BRNS-BCKV joint venture
Preamble
After successful holding of the conference on "Nuclear Intervened Agriculture" and the "Technical Programme Discussion Meeting" of BRNS, Barasat Atomic Research Centre, Govt. of India during 7-8 March, 2013, it was decided from the BRNS, BARC side to send a high power team to BCKV to inspect the logistic available at BCKV and to hold the inaugural meeting with a view to establish the "Regional Nuclear Agricultural Research Centre" at Bidhan Chandra Krishi Viswavidyalaya on April 19, 2013.

Proposed site of Regional Nuclear Agricultural Research Centre
The high power team of BRNS, BARC, Govt. of India constituted by Shri S. G. Markandeya, Scientific Secretary, BRNS, Dr. S. E. Power, Former Scientific officer, BARC, Dr. Lalit Varshney, Member secretary, BRNS, Dr. A. K. Kohli, Chief Executive BRIT, BARC and Dr. Subrata Dutta, Programme Officer, BARC were highly satisfied seeing the proposed building at BCKV, Mohanpur for the establishment of "Regional Nuclear Agricultural Research Centre".

Inaugural meeting to establish the "Regional Nuclear Agricultural Research Centre"

In the inaugural meeting held on 19 April, 2013 at Farmers Training Centre, Bidhan Chandra Krishi Viswavidyalaya, Kalyani, Shri Malay Ghatak, Minister-In-Charge, Department of Agriculture, Govt. of West Bengal was the Chief Guest and Prof. Chittaranjan Kole, Vice-Chancellor, BCKV presided over the function.

Prof. Biswajit Mandal, Pro-Vice-Chancellor, Bidhan Chandra Krishi Viswavidyalaya welcomed the delegates and highlighted the importance of establishing the Regional Nuclear Agricultural Research Centre at Bidhan Chandra Krishi Viswavidyalaya.

Shri S. G. Markandeya, Scientific Secretary, BRNS in his speech said that the Regional Nuclear Agricultural Research Centre at Bidhan Chandra Krishi Viswavidyalaya will be the first in the Eastern India.

Dr. S. E. Pawar emphasized the need of fine tuning of the pilot projects that will be sanctioned with the proposed Regional Nuclear Agricultural Research Centre at Bidhan Chandra Krishi Viswavidyalaya.

Dr. Lalit Varshney, Member secretary, BRNS, Dr. A. K. Kohli, Chief Executive BRIT, BARC and Dr. Subrata Dutta, Programme Officer, BARC emphasized the importance of BRNS-BCKV collaborative platform for harnessing research and developmental activities on nuclear agriculture in the University and Eastern India as a whole.

The Chief Guest, Shri Malay Ghatak, MIC, Department of Agriculture, Govt. of West Bengal emphatically mentioned that Government of West Bengal is very serious regarding physical availability and economic accessibility of food which are the most important criteria of food security. He expressed his concern about the plateau and some time decline in the production of many food crops. He mentioned that Government is aware that use of nuclear tools for agricultural research is important to make quantum jump in food front. Induced mutations have played a great role in increasing world food security, since new food crop varieties embedded with various induced mutations have contributed to the significant increase of crop production at locations people could directly access. He assured that Govt. of West Bengal will render all sort of cooperation required for the establishment of the Regional Nuclear Agricultural Research Centre at Bidhan Chandra Krishi Viswavidyalaya, one the leading agricultural University in the country.

In his Presidential address, Prof. Chittaranjan Kole, Vice-Chancellor, BCKV said that while the first green revolution had taken place through high yielding varieties, the second green revolution will happen through the use of nuclear technology and it would be "Ever green revolution".

The programme ended with the vote of thanks given by Prof. P. Hazra, Dean, Faculty of Horticulture and Convener, BRNS-TDPM programme.

It was principally agreed upon that the proposed Regional Nuclear Agricultural Research Centre will be established at Bidhan Chandra Krishi Viswavidyalaya with the following broad research areas in the form of "Pilot Project":

- Molecular characterization of mutants
- Pesticide residue analysis through radioactive tracer technology
- Enhancement of phyto-medicines through nuclear intervened molecular breeding
- Improvement of shelf-life of perishables (fruits, vegetables, fish, meat) through irradiation
- Improvement of nutrient use efficiency of crops through radioactive tracer technique
- Alleviation of heavy metal toxicity of sludge through irradiation
- Improvement phenolic antioxidant properties of medicinal plants through irradiation
- Applied mutagenesis in crop improvement

The modalities of the Memorandum of Understanding (MOU) that will be signed between Bhabha Atomic Research Centre, Trombay, Mumbai and Bidhan Chandra Krishi Viswavidyalaya and Board of Research in Nuclear Sciences, Department of Atomic Energy, Mumbai on Establishment of Regional Nuclear Agricultural Research Centre at BCKV, Mohanpur, West Bengal will be decided in the next meeting preferably in the month of May this year.

The news on the meeting under the headlines "Nuke Agri Research Centre to come up at BCKV" and "A first in east, Bengal to set up nuclear agri research centre" were covered widely by a number of print and electronic media namely Anandabazar Patrika, Bartaman Patrika, The Statesman, The Indian Express, Business standard, IBN and News Time.

Published by : Information, Press & Publicity Committee, BCKV

Editors : Dr. P.K. Mani and Dr. D. Mazumdar

BARC-BCKV Initiative
BARC-BCKV platform
Use of nuclear strategies and tools for agricultural research is important to augment food production and ameliorate quality of different food crops. However, facilities for such tools are hardly available in Eastern India. Moreover, very few research projects on this aspect are being implemented in the Universities/Institutes in this part of country. Although, huge potentialities exists in different areas of a) Extension of shelf life of perishables like, fruits, vegetables, fish and meat using radiation technology; b) Extension of shelf life of perishing quality of fruits, vegetables, fish and meat using radiation technology; c) Increasing use-efficiency of applied nutrients with radioactive tracer technology; d) Improving traits in crop improvement using molecular breeding; e) Applied mutagenesis for improvement of pulses, flower and vegetable crops; f) Radiation technology for enhancing the level of bioactive compounds in medicinal plants, etc.

In an attempt of creating such facilities in Bidhan Chandra Krishi Viswavidyalaya in particular and Eastern India as a whole a conference on "Nuclear-intervened Agriculture" sponsored by Board of Research in Nuclear Science, Bhabha Atomic Research Centre Govt. of India, was hosted by Bidhan Chandra Krishi Viswavidyalaya at the Farmers’ Training Centre, Kalyani.
on March 7-8, 2013. On this occasion, two day RTAC-BRNS Technical Programme Discussion Meeting was also be held for formulating project proposals of relevance to DAE and the participating Institutes in the conference.

**Inaugural programme**

In the inaugural programme held on 7 March 2013 at Farmers Training Centre, Bidhan Chandra Krishi Viswavidyalaya, Kalyani, Shri Sekhar Basu, Director, BARC was the Chief Guest and Prof. Chittaranjan Cole, Vice-Chancellor, BCKV presided over the function.

Prof. Biswapat Mandal, Pro-Vice-Chancellor, Bidhan Chandra Krishi Viswavidyalaya welcomed the delegates and highlighted the perspective of BARC-BCKV Technical Programme meeting.

Shri Sekhar Basu, Director, Bhabha Atomic Research Centre stressed the use of nuclear science in different research and developmental activities including agricultural science. He delivered on the wide array of research and developmental activities of Bhabha Atomic Research Centre where 4200 scientists are engaged in relentless activities on various aspects like, hydrology, water purification, efficient composting, nuclear medicine, extension of shelf life of perishables like fruits, meat, fish, etc. in agriculture. He reminded that so far 41 high yielding varieties of different crops like, ground nut, moong bean, black gram, rice, etc. have been developed from BARC. He assured that BARC will extend all sort of help to establish “Regional Agricultural Research Centre” at Bidhan Chandra Krishi Viswavidyalaya.

Dr. S. P. D’Souza, Associate Director, Bio-Medical Group at Dr. Homi Bhabha Atomic Research Centre, BARC discussed the role of Nuclear Tools for Improvement in Food Front. He emphasised that both BRNS-funded projects are being carried out in BCKV University and definitely more will be sanctioned after this Technical Programme Discussion Meeting.

Prof. A. C. Sinha, Vice-Chancellor, Uttar Banga University (BCKV) for facilitating the Inaugural programme of the conference. In this Technical Programme Discussion Meeting held on 7-8 March, 36 project proposals were presented under six theme areas before the panel of experts from both BARC and BCKV side.

**BRNS-TPDM**

BRNS Technical Programme Discussion Meeting started from 2.00 p.m. on 7 March and continued upto 7.30 p.m. The meeting started at 9.30 am on 8 March and continued upto 5.30 p.m. Through this course of TPDM, 36 project proposals from nine Universities/Research Institutes viz. Uttar Banga Krishi Viswavidyalaya, West Bengal University of Animal Science and Fishery, Bihar Agricultural University, Kalyani University, Calcutta University, Visva-Bharati, Burdwan University, CRIFAR, and Bidhan Chandra Krishi Viswavidyalaya was presented and subsequently discussed.

**BRNS-TPDM** started with the welcome address by Prof. P. Hazra, Dean, Faculty of Horticulture and Convenor, BRNS-TPDM. Later, Dr. Lait Vashishe, Member Secretary, RTAC/BRNS, Prof. S. S. Kale, Nuclear Agriculture & Biotechnology Division, BARC and Dr. Subrata Dutta, Programme Officer, BARC, made their remarks on the current status of TPDM and prospects of holding the TPDM at BCKV. In this Technical Programme Discussion Meeting held on 7-8 March, 36 project proposals was presented under six theme areas before the panel of experts from both BARC and BCKV side.

**Expert members from BARC side**

Dr. Subrata Dutta, Programme Officer, BARC 
Dr. S. De, Member Secretary, BRNS 
Dr. S. Gautam, Head, Food Science and Safety Section, Food Technology Division, BARC 
Dr. S. Jambhulkar: Senior Scientist, Plant Biotechnology and Secondary Products Section, Nuclear Agriculture & Biotechnology Division, BARC 
Dr. S. P. Kale: Technology Transfer and Collaborative Division, Nuclear Agriculture & Biotechnology Division, BARC

**Expert members from BCKV side**

Prof. C. Kole, Vice-Chancellor, BCKV 
Prof. Biswapat Mandal, Pro-Vice-Chancellor, BCKV 
Dr. Himadri Sen, Former Director, CRIFAR 
Dr. Asit Pal, Professors, OUAT, Bhubaneswar

**Protective mechanisms of soil-phosphorus on yield**

A team of scientists from different Institutes presented under six theme areas before the panel of experts from both BARC and BCKV side. The projects proposals under different theme areas were Mutational analysis of calmodulin-binding protein gene family involved in abiotic stress responses in rice and Arabidopsis, Identification and characterisation of radiation-induced microRNA in Phaseolus vulgaris, Genetic improvement of Limonium through Induced in vitro Mutagenesis and Molecular Characterization of Mutants, Application of Induced Mutation for development of Improved Drought and Salt Tolerant Rice lines, Radiation induced mutation for early duration, high yield and high lignin content in white seeded sesame (Sesamum indicum L.) and their molecular characterization, Use of radio isotopes towards regulation of fluoride movement into the plant body (Molecular characterization of mutant lines in medicinally important plants), Characterization of calmodulin for colchicine action in plants.

**The project proposals under different theme areas**

- **Mutational analysis of calmodulin-binding protein gene family involved in abiotic stress responses in rice and Arabidopsis**: Identification and characterisation of radiation-induced microRNA in Phaseolus vulgaris, Genetic improvement of Limonium through Induced in vitro Mutagenesis and Molecular Characterization of Mutants, Application of Induced Mutation for development of Improved Drought and Salt Tolerant Rice lines, Radiation induced mutation for early duration, high yield and high lignin content in white seeded sesame (Sesamum indicum L.) and their molecular characterization, Use of radio isotopes towards regulation of fluoride movement into the plant body (Molecular characterization of mutant lines in medicinally important plants), Characterization of calmodulin for colchicine action in plants.

**Mutagenic studies in papaya for development of new cultivars**

Mutagenic studies in papaya for development of new cultivars of aromatic rice genotypes of northern part of West Bengal through induced mutation (Application for improvement of crop plants).

**Impact of gamma irradiation for improvement of phenolic and medicinal property of Aegle marmelos**

Study on the effect of radiation-induced mutation on the performance of cashew varieties, Variation of mutant with synchronization in flowering, better resistance to diseases and longer shelf life in pointed gourd, Development, Characterization and utilization of radiation-induced mutation in (Lathyrus sativus L.) mutants with lower levels of neurotoxin, Improvement of β-glucan content in high yielding variety of barley through mutation breeding, Improvement of Chrysanthemum and Tuberose by applied mutagenesis, Isolation of low fibre and high volatile content ginger types by applied mutagenesis, Mutagenic studies in papaia for development of new varieties, Improvement of traditional non-biennial aromatic rice genotypes of northern part of West Bengal through induced mutation (Application for improvement of crop plants).

**Benefit of shrubs in the System of Rice Intensification**

Project proposals presented in one Technical Programme Discussion Meeting of BRNS, BARC, Govt. of India which amply indicated the enthusiasm among the scientists of BCKV and other Universities/Institutes of Eastern India on different aspects of nuclear agriculture. It was assured from the BRNS, BARC side that as many number of projects as possible will be sanctioned phase-wise so that researchers of BCKV and other Universities/Institutes of Eastern India and other Universities/Institutes of Eastern India will be benefitted for carrying out research programmes on different aspect of nuclear science in agricultural research. Research activities in this field will get immense fill-up after the proposed project. The infrastructure facilities will be created in the form of “Regional Nuclear Agricultural Research Centre” at Bidhan Chandra Krishi Viswavidyalaya as the fall out of the conference and Technical Programme Discussion Meeting of BRNS, BARC, Govt. of India.