish Singh and N. Nadarajan

फतेहपुर में मूँग दिवस का आयोजन

आईआईपीआर, कानपुर के गहन प्रयासों के फलस्वरूप फतेहपुर की बिंदकी तहसील में 2006 से मूँग की खेती के क्षेत्र में पर्याप्त वृद्धि हुई है। धान-गेहूँ से आच्छादित क्षेत्र के 70 प्रतिशत से अधिक क्षेत्र में अब धान-गेहूँ-ग्रीष्मकालीन मूँग की खेती की जा रही है। ग्रीष्म ऋतु में, इस संस्थान द्वारा विकसित प्रजाति पी.डी.एम. 139 की खेती क्षेत्रीय किसान व्यापक रूप से कर रहे हैं। संस्थान द्वारा हाल ही में विकसित अन्य प्रजाति आई.पी.एम. 2-3 भी किसानों में लोकप्रिय हो रही है। संस्थान द्वारा विकसित प्रजातियों एवं उत्पादन तथा सुरक्षा सम्बन्धी प्रौद्योगिकियों के प्रसार एवं प्रभाव को प्रदर्शित करने के उद्देश्य से दिनाँक 11 जून, 2013 को अभिनव प्रज्ञान डिग्री कालेज, चौडगरा, फतेहपुर में मूँग दिवस का आयोजन किया गया।

अलीपुर ग्राम में एक प्रक्षेत्र भ्रमण भी कराया गया, जिसमें डा. जे.एस. संधू, कृषि आयुक्त, भारत सरकार, डा. बी.बी. सिंह, सहायक महानिदेशक (तिलहन एवं दलहन), आईसीएआर, अतिरिक्त निदेशक (कृषि), संयुक्त निदेशक (दलहन), कृषि भवन, संयुक्त निदेशक, गन्ना विकास निदेशालय, लखनऊ, डा. एन.पी. सिंह, परियोजना समन्वयक (चना), डा. संजीव गुप्ता, परियोजना समन्वयक (मुलार्प) डा. आदित्य प्रताप, वरिष्ट वैज्ञानिक ने कृषकों के एक दल के साथ मूँग प्रक्षेत्रों का भ्रमण किया। इस दल ने धान-गेहूँ फसल चक्र के अंतर्गत, मूँग की खेती के 25 एकड़ प्रक्षेत्र का भ्रमण किया और खेती को संतोषजनक पाया।

प्रक्षेत्र भ्रमण के उपरांत, डा. जे.एस. संधू की अध्यक्षता में परिचर्चा बैठक का आयोजन किया गया। डा. संधू ने किसानों को सुझाव दिया कि खरीफ, रबी एवं ग्रीष्म की विभिन्न फसल प्रणालियों में संसाधन संरक्षण एवं पोषण सुरक्षा को ध्यान में रखते हुए दलहनी फसलों को सम्मिलित करें। डा. बी. बी. सिंह ने कहा कि किसान ग्रीष्मकालीन मूँग को ज्यादा से ज्यादा क्षेत्र में बोयें एवं संस्थान द्वारा विकसित प्रजातियों को उपयोग में लायें। बैठक में किसानों ने संस्थान द्वारा विकसित प्रजातियों एवं प्रौद्योगिकियों के अंगीकरण पर अपने विचार प्रस्तुत किए। बैठक में प्रश्नोत्तरी सत्र का भी आयोजन किया गया।

विकास कार्यकर्ताओं ने किसानों के लाभ के लिए केन्द्र एवं राज्य सरकार द्वारा प्रायोजित योजनाओं की जानकारी उपलब्ध करायी। प्रतिभागियों को संस्थान द्वारा विकसित साहित्य भी दिया गया। इस कार्यक्रम में 16 गाँवों के 315 किसानों ने भाग लिया। डा. सुशील कुमार सिंह, विभागाध्यक्ष, सामाजिक विज्ञान ने इस कार्यक्रम का समन्वयन किया।

सफलता की कहानी : आय में वृद्धि के लिए गेहूँ के स्थान पर चना की खेती

पैंसठ वर्षीय और दसवीं तक शिक्षित श्री रामस्वरूप उत्तर प्रदेश के बुन्देलखण्ड क्षेत्र के जालौन जिले के काशीखेड़ा गाँव के एक छोटे किन्तु प्रगतिशील किसान हैं। श्री रामस्वरूप के पास 4.25 एकड़ जमीन है जिसमें एकल फसल प्रणाली के अंतर्गत गेहूँ एवं चना उनकी प्रमुख फसलें हैं। कृषक से कृषक विस्तार परियोजना के अंतर्गत, संस्थान द्वारा प्रदर्शन लगाने के उद्देश्य से श्री रामस्वरूप को एक प्रमुख किसान के रूप में चिन्हित किया गया। वर्ष 2009-10 से पूर्व, श्री रामस्वरूप सात एकड़ जमीन पर खेती करते थे, जिसमें से 2.75 एकड़ जमीन उन्होंने ₹ 7000/- प्रति वर्ष/एकड़ पट्टे पर ले रखी थी। रबी के मौसम में वह पाँच एकड़ जमीन पर गेहूँ की खेती करते थे जिससे उन्हें ₹ 66500/- यानि कुल आय का 75 प्रतिशत प्राप्त होता था, जबकि दो एकड़ में चना की खेती करते थे जिससे ₹ 21600/- यानि कुल आय का 25 प्रतिशत प्राप्त होता था। श्री रामस्वरूप स्थानीय बाजार से चना के बीज खरीद कर बोते थे जिससे 15 कु. प्रति हे. की उपज प्राप्त होती थी।

उक्त परियोजना के अंतर्गत वर्ष 2010-11 में श्री रामस्वरूप को चना की प्रजाति डी.सी.पी. 92-3 का 30 कि.ग्रा. बीज जिसे उन्होंने 0.5 एकड़ जमीन में बोया साथ ही उन्हें फसल उत्पादन की तकनीकी जानकारी भी उपलब्ध करायी गई। उन्होंने 0.5 एकड़ भूमि में चना के स्थानीय बीज की

बुवाई की थी। इस तरह उन्होंने एक एकड़ भूमि में चना एवं पाँच एकड़ भूमि में गेहूँ बोया। साथ ही उन्होंने ₹ 7000/- प्रति एकड़ की दर से तीन एकड़ जमीन पट्टे पर ली। चना की उन्नत प्रजाति की उच्च उत्पादकता (20 कुन्तल प्रति हे.) की वजह से उनकी आय प्रर्दशन प्रक्षेत्र (0.5 एकड़) में बढ़कर ₹ 14400/- हो गई।

प्रजाति डी.सी.पी. 92-3 की उच्च उत्पादन क्षमता से प्रभावित होकर वर्ष 2011-12 में उन्होने 6 एकड़ और जमीन में चना की खेती की। इसके लिए श्री रामस्वरूप ने 11.5 एकड़ और जमीन पट्टे पर ली, वो भी अधिक कीमत पर यानि ₹ 8200/- प्रति एकड़ (गत वर्ष से 17 प्रतिशत अधिक)। अच्छे बाजार भाव (4000/कु.) होने से प्रजाति डी.सी.पी. 92-3 की पैदावार से ही उन्हें कुल ₹ 96000/- की सकल आय प्राप्त हुई। चना की खेती से अधिक आय पाने की वजह से श्री रामस्वरूप ने गेहूँ की खेती के क्षेत्र को घटाकर 4 एकड़ कर दिया। इस वर्ष उनकी सकल आय में गेहूँ की खेती से 35 प्रतिशत और चना की खेती से 55 प्रतिशत का योगदान था।

गत दो वर्षों में चना की खेती से प्राप्त ज्यादा लाभ से उत्साहित होकर श्री रामस्वरूप ने वर्ष 2012-13 में 25 एकड़ क्षेत्र में चना की प्रजाति डी.सी.पी. 92-3 की खेती की। इसके लिए उन्होंने 32.5 एकड़ जमीन ₹ 10000/- प्रति एकड़ (पहले से 22 प्रतिशत अधिक) की दर से पट्टे पर ली। इस वर्ष फिर उन्होंने गेहूँ की खेती का क्षेत्र कम करके 2.5 एकड़ कर दिया। इस वर्ष उन्होंने चना की 180 कुन्तल उपज प्राप्त की, जिससे उन्हें 5.4 लाख की आय प्राप्त हुई, जबकि 30 कुन्तल गेहूँ की खेती से ₹ 37500/- की आय प्राप्त हुई। श्री रामस्वरूप आज अपने क्षेत्र के प्रसिद्ध किसान हैं।

इस प्रकार परियोजना के तीन वर्ष में अर्थात 2010-11 से 2012-13 के दौरान चना की उन्नत प्रजाति के प्रयोग से श्री रामस्वरूप एक एकड़ की जगह 25 एकड़ क्षेत्र में चना की खेती करने लगे और फलस्वरूप चना का उत्पादन 8 कुन्तल से बढ़कर 180 कु. हो गया और कुल आय ₹ 14400/- से बढ़कर ₹ 5,40,000 हो गई। चना की इस प्रजाति डी.सी.पी. 92-3 से प्रभावित होकर, श्री रामस्वरूप अगले वर्ष चना की खेती और बड़े पैमाने पर करना चाहते हैं और वह अन्य किसानों को भी चना की खेती करने के लिए प्रेरित करेंगे।

उच्च उत्पादकता, कम उत्पादन लागत और अच्छे बाजार भाव आदि कारणों की वजह से, श्री रामस्वरूप ने चना की प्रजाति डी.सी.पी. 92-3 की खेती इतने बड़े पैमाने पर की।

उमा साह, नरेन्द्र कुमार, हेम सक्सेना एवं सुशील कुमार सिंह

Personnel

Appointment

Name	Post	Date of joining
Mr. Nand Lal Meena	Scientist (Biochemistry)	10.4.2013

Promotion

Name	Promoted to	*W.e.f.*
Mr. Indra Bahadur	T-1	28.5.2013
Mr. Amar Nath	T-1	10.6.2013
Mr. Babu Lal	T-1	17.6.2013

Transfer

Name	Post	From	To	*W.e.f.*
Dr. K.K. Singh	Principal Scientist	IIPR, Kanpur	IIPR Regional Station, Bhopal	3.4.2013
Dr. D.N. Gawandey	Scientist	IIPR, Kanpur	IIPR Regional Station, Bhopal	27.4.2013
Mr. Vijendra Singh	Technical Officer (T 7/8)	IIPR, Kanpur	IIPR Regional Station, Bhopal	25.4.2013
Mr. Satish Kr. Singh	Technical Assistant (T 4)	IIPR, Kanpur	IIPR Regional Station, Bhopal	15.5.2013
Dr. Revanappa	Scientist	IIPR, Kanpur	IIPR Regional Station, Dharwad	12.6.2013

Retirement

Name	Post held	Date of retirement
Dr. R.G. Chaudhary	Principal Scientist (Plant Pathology)	30.4.2013
Mr. R.P. Singh	Technical Officer (T 5)	29.6.2013

Obituary

Mr. Rajesh Kumar, Jr. Clerk, left for heavenly abode on May 5, 2013. May his soul rest in Peace.

Director's Desk

Dear Readers,

The production of pulses in the country has witnessed an upward trend during the last three years and it has consistently remained at about 18 million tons since 2010. The latest production figure of 18.45 million tons for the year 2012-13, an all time high record, is really encouraging and exhorts us to put more efforts to further improve this figure in future. It appears to be a revolutionary movement for the country towards achieving self sufficiency in pulses production which has been a long pending demand. Not looking far beyond, the scenario was entirely different during the 1st decade of this century when the total production of pulses was continuously stagnating at around 14-15 million tons, and was about 2-3 m t short of the national demand. The deficit was compensated by import of pulses from other countries bearing a heavy burden on the public exchequer. Consequently, efforts to boost up the production and minimize the import were always a serious concern. However, it is also a hard fact that with shrinking agricultural land and scare natural resources, pulses could not find suitable areas for expansion. Further, there was massive geographical shift of potential areas from northern plains to central and southern part of India. Therefore, increasing the production of pulses within limited land and resources always remained a challenge. Today, effective area under pulses cultivation in the country is estimated to be about 25-26 million hectares while the realized productivity is less than 1 ton per hectare. Nevertheless, despite all odds and natural adversities, the country has achieved this once again impressing upon the fact that we can do it. It is high time now that we look back and analyse the factors and mechanisms that played a significant role in bringing this transformation on production front so that we may repeat this success for a sustained growth of pulses.

Besides soil and climatic factors, non-availability of quality seeds in adequate quantity was one of the major constraints in pulse production. Seed replacement rate was also very low (5 to 10%) and recurrent unfavorable weather conditions and gaps in technological know-how further added to the constraints in pulses production. Realizing this, with technological back up and interventions of National Agricultural Research System and well planned financial support of Planning Commission and Ministry of Agriculture, Govt. of India, several programmes *viz.*, National Food Security Mission–Pulses, Accelerated Pulses Production Programme (A3P), Rashtriya Krishi Vikas Yojna (RKVY), 60000 Pulses Villages, *etc.* were launched during the XI Plan period to boost pulses production in the country with an objective to add 2 million tons additional production.

Situation-specific, cost effective and system-based technological know-how and packages of pulses have been disseminated among the farmers through farmers' participatory research and extension (FPRE), on–farm demonstrations, front line demonstrations, and skill based training to bridge the gap between potential and realized yield. Inclusion and adoption of improved varieties of different pulse crops under different farming systems has also helped in increasing productivity per unit area. The policy initiatives such as increasing the minimum support price by the Government also encouraged the farmers to take up pulse cultivation as a profitable venture.

Ministry of Agriculture, GoI, New Delhi has entrusted Indian Institute of Pulses Research, Kanpur the responsibility of achieving national targets of pulse production through basic, applied and strategic research and also facilitating the NARS of the country. Under the National Food Security Mission-Pulses component, IIPR was assigned the task of enhancing breeder seed production of pulses and strengthening training infrastructure and organization of national training programmes. With these initiatives and implementation of a mega seed project, the breeder seed production has doubled which ensured availability of quality seed of pulses in sufficient quantities. The seed supply model has been practically successful and it led to one important step forward towards this transformation. Technology demonstration programme for harnessing pulses production was launched in the year 2010 through active collaboration of IIPR and Division of Agricultural Extension, ICAR, New Delhi. With networking of 137 KVKs of 11 states of country, 6000 demonstrations on pulses were laid out on package technologies. All these efforts together resulted in yielding encouraging results and enhancing pulses production in the country. Beside the above, moderate to good monsoon and effective farm-oriented government policy support also had their share in this success.

While we can rejoice this historical landmark, it is not a time to be complacent, since India still has a mammoth task of producing about 30-32 million tons of pulses by 2030 which requires an annual growth rate of about 4.2%. This means, we still have to travel a long way. We have to learn from our past experience and envisage newer strategies to increase production of pulses to achieve self-sufficiency for all times. Horizontal expansion in area by bringing newer niches such as rice and wheat fallows under pulse cultivation, vertical expansion through more effective seed and varietal replacement, development of pulse-based cropping systems, intercropping and relay cropping, resource conservation technologies, use of genomic tools and transgenics, effective post-harvest management, farm mechanization, technological and infrastructural support, policy initiatives and proper storage and disposal of pulse produce are some of the key areas which require concerted efforts and will be able to address most of the production related issues in pulses. Nonetheless, this will require integrated and missionary effort of planners, administrators, researchers, extension workers and developmental agencies, who can together translate the vision into reality.

(N. Nadarajan)

Published by Dr. N. Nadarajan, Director, Indian Institute of Pulses Research, Kanpur-208 024
Tel. : 0512-2570264; EPBAX Lines : 0512- 2572464, 2572465; Fax : 0512-2572582
E-mail : director@iipr.ernet.in ; n.nadarajan@gmail.com; Website; http://www.iipr.res.in

Printed at Army Printing Press, 33, Nehru Road, Sadar Cantt. Lucknow-226 002. Tel. : 0522-2481164, 6565333