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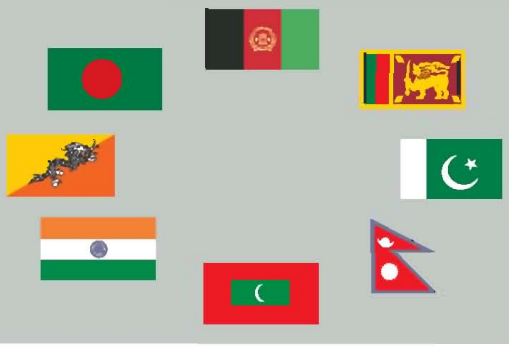

SAARC AGRINEWS

Promotion of Agricultural Research and Development in South Asia

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Highlights

Consultation Meeting on

Operational Agro Meteorological Services in SAARC and Other Countries in Regional Association (RA) II Region

Agricultural Meteorology Division, India Meteorological Department (IMD), Pune, World Meteorological Organization (WMO), Geneva and SAARC Agriculture Centre (SAC), Bangladesh jointly organized the Consultation Meeting on "Operational Agro Meteorological Services in SAARC and Other Countries in Regional Association (RA) II Region" at National Meteorological Training Institute, Pune from 20-21 April 2012.

A number of high level dignitaries such as Dr. A. K. Azad, Director, SAC; Mr. Robert Stefanski, Chief, Agricultural Meteorology Division, WMO; Prof. R. R. Kelkar, Former Director General of Meteorology, IMD; AVM (Dr.) Ajit Tyagi, Former Director General of Meteorology, IMD; and Permanent Representative of WMO, Government of India; Dr. K. J. Ramesh, Scientist G, Ministry of Earth Sciences, Government of India; Shri S. Krishnaiah, Deputy Director General of Meteorology (Surface Instruments), IMD, Pune; Shri B. Mukhopadhay, Deputy Director General of Meteorology (HRD) & Scientist F, IMD, New Delhi; Dr. N. Chattopadhyay, Head, Agricultural Meteorology Division, IMD, Pune; Dr. S. K. Pal, Deputy Director (Agriculture), SAC; Dr. S. D. Attri, Deputy Director General of Meteorology (International) and Scientist E, IMD, New Delhi; Dr. S. Venkataraman, Former. Director, IMD, Pune; Dr. S. Sardesai, Scientist G, National Informatics Centre (NIC), Pune; Dr. H. P. Das, Former Deputy Director General of Meteorology (Agrimet), IMD and number of Scientists / Officers from Meteorological Services of SAARC and Non SAARC countries in RA II region participated in the meeting.

The objective of the meeting was to share the ideas and understanding of agromet advisory services among the agrometeorologists from SAARC and Non-SAARC countries in the RA-II which would ultimately boost the agricultural activities and also benefit both the group of countries. Extensive discussion was made to effectively integrate the skills of operational, experimental, theoretical aspects of agricultural meteorology and their possible development for the purpose of making the agriculture production system in the country in general more robust.

Dr. N. Chattopadhyay heartily welcomed the dignitaries and participants from different parts of the RA II region. He complimented the SAC and WMO for their support in organizing the meeting as it is the need of the hour to make a sensible programme in Agromet Advisory Service in the countries in Asian region. He informed the participants that the aim of the meeting was to discuss different aspects of Agromet Advisory Services (AAS), share ideas and understanding of AAS in SAARC and Non SAARC countries. Dr. Chattopadhyay noted that IMD has achieved several milestones in AAS with the active support of the Ministry of Earth Sciences (MoES), Government of India and also in collaboration with number of organizations under Public Private Partnership (PPP) mode. He also informed that there would be three sessions followed by discussion on operational AAS at different SAARC and Non-SAARC countries and recommendations would be made which may be applicable to the neighbouring countries.

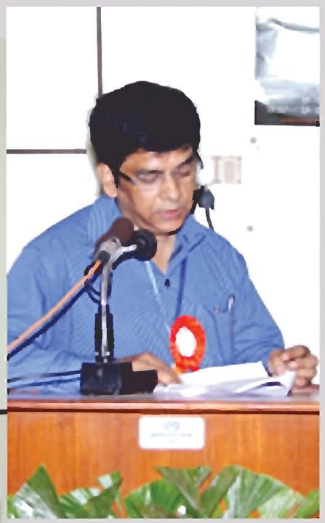
Shri S. Krishnaiah mentioned that economy of most of the countries of the world is dependent on agriculture and development of agriculture has direct bearing on the economy of the country. He said that an exclusive Division for Agricultural Meteorology was set up in IMD in 1932 in Pune with an objective of minimizing adverse weather impact and make benefit of favourable weather. Shri S. Krishnaiah also mentioned that Integrated Agromet Advisory Services started in India in 2007 in collaboration with ICAR, Ministry of Agriculture and different stake holders for implementing the services and also added that IMD is working with RA II of WMO for sustainable development in agriculture. He added that initiation of WMO in the development of operational Agrometeorology is highly beneficial for the countries of RA II region and this has started a new era for operational agrometeorology. He also added that the objective of the meeting would be sharing of ideas and educate each other for benefit of other countries in RA II region and the meeting would be able to create a new era of partnership in these the countries.

AVM (Dr.) Ajit Tyagi extended heartiest welcome to all the delegates. He mentioned that with the success of AAS, during next five year plan, AAS in India would reach at block level. Dr.Tyagi also said that Pune is city of learning and Agricultural Meteorology Division is the true example for operationalization of District level Agromet Advisory Service. He wished that during the two days meeting the experiences to be gained in AAS among the participating countries would be shared and the recommendations and action plan of the meeting would be directly benefiting the countries.

Prof. R. R. Kelkar briefly described the history of Agricultural Meteorology in India. He said that as most of the Asian countries are affected by drought, floods, tropical cyclones etc. and there would be much of impact of climate change in food security in Asian countries, the RA II countries would have tremendous responsibilities and important role from the view point of food security. He has also discussed about the status of food production in India in last two years in relation to the spatial and temporal distribution of monsoon rainfall. Prof. Kelkar stressed for the need of proper education of farmers under the changing weather scenario. He said that he is very hopeful that two different bodies i.e. RA II and SASCOF (South Asian Climate Change Outlook Forum) would come together and come out with some good strategy for increased production.

Mr. R. Stefanski said that weather forecasting is important aspect of Agricultural Meteorology specifically in AAS. He said that IMD and the AASs are providing a valuable service to farmers. He added that weather and farming are related and operational agro meteorology has much scope to explore the relation for higher crop productivity. Mr. R. Stefanski said



that IMD's medium range weather forecasting and AAS of 5-7 days help the farmers to take decisions on day-to-day agricultural operations and that this is an excellent example of operational agromet. He also informed that dissemination on climate forecast for a season and their application in agriculture would be explored jointly by IMD and WMO. He stated that member countries of RA II would benefit the most out of the meeting and would be able to start issuing sensible Agromet Advisory Services in their countries.

Dr. A. K. Azad said that the SAARC Agriculture Centre has started in 1988 for policy planning and management of agriculture. According to him, weather based AAS and technology development for dissemination of Agromet advisories are some of the objectives of the centre. Dr. Azad informed that SAC has initiated a programme on impact of climate on agriculture in SAARC countries and to reduce the negative impacts and to take corrective steps and capacity building for the same. He appreciated the AAS activities in India which already shared these experiences with neighbouring countries. He also advised that if recommendations of the meeting are implemented, there would be scope to minimize the losses. He hoped that India would take a lead in this regard in future also.

Dr. S. D. Attri has read the message of Dr.L.S.Rathore, Director General of Meteorology, IMD, New Delhi. At the outset, Dr. Rathore complimented both WMO and SAC for extending support in organizing the meeting. He communicated that this meeting would lead the way to deliver the weather information to the farmers in the Asian region. He also informed that weather and climate information would help to reduce the impact of adverse weather. According to him, modernization of IMD has considerably improved with the AAS and Agro AWS data particularly of leaf wetness duration would help to forecast disease at certain stations. He also said that Doppler Weather Radar data would be useful for forecasting at some stations. He also informed the august gathering that using improved observations, IMD has been able to generate district level weather forecast and generate advisories and to disseminate the advisories to about 3 million farmers by SMS and other modes. According to him under changing climate, IMD, WMO and SAARC have to work jointly to try to solve the future problems. He stressed for more collaboration among IMD, WMO and SAARC and the countries in RA II region.

Dr. A. Kashyapi, Scientist E, IMD, Pune proposed the vote of thanks. In this meeting sixteen presentations along with the discussion were made in three technical scssions.

In the Technical Session-I, nine important presentations were made with the theme on "Operational Agromet Advisory Services in SAARC countries" by Dr.S.K.Pal, Dr.M.Mondal, Shri Jhanaki Prasad Khanal, Dr. M.N.Alam (on behalf of Dr. M. Asim), Dr. H. K. Kadupitiya, Dr. A. M. Ramiz, Dr. Chimmi Wangda, Dr. Mohammed Abdul Mannan and Dr. N. Chattopadhyay.

Technical Session-II was arranged as joint session with SASCOF (South Asian Climate Change Outlook Forum) organized by IMD and Indian Institute of Tropical Meteorology (IITM) and WMO during the same period. In this session Dr.D.S.Pai, Scientist E and Head, Long Range weather Forecast Division, IMD, Pune and Smt (Dr.) Sulochana Gadgil made a presentation on "Seasonal climate forecasting and agriculture in SAARC countries".

In Technical session III, Mr. Robert Stefanski, Mrs. Valeyeva Dilya (Uzbekistan), Mrs. B. Erdenetseteg (Mongolia), and Mr. Ngo Tien Giang (Vietnam) made presentations on "Operational Agromet Services in Non-SAARC countries in the RA II region". As a Guest lecture, Dr. S. Venkataraman,

Former Director, IMD, Pune has gave a presentation on requirement of providers and users of Agromet Advisory Services. After each presentation there was discussion among the participants of the meeting from the view point of improvement of Agromet Advisory Services particularly in the countries where it has not been established as per the requirements of the users. The salient points emerged out of the discussion has been properly considered in the recommendation and the action plan in the penultimate session of the meeting. This was followed by the panel discussion to frame the recommendations and action plan.

RECOMMENDATIONS AND ACTION PLAN:

Based on the agreement of the panel of experts, recommendations and action plans were made on the four major areas: 1. Weather Forecasts 2. Agromet Advisory Services 3. Dissemination 4. Policy issues

1. Weather Forecasts

A. Recommendation: Available weather forecast products may be shared amongst the countries in the RA-II region (SAARC and Non-SAARC countries) for preparation of Agromet Advisories.

Action Plan: Regional Forecasting Centres may generate the forecast and share the products with the neighboring countries.

Period of Implementation: Six months to one year.

B. Recommendation: Medium Range Weather Forecast (MRWF) for 5-7days may be developed for use in AAS.

Action Plan: WMO and Regional Centres should assist the lead countries in developing MRWF for all the countries in the region

Period of Implementation: Within 3 years

2. Agromet Advisory Services

A. Recommendation: There is need to establish AAS centres in each country.

Action Plan: Each country should submit proposal including technical and financial requirement to the respective Government. Permanent Representative of WMO of each country may initiate the process to form a steering committee (involving the Departments of Agriculture, Meteorology and allied Departmentsetc.) that will identify the appropriate persons to prepare the proposal.

Period of Implementation: 6 months

B. Recommendation: There should be appropriate manpower available in the Agromet Division.

Action Plan: Steering committee to propose to the concerned Ministry regarding the manpower recruitment (both technical and supportive).

Period of Implementation: One year

C. Recommendation: Arrangement may be made for proper infrastructure in the Agromet Division

Action Plan: Construction of building and setting up of state of art instruments may be included in the project proposal submitted to the concerned organization.

Period of Implementation: 3 years

D. Recommendation: Arrangement may be made for Capacity Building in Forecasting and Agrometeorology.

Action Plan: WMO and Regional Centres should assist in Capacity Building in forecasting as well as preparation of agromet advisories.

Period of Implementation: Three Years

3. Dissemination

A. Recommendation: Proactive initiative may be started to disseminate the agromet advisories through Mass media, Internet, mobile & Extension services.

Action Plan: Implementing organization may develop linkages with collaborative organizations as well as private firms to disseminate the advisories.

Period of Implementation: Two Years

B. Recommendation: There is need to develop feedback mechanism to assess the agromet advisories.

Action Plan: A system may be developed to get the accuracy of the forecast and advisories issued to the users from different stake holders and even users also. State of art technology may be used in obtaining the feedback.

Period of Implementation: Two Years.

4. Policy issues

A. Recommendation: There is need to raise awareness on importance and benefits of AAS.

Action Plan: Exchange of available information / brochure, exposure visits and meeting with SAARC and other countries of RAII region particularly in India.

Period of Implementation: Two Years

B. Recommendation: National and International collaboration on AAS may be initiated.

Action Plan: MOU with different national/international organizations and also private firms may be signed to strengthen the AAS and also encourage developing collaborative projects with WMO, SAC and other organizations in this regard.

Period of Implementation: Three Years

C. Recommendation: Review and refinement of existing policies.

Action Plan: If needed, concerned department of the country in the RA II region may consult and convince the competent authority to review and refine the existing policies.

Period of Implementation: Two Years

Third Meeting of SAARC Seed Forum

SAARC Agriculture Centre (SAC) and Seed Wing, Ministry of Agriculture (MoA), Government of Bangladesh jointly organized the Third Annual Meeting of SAARC Seed Forum (SSF) on 4 April 2012 at SAC Conference Room. Matia Chowdhury MP,

Honourable Minister, Ministry of Agriculture, Government of Bangladesh attended the inaugural session as Chief Guest and the inaugural session presided over by Mr. Anwar Faruque, Director-General, Seed Wing, MOA and Convener, SSF.

Dr. Abul Kalam Azad, Director, SAARC Agriculture Centre gave welcome address to all the partieipants. Dr. Nazmul Huda, Member Secretary, SSF presented keynote paper in the inaugural session. Members of SSF from SAARC member countries and members from Bangladesh Seed Association participated in the meeting. The meeting discussed the following issues

- Finalization of constitution and bylaws
- Set future activities including member enrollment
- Project formulation for funding from donors for SSF support

The 6th *Governing Board Meeting* of SAARC Agriculture Centre (SAC)

The SAARC Agriculture Centre is going to organize the Meeting of 6th Governing Board (GB) during 3-4 September 2012. The Centre is expecting honourable GB Members from SAARC Member Countries in the Meeting. The Meeting would be declared open by the honourable GB Chairperson from Government of Pakistan.

Training

- Mr. Md. Golam Mustafa, Programme Officer (Fisheries) attended in Training course on "e-Governance in Agriculture" during 1-5 April, 2012. Bangladesh Agricultural Research Council (BARC), Farmgate, Dhaka.
- Mr. Nure Alam Siddiky, Programme Officer (Livestock) attended a training course on "Technical Report Writing and Editing" held during February 2012 organized by Agricultural Information Centre, Bangladesh Agricultural Research Council (BARC), Bangladesh
- Mr. Iqbal Karim, Store and Procurement Officer of SAC attended training on "Public Procurement and Management" during 2-7 April 2012 organized by Bangladesh University of Engineering and Technology.

Professional Development

- Mr. Nure Alam Siddiky, Programme Officer (Livestock) attended in a programme on "Annual Scientific Conference of Bangladesh Society for Veterinary Microbiology and Public Health (BSVMPH)" held on May 19, 2012 at Bangladesh Agricultural University, Mymensingh.
- Mr. Md. Golam Mustafa, Programme Officer (Fisheries) attended in a programme on "National Strategic Workshop on Governance of Marine Small-Scale Fisheries in Bangladesh" during 29-30 April, 2012 organized by DOF and BOB-IGO at BARC as resource person.
- Ms. Nasrin Akter, Senior Programme Officer (Crops Management), Mr. Nure Alam Siddiky, Programme Officer (Livestock) and Mr. Md. Golam Mustafa, Programme Officer(Fisheries) attended in a Training course on "Advance Research Methodology" from May 19, 2012 - June 20, 2012 at National Academy for Education Management (NAEM), Ministry of Education, Government of Bangladesh.

Contribute to SAARC AgriNews

SAARC AgriNews is a widely circulated Newsletter devoted for disseminating agricultural research and development findings as well as information on applied technology for the farmers of South Asian region.

SAARC Agriculture Centre has been publishing this Newsletter (formerly SAIC Newsletter) since 1991 and distributing it to about 7,000 readers in SAARC member countries. The Centre has been distributing SAARC AgriNews to the relevant agricultural institutions, scientists and extension service providers of SAARC member countries for better livelihood of the farmers free of cost. Please send your articles, success stories and news on applied research, extension activities, proceedings and/or recommendations of seminars, symposium, consultations and workshops in the field of agriculture with relevant photographs either by post or through e-mail. Please note that unaccepted articles are not returned to the authors.

Multiple Ovulation and Embryo Transfer (MOET) in Sirohi Goat

Over the years, vast methods of reproductive biotechnologies are available which have resulted in augmentation of reproductive efficiency in farm animals including goats. The future trends in small ruminant production are expected to be dominated by emerging bio techniques of reproduction. To bridge the gap between the demand and production (milk, meat and fiber), it is mandatory to optimize production of prolific breeds and to augment the reproduction rate of less prolific breeds like Sirohi. These technologies relate to more frequent kidding, increases in litter size in less prolific breeds, extending mating outside the normal breeding seasons, Artificial Insemination, Multiple Ovulation and Embryo Transfer [MOET], IVF-ET and associated techniques, early pregnancy determination, application of real time B-mode ultrasonography in animal reproduction and control of kidding aiming to augmentation of reproduction.

Sirohi goat having normal oestrpus cycle pattern and apparentlygood health was selected as a donor. The goat was maintained under semi intensive system of management and superovulated using Pluset (Pluset, laboratorios Calier, SA). Pluset® is a porcine pituitary extract (PPE), which contains both of the gonadotropins, follicle stimulating hormone (FSH) and luteinizing hormone (LH). The objective of superovulation is to induce multiple follicles to grow and ovulate so that their oocytes (eggs) can become fertilised and

Four kids produced from donor using multiple Ovalution & Embryo transfer

the resulting embryos can be collected from genetically valuable donor females and subsequently transferred to recipient females that will gestate the embryos to term. To super ovulate, donor goat received 300 IU of FSH+300 IU of LH (Pluset, Spain) in tapering dose schedule (60IU FSH+60IU LHx2, 50IU FSH+50IU LHx2, 40IU FSH+40IU LHx2) at 12 hours interval in the morning and evening for 3 consecutive days, initiated on day 10 of the oestrous cycle. To regulate oestrous cycle donor received a single dosc of luteolytic drug (cyclix) @2.0 ml I/M along with concluding dose of gonadotropin. Donor goat was observed for onset of oestrus with an aproned buck twice a day at 12 hrs. interval. Donor exhibited standing oestrus within 48.00 hours of treatment. The donor goat was mated by a superior Sirohi buck during the standing oestrus. The recipient goats exhibiting oestrus along with the donor were selected for embryo transfer at 84.00hrfollowing standing oestrus.

Superovulated Sirohi goat was subjected to laparotomy at 84.00 hours after mating to record ovulatory response and subsequent flushing of embryos. A total of 14 corporaluteawere observed on the both ovaries with a moderate number of small-medium size follicles on ovarian surface. The uterine horns and oviducts were flushed by retrograde method to collect the embryos. In total nine morphological normal, good quality embryos and one unfertilized egg were recovered from this donor of Sirohi goat. These embryos were subsequently transferred in four closely oestrus synchronized recipients (@ 2 embryos/recipient) at the tip of uterine horn ipsilateral to the corpus luteum bearing ovary.

Following transfer, pregnancy was initially confirmed at day 35-40 by real time ultrasonography. Out of the four embryo transfer recipients, two recipients delivered two kids (01 male & 01 female) and third recipient kidded with a twin (male and female). Thus a total of four kids (2 male & 2 female) were produced from a single Sirohi donor. This work was undertaken under a research project, which was financially supported by NAIP of ICAR, New Delhi.

***Source : Dr S.D. Kharche**, Senior Scientist and CCPI of the Project. Physiology, Reproduction and Shelter Management Division, Central Institute for Research on Goats, Makhdoom,* Farah-281122, Mathura (UP) India

Exchange Visit

A team of 13 members from Ministry of Agriculture & Cooperatives, Government of Nepal visited different agricultural organizations in Bangladesh organized by SAC.

Success Stories of Bangladesh Rice Research Institute (BRRI)

Varietal development

The major achievements of Bangladesh Rice Research Institute (BRRI) has been in developing high-yielding modern varieties (MVs) of Rice. BRRI has so far released Sixty MVs (56 inbred and 4 hybrid) as follows:

13 for Boro Rice; 8 for Aus Rice; 25 for Aman Rice; 10 for Boro and Aus Rice and 1 for Boro, Aus and Aman Rice

With appropriate management, and under favorable soil and environmental conditions, these MVs may yield 5-7 t/ha in the Boro, 3-4 t/ha in the Aus, and 4-5 t/ha in the transplant Aman seasons compared with no more than 2-3 t/ha of the traditional varieties. A few BRRI MVs are now widely grown in some other countries, such as, India, Nepal, Bhutan, Myanmar, Vietnam and West Africa. During the early years of research, BRRI followed IRRI in developing semi-dwarf photoperiod insensitive varieties. Over time, BRRI scientists deviated from the IRRI concept of dwarfism for high yield, and restructured the IR8 plant type to suit local agroecological and climatic conditions. Intermediate plant height having relatively longer growth cycles and mild photo-period sensitivity.

The MVs developed in the 1980s and 1990s, are suitable for varying ecosystems and have a wide range of disease and insect resistance, for example, BR17, BR18 and BR19 have been developed for the Boro areas (depressed basins) in the north-eastern region of Bangladesh, BR20 and BR21 for the high rainfall upland situation (direct-seeded Aus), BR22 and BR23 with photoperiod sensitivity for late transplanting in the Aman season after the recession of the flood water, BRRI dhan27 for the non-saline tidal areas, and BRRI dhan30, BRRI dhan 31 and BRRI dhan 32 for rainfed lowland areas.

BRRI cereal chemists regularly evaluate the physical and chemical properties of rice in terms of taste, cooking quality, milling outturn, aroma, protein and amylose contents, etc, helping plant breeders develop varieties with desirable grain quality.

Very recently, eight varieties, of which two are aromatic, have been developed. These are awaiting final evaluation by the National Seed Board (NSB) for release as new cultivars. About 8,000 germplasms, most of which are local, have been collected and preserved in the BRRI gene bank. BRRI is now moving ahead with a radical idea, that of developing a new rice plant type with 'cluster grains' panicles. The new plants are expected to bring about 20-25% yield improvement over the existing MVs.

Crop-Soil-Water Management

Water management engineers have developed technologies and cropping patterns that permit more efficient water use and increased crop production at the irrigated and rainfed environment.

The Major Achievements of Soil Science Division, BRRI are:

- Developed fertilizer recommendations for the different BRRI MVs.
- Identified S and Zn deficiency problems in wetland rice soils of Bangladesh and devolved technologies to manage these problems.
- Recommended site specific soil and plant test based fertilizer doses for high yield goals in rice-rice and rice wheat cropping systems.
- Developed integrated nutrient management practices combining chemical fertilizers and crop residues/animal dung/green manure for rice-rice and rice wheat cropping systems.
- Identified poultry manure as a potential source of organic matter and plant nutrients for wetland rice culture.
- Recommended minimum tillage instead of conventional puddling method of land preparation for wetland rice on the fine and medium fine textured soil.
- Identified chlorophyll meter (SPAD meter) and Leaf color chart (LCC) based N doses for convincingly higher grain yields with appreciably lower amounts of applied N than farmers N practices.
- Identified USG technology as a potential alternative of split application of urea for higher yield and efficient N use efficiency for tidal submergence prone area where it is often not possible to follow the recommended schedule of split application of urea and where the risk of losses of surface applied N exists.
- Developed participatory plant nutrient management concept for village level soil fertility mapping and field specific nutrient management packages with intimate participation of local farmers.
- Develop fertilizer management packages for hybrid rice on cropping pattern basis.

The major achievements of BRRI Plant Physiologist are:

- Many advance breeding lines have been screened to identify materials tolerant to different abiotic stresses like salinity, cold, high temperature, flash flood, etc.
- BRRI dhan40 and BRRI dhan41 show and reproductive phases with salinity levels of 8-10 dS/m.
- BR10 and BR23 have shown similar tolerance score at reduction division stage with the same salinity levels.
- Strongly photoperiod sensitive variety is more affected by flash flood submergence than weakly sensitive and insensitive variety.
- The biochemical aspects of submergence tolerance have been explored. Regrowth of a tolerant variety during post submergence period was found to be associated with the amount of residual carbohydrate content and higher stability of chlorophyll during submergence period. Submergence tolerance was also found to be related with higher PDC and ADH activity.
- Younger seedlings (30 day old) from October seeded bed produced very low yield while sixty day old seedlings produced more than 5 t grain yield but thirty and sixty day old seedlings from November seeded bed can produce more than 5 t grain yield.
- Seedbed covered by transparent polyethylene sheet after 4-6 hours of sunrise was found to increase seedling height with higher dry matter content in Boro season.
- All the BRRI varieties have the potentiality to produce roots at 7-14 DAT even when the mean minimum temperature is 120C. However, varieties differ in root growth.
- Grain yield of T.aman rice is affected by the amount and distribution of rainfall during lean period of October to November. Under such condition insensitive early maturing varieties can be harvested in early October, should be grown.
- Elongation of basal internodes with thinner culm made BRRI dhan32 vulnerable to lodging.

(Continued on page 8)

Regional Training on "Quality Control of Milk during Production,Processing and Marketing and Introduction to Novel Technologies for Dairy Product Diversification

SAARC Agriculture Centre (SAC) in collaboration with National Dairy Research Institute (NDRI) jointly organized a regional training on "Quality Control of Milk during Production, Processing and Marketing and Introduction to Novel Technologies for Dairy Product Diversification" held at NDRI, Karnal, Haryana, India during 9-18 April 2012. The 21 participants from both public and private sector of SAARC member states namely Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka were attended this training.

This training program came from the recently completed consultation meeting on dairy production, quality control and marketing system in SAARC countries. Every consumer nowadays is quality conscious and wants to get assured about various quality attributes of food items before purchasing. The quality of milk and milk products is mostly based on constituents like color, flavor, texture, taste and freedom from external as well as internal defects. Numerous techniques for evaluating these parameters are now available commercially.

Milk and milk products make a significant contribution to the supply of nutrients to human beings. Milk and dairy products have been considered products with high nutritional value because of its high quality proteins and large varieties of bio-available nutrients. Dairy products therefore offer an excellent matrix for functional foods. The diversity of dairy products has introduced many dimensions to the food industry. There have been major advances in processing, preservation and quality assurance technologies to save energy and time while delivering wholesome, safe and shelf stable dairy products to the consumers. In this training we like to provide information and on hand training on latest technology and development in dairy processing, diversification and quality assurance. Mechanization for producing traditional dairy products, alternative process technologies, utilization of by-products to produce value added composite dairy foods.

Traditional dairy products is an integral part of our heritage, have great social, religious, cultural, medicinal and economic importance. In addition to preservation of milk solids for a longer time at room temperature, manufacture of traditional dairy products add value to milk and also provide tremendous employment opportunity. Owing to the inherent qualitative and quantitative differences, most of the products, particularly ghee, khoa, paneer and dahi have higher yield and better quality when they are made from buffalo. On the other hand, some of these products such as channa and rasogolla are of superior quality when they are made from cow milk. Most of these dairy products and new diversified products like lassi, gulabjamun are well characterized and the method of manufacture has been standardized using mechanized or semi-mechanized systems.

Objectives:

1) To learn about quality assurance of milk and milk products from farm to consumer level

2) To introduce with technology of different diversification of dairy products

It would strengthen regional cooperation and make mutual benefit with each other.

Bangladesh Rice Research Institute

(from page 7)

- The morphophysiological reasons for higher grain yield of BRRI dhan29 than BR3 and of BRRI dhan28 than BR1 are probably due to a) better top 3 LAI during ripening phase, b) higher crop growth rate and panicle growth rate and c) higher nu filled grain per panicle and filled grain per m2.

- IR64580-8-1-2B-9-1-2-1 and IR66043-2B-R-3-2-3-3 were selected for ratooning ability.

Pest management

BRRI entomologists have identified 175 species of rice insect pests of which 20 are major, 99 species of parasites and 108 species of predators.

(Continued on page 9)

(from page 8)

Bangladesh Rice Research Institute

Stem borers, hispa beetles, brown plant hoppers and rats have been identified as the most damaging insect and vertebrate pests of rice. Entomologists recommended measures for 20 major insect attacks. The magnitude of yield loss due to pest infestation in farmers' fields has been assessed. Sampling methods for determining the economic threshold levels of some of the major pests have been developed. Entomologists have helped plant breeders in developing twelve MVs with resistance/tolerance to five major insects, such as, brown plant hopper, rice stem borers, rice hispa, white-backed plant hopper, and green leafhopper. Ten technologies based on the integrated pest management (IPM) approach have been developed to control rice insects. Forty insecticides that are effective against different insects have been identified. Simple techniques for controlling rats by trapping have been devised. BRRI pest management group developed management packages consisting of cultural, mechanical, physical, biological and chemical measures (IPM) against major insect and diseases. To control the yellow stem borer, the sleeve trap (pheromone) is a very effective IPM tool.

BRRI Plant Pathologists

- Identified 31 rice diseases caused by viruses, mycoplasma, bacteria, fungi and nematodes.
- Listed ten diseases of major economic importance.
- Developed screening methods for major diseases.
- Identified more than 9000 sources of resistance against Bacterial blight, Blast, Tungro and Ufra diseases.
- Standardized quite a good number of chemicals and cultural control measures for major diseases.
- Developed integrated pest management packages combining chemical, cultural, mechanical practices and varietal resistance.
- Developed and adopted by farmers, technologies for improvement of farmers' saved seed.
- Assessed effectiveness of bio-control agents for disease management

Rice farming systems

BRRI rice farming systems scientists have been conducting on-farm cropping systems research since 1984 to develop improved systems to increase farmers' incomes. They have conducted site-specific research in different agroecological environments in partnership with farmers, agricultural extension department and NGOs for developing technologies. They developed (a) rice-fish farming system for the deepwater areas, (b) appropriate timing of crop establishment and suitable varieties and management practices for the rice-wheat cropping system, and (c) cropping system for incorporating short-duration pulses and oilseeds in between two MV rice crops for diversified farming and balanced human and livestock nutrition. BRRI Farming Systems scientists developed 31 improved cropping patterns for 30 agro ecological zones of Bangladesh.

(Continued on page 12)

IC-590813: A primitive line of King Chilli (*Capsicum chinense* Jacq.)

King chilli or Habanero chile (Capsicum chinense Jacq.) is a species of chilli that is native to Amazon basin. The Dutch botanist, Nikolaus Joseph von Jacquin, erroneously named the species as chinense in 1776 as he believed that the species originated in China. The species varies greatly in appearance and characteristics of plant growth, flowering, fruit morphology, taste and pungency, which makes very difficult to identify. IC-590813 (MZNC-1 collected from Mizoram, India) is a shade loving, unique primitive line having compact shrubby perennial plant type, approximately 80-110 cm in height, 70-90 cm in spread (frame size) with glossy-green lustrous leaves. The greenish-white flowers bears in cluster of 1-4 with upright long slender pedicel (stalk) and while the flowers bend to 45-90°. The flowers are complete, actinomorphic and pentamerous. The green sepals (calyx) are five lobed, united, persistent, devoid of calyx teeth, and clear constriction between the base of calyx and pedicel. This constriction is a peculiar trait of Capsicum chinense which differentiates it from other species of Capsicum. The greenish-white (dull) petals are five lobed and united. Stamens are 5 in number, epipetalous and alternate with petals. The fruits are upright on long slender stalk, small, almost round, pungent, buttery in taste and turn red on maturity. The line is showing profuse flowering (50-60 days after transplanting) and fruiting. The fruit weight ranges from 0.225-0.345 g (average 0.275 g) and size varied from 0.71-0.94 in diameter (mean 0.85 cm). Each plant bears 1200-1850 fruits yielding > 400 g of fruits per plant under net-house conditions in 8 month cropping season. Each fruit contains approximately 13-15 seeds. The seeds are smooth, tan in colour and 1000 seeds weight is approximately 1.75 g. Like traditional King Chilli (locally known as Naga chilli), a cultivar of Capsicum chinense, the line IC-590813 is partial shade-loving in nature and seed viability is very poor. The line has potential breeding value for number of fruits per plant (almost 5-10 times higher than normal chilli) which could be used as a genetic resource in future breeding programmes to improve the agronomic traits, productivity and quality of common chilli (Capsicum annuum L.).

Source: B K Singh and K A Pathak, ICAR-RC-NEH Region Mizoram Centre, Mizoram, India
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Annual Audit for the financial year 2011 of SAC

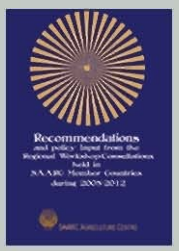
Annual Audit for the financial year 2011 of the SAARC Agriculture Centre (SAC) was conducted by a joint audit team (JAT) during 26-27 June 2012. The JAT 2011 audited the annual accounts and related statement of receipt and payment of the Centre from January- December 2011.

The JAT 2011 found that necessary account and financial reports were maintained by the Centre. The Joint Audit Team (JAT11) comprised of Mr. Muuthasim Ahmed Saeed, Manager, Financial Audit, Auditor General's Office, Male', Maldives and Mr. CA. Bhava Nath Dahal, Director, Office of the Auditor General of Nepal.

New Publication

Pesticide Information of SAARC Countries

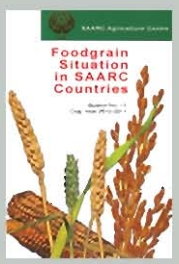
The book has countriy papers from Bangladesh, Bhutan, India , Nepal, Pakistan and Sri Lanka contain pesticides in use, mode of action, their chemical nature, pattern and trends of pesticide use, application details and restrictions, pesticide evaluation for their efficacy, records of health and environmental incidents, pest outbreaks, pest-resistance etc.



Recommendations and Policy Input of the Regional Workshops/Consualtations

Compilations of Recommendations and policy input from 20 (twenty) Regional workshops/Consultations organized by SAARC Agriculture Centre (SAC) in collaboration with different organizations of SAARC member countries during 2008-June 2012

SAARC Journal of Agriculture (SJA):
Vol.10, Issue:1, 2012
The SJA contains scientific papers of original research and review articles in the field of agriculture and allied disciplines from the member countries.Vol. 10, issue 1 contains 13 research articles in the same fields.



Food Grain Situation in SAARC Countries:
Bulletin. 15, Crop Year 2010-2011

The ' Bulletin of Food Grain Situation in SAARC Countries' provides information on major food grains in the SAARC member countries, including production, anticipated demand, likely shortfalls, surplus, etc. The information will be useful for planning strategies for achieving food security nationally and regionally

Progress of SAARC- Australia Project

The Second Training Workshop for Scenario Analysis with APSIM-ORYZA was held during 28-31 May, 2012 in Kandy, Sri Lanka. Prior to the Second Training Workshop a pre-workshop was organized in Kandy, Sri Lanka during 26-27 May, 2012 with the objective of reviewing the extent to which trainees had incorporated the additional data into APSIM.

The midterm review took place on the 1st June, 2012 at Kandy just after the completion of the training workshop. The project team and trainees, ACIAR reviewers, Mr. Tareque Muhammad, Director (ARD), SAARC Secretariat, Dr. Abul Kalam Azad, Director, SAC, Members of the Project Advisory Committee and Members of the SAC Governing Board from SAARC member countries, and other Sri Lankan stakeholders from the Ministry of Agriculture and the University of Peradeniya participated the review meeting. Feedback from key stakeholders was very appreciative of the project's results to date and also in favour of the project being extended in order to consolidate the capacity building outcomes achieved to date. The reviewers provided very constructive feedback and indicated that they were supportive of some form of extension of the project, but that its current modality needed to be reconsidered.

The Review Executive Summary and Recommendations are as follows:

This project aims to establish a network of scientists from Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka to collaborate on rice-based farming systems based on Australian expertise in systems analysis using the APSIM model framework. It is applying the coupled APSIM-ORYZA model to identify improved crop and water management practices to increase water productivity, and strengthen institutional support for systems analysis in the region.

The training activities conducted by the project have been of a very high standard and up to 19 scientists will be able to parameterize the model with soil, crop and weather data obtained on research stations. At completion of the project most of the trainees should be able to operate the model with little or no external assistance. A rigorous selection procedure for suitable trainees was used by the project but it resulted in a less than ideal cohort:

Recommendation 1: Any future selection of trainees should include more female participants, and younger staff, staff that have commitment to modelling and have time available for hands-on modelling work between training workshops.

The training has now advanced to the stage that the participants need to apply their modelling expertise to suitable priority agricultural constraints.

Recommendation 2: The trainees need to be provided guidance for meaningful and useful applications of the model, and be given specific tasks related to water management to do

in between training workshops. For training purposes this should be achieved during the proposed new timeframe of the project (to February 2013).

Training on the acquisition of location-specific farming practices and farmer-defined crop and water management scenarios for APSIM modelling by surveying farmers was not attempted as more effort was directed to filling gaps in data. Available data were from research stations rather than farms.

Recommendation 3: The project should abandon this activity (farmers' field data) as it is not possible to have adequate interactions with farmers in the foreseeable future.

Recommendation 4: Yield-gap analysis should be given priority from now on, and can be the basis for applications of the model by the more advanced participants from India, Bangladesh and Pakistan. Local statistics for farm crop yield can also be considered instead of on-farm data being measured by the project.

Even though farmers' preferences cannot be incorporated into the model as originally envisaged the identification of promising new practices for crop and water productivity can be made, though not tested on-farm. The project has plans to conduct workshops to expose NARS research managers and policy makers to the scope and value of systems modelling in order to foster greater institutional support. It seems that the project does not have any outputs suitable for the attention of policy makers. Therefore:

Recommendation 5: Project team should carefully review if there are worthwhile outputs that can be targeted to policy makers. A credible message or product needs to be prepared before presentation to farmer-researcher forums, or to NARS leaders and other stakeholders. The messages could be based on the prospects of models to reduce the time between research and its adoption and the reliance on models for projections in the future. The involvement of the original project leaders is important if this is to be effective.

The project tracked progress by the trainees over time.

Recommendation 6: A summary of the progress by the trainees based on the feedback questionnaires from the series of workshops should be included in the final reporting of the project.

Experience with previous APSIM (and other model) training projects is that the majority of trainees discontinue use of the model after completion of the training project. It is essential for a staff position to be maintained at SAC on a long term basis if they wish to maintain capacity in crop modelling. Additional "master trainers", as envisaged in the project's design, are required to reduce dependency on one person and on one agency. In addition, the trainees need to identify specific agricultural constraints that are amenable to research using models - a case of "use it or lose it". Some participants have already identified applications and intend to use APSIM in other projects, and this represents the main impact pathway for this project. The following recommendations were made to enhance the sustained use and application of systems models in the region:

Recommendation 7: As a matter of urgency the project should help with influencing SAC to maintain long-term capacity for modelling by establishing an on-going staff position for this purpose.

Recommendation 8: The project should be extended to 28 February 2013 using funds not expended due to the delayed start. During this period the project needs to identify 4 individuals who have demonstrated their commitment to modelling to serve as master trainers in Bangladesh, India and Pakistan and to start their advanced training.

The funding agencies should also consider additional funding for a period of 3 to 6 months to fully address the recommendations made by this review, particularly to complete the training of the master trainers in Bangladesh, India and Pakistan based on yield gap analyses as significant applications of the model.

In subsequent discussions with ACIAR, an unfunded extension of the project was requested until the 31 March 2013 for completion of revised milestones. At the same time, further discussions are going on with ACIAR and AusAID about a follow-on project (as distinct from the extension).

Institutionalizing modelling support within SAC

Broadening the current mandate of SAC to include a SAARC-wide support role in farming systems analysis and modelling is seen to constitute a significant capacity building outcome of this project. This should significantly boost the relevance and effectiveness of SAC in SAARC Member States, in turn strengthening SAARC's ability to foster regional cooperation. In order to build this capacity within SAC, the project is funding a project coordinator based within SAC, who is being trained to become the nodal point of contact for ongoing technical backstopping in modelling and future training of other scientists from SAARC Member States. In addition this resource person will also establish, maintain and expand the database.

For this to be effective, the SAARC Secretariat needs to continue supporting this position beyond the life of the project, thereby broadening the scope of SAC activities and strengthening its institutional relevance within SAARC.

Md. Jewel Rana Left the Centre

Md. Jewel Rana left SAARC Agriculture Centre (SAC) on 31 May 2012. He joined as Office Assistant on 13 January 2011. He obtained his MSS (Sociology) in 2006 from National University and MBA in Human Resource Management from Darul Islam University, Dhaka in 2010.

Regd. No. Dhaka 1334

SAARC Secretary General Visited SAC

SAARC Secretary General His Excellency Mr. Ahmed Saleem visited at SAARC Agriculture Centre (SAC), Dhaka on 20 June 2012.

During visit at SAC, Dr. Abul Kalam Azad, Director of SAC briefed the Centre's activities, achievements, success, challenges, its strength, weakness and future long term programmes/projects. H.E. Secretary General expressed his satisfaction on the SAC activities and its success. He said that SAARC success depend on its 11 Centre's activities and achievement. Peoples of the region pay a huge number of money for these Centre's. He urged to set up an example with dedication of works. Mr. Tareque Muhmmad, Director, SAARC Secretariat also spoke on the occasion. He said to run works on basic need and demand of the peoples of the South Asia and as per mandate of the centre and needs to increase the visibility of the Centre.

Dr. Wais Kabir, ex-Director of SAC and Executive Chairman of Bangladesh Agricultural Research Council (BARC), Dr. Md. Abdur Razzaque, ex-Director, SAC and Project Director of National Agricultural Technology Project (NATP), Mr. Razib Tripura, Assistant Secretary of Ministry of Foreign Affairs and technical staff from SAC and its officials were also present at the occasion.

Dr. S. K. Pal left SAC

Dr. Sandip Kumar Pal left SAC after completion of his tenure of services at the Centre and go back to his parent organization in India on 7 June 2012. He joined SAC as Deputy Director (Agriculture) on 9 June 2012. Prior to his appointment in the Centre, he was a University Professor cum Chief Scientist, Department of Agronomy, Birsa Agriculture University, Ranchi-834006, Jharkhand, India. He obtained his Ph.D from University of Seskachuan, Canada in the field of crop science.

Bangladesh Rice Research Institute

(from page 9)

Socioeconomics and Policy

Agricultural economists have conducted various studies to identify biophysical constraints to MV cultivation and assessed the impact of the MV rice technologies on rice production and productivity, its contribution to the national economy and, on farmers' incomes and alleviation of poverty. BRRI statisticians developed optimum plot size and sampling plan for field experiments with rice. They also developed, in collaboration with plant pathologists, the sampling techniques for disease assessment in rice fields.

Farm Mechanization

BRRI agricultural engineers have developed 20 agricultural machinery/prototypes:

1. BRRI Diaphragm Pump
2. BRRI Hydrotiller
3. BRRI Drum Seeder
4. BRRI Upland Seeder
5. BRRI Manual Transplanter,
6. BRRI Weeder
7. BRRI Kishan Weeder
8. BRRI Rice Wheat Reaper
9. BRRI Open-Drum Thresher
10. BRRI Rice-Wheat Thresher
11. BRRI Power Winnower
12. BRRI Srrl Drier
13. BRRI Propeller Pump
14. BRRI Rice-Hul Stove
15. BRRI Improved Chula
16. Fertilizer Applicator
17. Micro Rice-Mill
18. Power Tiller Mounted Rice Huller.
19. Micro Rice Flour Mill
20. BRRI Ground Nut Sheller

Technology transfer

BRRI effectively uses several tools for the transfer of newly developed rice varieties and production technologies to the farmers, either directly or through agricultural extension personnel and NGO's. One such tool is the annual BRRI-Extension workshop in which BRRI scientists and personnel of the Department of Agricultural Extension (DAE) exchange information and ideas. BRRI scientists conduct adaptive research in farmers' fields in close collaboration with the farmers concerned, DAE and NGOs to test BRRI developed technologies are tested under a wide range of edaphic and climatic conditions.

Training is an important mechanism to transfer technologies to the end users, i.e the farmers.Training offered by BRRI plays a key role in the transfer of rice production technologies. BRRI has so far trained more than 10,000 extension officers that enhanced their capability to organize and execute short-term training programs at village level extension workers.

BRRI scientists occasionally participate in Radio and TV programs for the farmers. BRRI regularly publishes annual reports, workshop proceedings, Rice Journal and technical bulletins. BRRI scientists publish research articles in journals, workshop proceedings, and popular articles in newspapers.

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