ISSN 1607-8317

SAARC

SAARC AGRINEWS

Vol. 8, Issue 2 (April- June, 2014)

Promotion of Agricultural Research and Development in SAARC Member Countries

A Quarterly Newsletter of SAARC Agriculture Centre (SAC)

Editorial

Conservation agriculture encompasses three management objectives: eliminating or significantly reducing tillage to minimise soil disturbance; retaining crop residues on the soil surface; and encouraging economically viable crop rotations that best complement reduced tillage and crop residue retention. It is important to note that conservation agriculture is not a fixed management system, but rather a set of principles that have demonstrated value across a wide range of agro-ecological regions. The precise ways that conservation agriculture-based management strategies are implemented as well as the advantages derived from these management innovations are contingent on regional and site-specific cropping system characteristics. Benefits of conservation agriculture -based crop management often include as reduced production costs and labour and energy requirements; timely field operations and avoidance of terminal heat stress; improved soil quality and reduced erosion; enhanced rainfall infiltration and reduced evaporative losses; higher crop water productivity (kilogrammes of grain per cubic metre of water); more stable and higher crop yields under rainfed and lack of assured irrigation conditions; and many other environmental benefits. Conservation agriculture-based crop management can provide a buffering mechanism against many of the abiotic stresses that limit productivity in rainfed conditions, especially with respect to conserving and maximising the productive use of water. For poorer farmers, there must be short-term payoffs from investments in climate risk management since the cost of adaptation can erode the asset bases of vulnerable groups and increase insecurity. The strength of conservation agriculture is that in many circumstances it can be profitably adopted by farmers with no regret because it reduces production costs and can stabilise and enhance crops yields against current climate risks as well as building resilience to future climate changes and variability. This should significantly reduce production risks posed by climate factors and labour shortages, thereby enabling a higher level of investments in inputs and management intensity that, in turn, would lead to sustained increases in yields and more secure livelihoods for resource-limited farmers. There are other pathways to improve water availability and productivity among smallholders, e.g. capturing and storing excess flows, adjusting the cropping calendar, and making use of weather forecast and other environmental information. The value of these pathways as complementary or independent approaches for building resilience to climate risks will also be evaluated in the targeted dryland areas. To be certain that farming systems as a whole benefits from any new interventions, innovations like conservation agriculture-based crop management are most usefully viewed from an enterprise perspective. This perspective facilitates the identification of optimal allocation strategies for competing uses for resources (e.g. crop residues for livestock versus soil quality), thereby minimizing tradeoffs and building synergies across the entire farming system. Also, sound agronomic management is required for all factors of production and not simply those directly changed by conservation agriculture. Among farmers in Central Asia, researchers have identified several constraints to the adoption of conservation tillage among smallholders, including: (i) weed control; (ii) competing uses for crop residues and uncontrolled grazing of residues left in the field; (iii) lack of dedicated forage and fodder crops; and (iv) absence of machinery for crop establishment without tillage. Similar problems could be anticipated in the smallholder rainfed systems of South Asia Region.

Issue Highlights

Experts Consultation Meeting for Inception on Identification of Rice Varieties Tolerant to Abiotic Stresses in SAARC countries

A regional consultation meeting on "Identification of Rice Varieties Tolerant to Abiotic Stresses in SAARC countries" which is grown successfully in adverse climatic situation towards ensuring food security among the SAARC countries was held in Bangladesh during 10-11 June 2014. The event was jointly organized by the SAARC Agriculture Centre (SAC), Bangladesh Agricultural Research Council (BARC) and International Rice Research Institute (IRRI). Renowned agricultural scientists and policy makers from SAARC countries (Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka) participated in the event.

SAC undertook this demand driven program to identify high yielding rice varieties sown under abiotic stress conditions in different environments of SAARC countries and organized a consultative meeting to discuss as to how the network could be initiated to encourage and stimulate national partners in SAARC region to commit themselves to exchange and share rice varieties among themselves and to enhance and expedite the process of varietal releases to their farmers through multi-location uniform evaluation trials.

Goal

This study was undertaken to identify high yielding rice varieties sown under abiotic stress conditions in different environments of SAARC countries in order to stabilize rice production under abiotic stress environment.

Objectives

1. To evaluate the performance of abiotic stress tolerant rice varieties evolved in SAARC countries and by IRRI in terms of growth and yield through adaptive trial.
2. To evaluate the potential of rice varieties sown under abiotic stresses for the on-farm adoption.
3. To identify genotypes with suitable performance in variable environments of SAARC countries.

Benefits

With the introduction of genotypes with suitable performance, rice yield per unit area and income of rice growing farmers of abiotic stressed areas of SAARC countries will increase, which will ultimately improve the socio-economic conditions of the farmers of the region.

Consultation Meeting

In the meeting, Dr. Uma Shankar Singh, a renowned rice scientist and South Asia Regional Coordinator of Stress Tolerant Rice for Africa and South Asia project (STRASA) highlighted the newly developed stress tolerant rice varieties under STRASA project. Dr. U. S. Singh confirmed that a number of multiple-stress tolerant rice varieties are in the process of being released soon while he mentioned that the variety are in the pipeline which can overcome at least three stress conditions like salinity, zinc deficiency and iron toxicity. Also he pointed that another variety is being to developed which has salt proof nature as well as biotic stress tolerant capacity. Most of the scientists from different SAARC countries pointed that scientists should also be focused on developing more farmer-friendly rice variety.

In the consultations, it was discussed that drought, submergence, salinity, cold and heat are becoming an alarming threat to crop production due to climate change, and these are increasing year after year. In Bangladesh,

the entire coastal-belt is going to be barren lands in boro season due to increased salinity. In monsoon, submergence in low-lying areas is now a common phenomenon where farmers are not getting good harvests due to flash-floods. Inadequate rainfall in transplanting, growth, and fruiting stage of aman rice cultivation is hindering the farm households to get good yield. Cold havoc for a certain period in winter season is destroying the rice seedlings in seedbed. Also due to extreme temperature, the rice panicles are becoming sterile while now-a-days farmers are getting poor yield. Almost similar problems are faced by the other SAARC countries while it is understood that a number of most suitable stress tolerant rice varieties have been developed recently by the different SAARC countries. Most of these newly developed stress tolerant rice varieties can overcome such adverse situation. After discussions, a number of most suitable stress-tolerant rice varieties have been identified by the SAARC delegates. Those varieties can be tested among the SAARC countries in their locality.

Regarding salt tolerant rice variety, the delegates identified the rice variety as Binadhan-10 and BRRI dhan61 in dry season in Bangladesh; CR dhan406, 403, and 405 in India; KSK 287, 133, and 434 in Pakistan; and Bg 369, and AT 354 in Sri Lanka which can survive up to 10-12 dS/meter in salinity condition. In relation to submergence tolerant rice variety, the scientists identified the rice variety as BRRI dhan51, 52, Binadhan11, and 12 in Bangladesh; Swarna Sub1, and IR64 Sub1 in India; Samba Mahsuri Sub1 in Nepal; and Bg 96-741 in Sri Lanka are suitable in 15 days submergence condition. To overcome drought condition, the participants selected the variety as BRRI dhan56, 57, and BU dhan 1 in Bangladesh; Shahabagi, and Pyari in India; Sukha dhan-2, and 3 in Nepal as the drought tolerant rice variety which can overcome at least two weeks drought condition in aman

season. Regarding cold tolerant rice variety, the delegates identified the variety as No.11 (Japonica), Yusiey, and Khap in Bhutan; Chandan in India; Khumal 8 and 10 in Nepal; Fakhre-Malakand in Pakistan; BR18 in Bangladesh, which can survive coldness in winter season. Regarding heat tolerance, the delegates identified the rice variety only IR6 and KSK133 varieties are available in Pakistan while two heat tolerant rice varieties are in process to release in India as expressed by the Indian Delegate. No other SAARC countries have any heat tolerant rice variety yet, while Bangladesh observed the highest temperature this year since 1950.

No. of varieties to be shared by member countries

Country	Drought Tolerant	Salinity Tolerant	Cold Tolerant	Heat Tolerant	Submergence Tolerant
Bangladesh	3	4	2	-	3
Bhutan	-	-	2	-	-
India	2	4	2	2	2
Nepal	2	-	2	-	1
Pakistan	-	3	1	2	-
Sri Lanka	-	2	-	-	1

No. of locations for adaptive trials

Countries	Trials to be sown
Bangladesh	Drought, Salinity, Cold, Heat, Submergence Stresses
Bhutan	Drought Stress
India	Drought, Salinity, Cold, Heat, Submergence Stresses
Nepal	Drought, Cold, Heat, Submergence Stresses
Pakistan	Drought, Salinity, Cold, Heat, Submergence Stresses
Sri Lanka	Drought, Salinity, Cold, Heat, Submergence Stresses

Recommendations

Varieties tolerant to abiotic stresses to be shared by member countries

Professionals from member countries (Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka), IRRI and local participants from 11 Institutes identified five areas of abiotic stresses.

1) Drought stress, 2) Salinity stress, 3) Cold stress,
4) Heat stress, 5) Submergence stress.

Focal point experts from member countries committed to share the varieties for adaptive trials. Collaborative experiments in form of adaptive trial will be conducted in each participating country. On the basis of performance, varieties will be identified for different regions.

Transboundary Animal Diseases: A SAARC Perspective

Transboundary Animal Diseases (TADs) are of significant economic trade and/or food security importance for a considerable number of countries and pose significant challenges in their control. TADs can easily spread to other countries and reach epidemic proportions. Control/ management of TADs, including exclusion requires cooperation between several countries (OIE, 2004). Outbreak of TADs such as foot-and-mouth disease, classical swine fever, rinderpest, peste des petits ruminants (PPR), and Rift Valley fever results in devastating economic losses to the countries affected. A recent and definite example of a TAD which has emerged as a biosecurity threat is the Highly Pathogenic Avian Influenza (HPAI) caused by H5N1 subtype of avian influenza virus which has both the zoonotic potential posing a major human health challenge and the potential to cripple the economy of a country by wiping out its poultry industry thereby creating a food security problem.

Emergence of TADs

Globalization, climate changes, cultivated ecosystems, accelerated urbanization and ever changing consumer food habits are contributing to the emergence of TADs which are not only economically significant but also are of grave human health concern. Recently, the occurrence of TADs is on the increase throughout the world. The major reasons attributed included

- Intensification of meat production due to increase in demand in developing countries.
- Pastoral and agro pastoral movements in search for water and pasture.
- Lack of quarantine due to wars and civil unrest.
- Increased smuggling and inflows of food aid.
- Inadequate awareness of the threats of epidemic animal diseases.
- Inadequate veterinary services laboratory diagnostic capacity for exotic diseases.
- Fewer or under reporting of the diseases by the affected countries due to fear of trade ban which may result in huge economic loss.
- Lack of compensation scheme by the government
- Poor reporting by farmers

All these factors hasten the spread of TADs in and between counties due to increased movement of humans/ animals/ animal products across the international boundaries, close interaction between the animals and human beings and lack of coordination between countries.

Impact of TADs

The TADS may have a significant detrimental effect on national economies as they cause significantly high morbidity and mortality in susceptible animal populationsand are a constant threat to the livelihood of livestock farmers. In general, TADs have the potential to cause:

- Serious loss of animal protein and/or loss of draught animal power for cropping thereby threatening the country's food security.
- Major losses in production of livestock products such as meat; milk and other dairy products; wool and other fibers and skins and hides, reducing farm incomes.
- Non-upgradation of local livestock industries due to difficulty in utilizing the exotic high producing breeds which are highly susceptible to various TADs.
- Increased poverty levels particularly in poor communities that have a high incidence dependence on livestock farming for sustenance.
- Significantly high cost of livestock production through the necessity to apply costly disease control measures.
- Serious losses in national export income due to disruption or inhibition of trade in livestock and livestock products either within a country or internationally...
- Public health exigencies in case of TADs with zoonotic potential.
- Environmental consequences through die-offs in wildlife populations in some cases, and
- Pain and suffering for affected animals.

Management of TADs

The basic tenet of modern disease management is to create an environment which maintains the disease pressure at low levels and not attempting for elimination of all diseases. However, even at these low levels of incidence, most TADs can cause serious damages to the national economy and food security either due to their virulence or threat to human/animal health and trade relationships. Therefore, prevention and subsequent elimination is a key element for the management of TADs. The range of zoo-sanitary measures used to manage transboundary plant pests and animal diseases according to where the risk occurs: exclusion measures to address the risk before it arrives in the regulating country; safeguards imposed to reduce the risk of spread; and the control of and adaptation to an introduction or eradication of the disease in the affected country are given in Table 1.

Reduction in probability of entry of TADs

The probability of TADs being introduced into a country can be reduced by (a) Quarantine - effective border and import quarantine policies and programmes (b) Concerted and coordinated efforts among neighbouring countries. (c)Accurate estimation of risk and (d) Early warning systems. Early warning for TADs for which animal movements are a major factor in spread (such as Foot and Mouth Disease, contagious bovine pleuropneumonia etc.) depend on a good understanding of livestock movement patterns and on-ground intelligence of where disease is active, although there is scope to foresee risk by predicting movement as a result of climatic events and price differentials. Tools like geographic information systems (GIS) make it possible to combine and cross-analyze a large amount of visual and numerical data, such as satellite retrieved images of the earth surface, climatological information, disease and livestock population data, and to produce predictions of disease spread. An example of GIS used in this way is the Programme Against African Trypanosiamiasis (PAAT) Information System which is designed to identify the impact of tsetse and trypanosomiasis on agriculture, to find the areas where control is technically feasible, and to find where animal and human trypanosomiasis occur together. Similarly, remote sensed satellite data can be used to predict insect-borne transboundary animal diseases such as Rift Valley Fever.

Response to Introduction or Outbreak

The control of animal diseases may involve vaccination, movement control, chemoprophylaxis and therapy, slaughter of infected and possibly in-contact animals, disinfection, and vector control in the case of vector-borne diseases. Preventive vaccination can routinely be applied on a national scale, as was the case with FMD in the EU prior to 1991 and in Uruguay before FMD eradication, or to certain areas with an elevated risk of disease introduction, often termed "buffer zones." In India, there is an ongoing vaccination program for FMD with the aim to eradicate the disease. Inter-regional and international reporting systems serve to inform officials of the entry and spread of pests and diseases of concern. This is done internationally through the OIE.

Management of economic impacts of TADs

The socio-economic effects of TADs are mitigated through biologically based measures aimed at control, containment, or eradication. The economic impacts also might be contained through risk management which might include insurance schemes, increased agricultural production or improved infrastructure. Alternative sources of income and employment through rural development or financial aid will also help. Any combination of these measures might produce a more stable and/or higher income stream for a farmer than relying solely on biological disease control methods. The comprehensive rural insurance scheme in India through General Insurance Corporation (GIC), which includes livestock, illustrates the role of governments in the development and provision of livestock services.

Challenges in Management of TADs in SAARC region

The SAARC countries share not only the borders but also the culture and large number of people to people contact. As a result of this management of TADs is complex in SAARC region. The challenges faced and lessons learnt in managing HPAI in SAARC region could be of help to management of TADs in SAARC region.

1. **Policy** - The SAARC countries share porous border and the people share economical, religious and social relationships across the border since ages. The ban on cross border trade is difficult to be managed and sometimes counter-productive as it would reduce the opportunities for authorities to inspect animal and animal products.

2. **Coordination** – A clear understanding and coordination on developmental issues by the partnering agencies such as FAO, governments and donors would lead to a better emergency response while dealing with TADs.

3. **Surveillance** – Targeted surveillance with a reliable system to detect the source of the virus is needed for identification and control of the TAD outbreaks.

4. **Epidemiology** – It is important to regularly isolate and characterise the causative agent.

5. **Laboratory Capacity** – Improving the facilities of the diagnostic laboratories and establishing technical working relationships with national and international laboratory staff would aid unpreparedness in dealing with TADs.

6. **Biosecurity** – There is always a need to develop local solutions as they work better than imported ones.

7. **Socioeconomics** - It must be integrated into any disease control project for it to be effective; the response should be proportionate to the risk and the Compensation should reflect the economic value of the animals/ birds.

8. **Communication** – Creating awareness without taking into account the socioeconomic and cultural practices and realities would not bring about changes in the behaviour of the communities. A participatory approach coupled with early cross-sectoral collaboration at field level and establishment of better communication between various government ministries and departments involved with agriculture, livestock, health, commerce and rural development would help in effective communication between the stake holders and the government machinery.

International Initiatives for control of TADs

The Global Framework for Progressive Control of Transboundary Animal Diseases (GF-TADs) is a joint FAO/OIE initiative, which combines the strengths of both organizations to achieve agreed common objectives. This initiative is also supported by the World Health Organization (WHO). GF-TADs is a facilitating mechanism that will endeavour to empower regional alliances in the fight against TADs, to provide for capacity building and to assist in establishing programmes for the specific control of certain TADs based on regional priorities. The GF-TADs also is a facilitating mechanism to empower regional alliances and partnership by providing capacity building and assisting in establishing programmes for the specific control of certain TADs based on regional priorities. The GF-TADs Regional Steering Committee is organized to ensure Sub-Regional coordination of the clusters and monitors and determines, with the Secretariat, performance indicators for effective field, laboratory, epidemiological evaluation of disease events and control efforts. For the Asia and Pacific Region, the Regional Steering Committee was organized in 2005 and its Permanent Secretariat is hosted by OIE Regional Representation for Asia and the Pacific (OIE Asia- Pacific) based in Tokyo, Japan. Member countries of the Association of South East Asia Nations (ASEAN), the Secretariat for South Asian Association for Regional Cooperation (SAARC) and the Secretariat of Pacific Community (SPC) are those to the three major Sub-Regional areas in Asia and the Pacific. The SAARC Regional Support Unit (RSU) located within the FAO sub regional ECTAD office, Kathmandu, Nepal is helping to set up the SAARC Communication working Group (CWG) dedicated to handling highly pathogenic and emerging and re-emerging diseases (HPEDs) in the region. The sub regional ECTAD-SAARC has also established two regional epidemiology centres in Bangladesh and Bhutan. Three SAARC leading diagnostic laboratories has been established in India (FMD), Bangladesh (PPR) and Pakistan (HPAI). Various training programmes have been organized incordination with SAARC.

Conclusion

Upsurges in animal disease emergencies worldwide are linked to the increased mobility of people, goods and livestock, changes in farming systems and climate, and the weakening of many livestock health services. In both developed and developing countries, outbreaks have sometimes eluded the attention of central veterinary authorities for days or even months, allowing them to spread unchecked. The result has been unnecessary production losses, and growing difficulty in mounting effective control and disease eradication campaigns. These trends indicate that early warning is one of the weakest links in disease surveillance systems, at the national, regional and international levels. It has to be realized that these particular diseases cannot be controlled by unilateral effort, particularly in the SAARC region which shares not only the borders but also the culture and large number of people to people contact.

Source: G. Venkatesh and S. Nagarajan, High Security Animal Disease Laboratory, Indian Veterinary Research Institute, Anand Nagar, Bhopal , M.P. India

Land change in Sri Lanka as famous tea loses out to vegetables

Sri Lanka's farmers are switching from tea to the more profitable vegetables

In the highlands of Nuwara Eliya, tea country since 1840, swathes of the perennial crop are being uprooted. On steep slopes and tea terraces, farmers are increasingly growing potatoes, leeks, carrots and other temperate vegetables. Sri Lanka's per capita income of $2910 and lower middle income status have triggered a dietary transition. Vegetables are much sought, particularly by urban dwellers, and profits are high. However, the shift from tea and loss of permanent dense foliage in its largest water catchment is causing erosion.

The Mahaveli River is Sri Lanka's lifeline, contributing more than 40% of the country's hydropower from six dams and feeding its largest irrigation schemes. When electricity from dams falls, Sri Lanka compensates by burning more coal and diesel than usual. February is always dry in this island nation, but this year the Mahaveli's levels are perilously low. The vista from Nuwara Eliya shows wide fringes of bare red earth around the river tanks, which are experiencing siltation and sedimentation.


Landscape with Sri Lanka's famous Ceylon tea

"These tea estates were once natural forest, which is best for river flow," explains scientist DK Pushpakumara, who represents the World Agroforestry Centre (ICRAF) in Sri Lanka. "Tea with shade trees is next best. But this cultivation of vegetables threatens the heart of our water system." "Trees force water into the ground" explains Ravi Prabhu, who directs research for ICRAF. The proliferation of buildings is a concern too. "Water will just run off with little re-charging of aquifers," says ICRAF chief scientist Meine van Noordwijk, who also notes that rains are increasingly fickle.

Sri Lanka is, in fact, an extensively tree-clad country. Intact forest makes up 28.2% (1,759,840 ha) and tree-rich agroforestry systems a further 24.4%. Rubber and tea cover 300,000 ha; coconuts 396,000 ha; and home gardens 900,000 ha. Agroforestry is the major source of saw logs. Human capacity is extensive too, with the investment in education paying off. The University of Peradeniya's agriculture faculty boasts 45 PhD holders. Youth female literacy is 99% and population growth less than 1% a year. Compare this with African countries where yearly population growth can surpass 3% and densities in highlands 1000 people/ha.

The Regional Resource Centre for Asia and the Pacific notes that one-third of the land suffers considerable erosion. "Poorly managed tea lands as well as abandoned tea lands lose sediments 15 times more than in a homestead, and 20 to 22 times more than in the wet zone forests." See Sri Lanka: State of the Environment (PDF). Degradation also threatens Sri Lanka as a global biodiversity hotspot. Home to 189 out of the world's 377 plant families, its multi-strata home gardens are particularly rich repositories with up to 1000 trees per hectare of between 100 and 200 tree species, almost all of which are used in one way or another.

Such "high-density trees-outside-of-forests systems" sustain ecosystem services, and Dr Pushpakumara wants them strengthened. "In Sri Lanka we cannot think about environmental protection without keeping the agricultural landscape healthy. We need diversification and domestication of trees." Sri Lanka has over 230 fruit tree species, many underutilized. Jackfruit (Artocarpus heterophyllus) provides fodder for elephants and goats, dye for the robes of Buddhist monks, seeds for flour, and mesocarp flesh for curry and desert. "We call it the rice tree because of its place in food security," says the professor at the University of Peradeniya.

Source: The Island, Sri Lanka

A case study

Crop diversification in anaerobic rice field using gunny bag reinforced soil columns

Submerged rice field limits cultivation of dicot vegetable in it because of its anaerobic nature. Use of biodegradable jute fabrics reinforced soil column have opened up a new vistas of growing dicotyledonous crops within rice field avoiding anoxia and providing sufficient oxygen to these crops facilitating adequate drainage by gravitational and lateral flow through messy jute hessians. Experiments were conducted at CRIJAF (2011-12) to explore utilization potential of woven and nonwoven jute fabrics in agricultural field and diversify anaerobic rice fields using gunny bags/woven and non-woven jute fabrics based soil columns (30-45 cm height and 15 cm diameter). For proper aeration of roots, upper 10-12 cm of the soil column should preferably be above water level. Crop diversification in rice field increases the cropping intensity, generates additional return, creates more employment opportunities and reduces the irrigation requirement of long duration vegetables due to its long association (2-3 months) with it. Extensive adoption of jute fabrics in subaquatic rice field for crop diversification will thus increase the marketing opportunities of raw jute fibre in nontraditional areas and improve the livelihood security of resource poor raw jute farmers of South East Asia.

As a case study, the experimental result of CRIJAF was validated, in rice field (cv. Neelanjan) Bajemelia, Singur, Hoogly where in gunny bags were used for making soil reinforced jute columns (30 cm in height and 15 cm radius)in kharif season of 2103-14. The columns were made in early boot stage in rice field in skipped rows left for BPH control (Photo 1).

Photo1. Gunny bags set in skipped row rice field, to develop reinforced soil columns to establish rice- bottle gourd relay cropping at Bajemelia, Singur, Hoogly

These gunny bags were soaked in systemic pesticide (Rogor) and fungicide solutions (Blitox) to increase its longevity in waterlogged rice field. These hollow open end cylindrical meshy gunny bags were fixed vertically on fertilized puddled soil and were kept stretched round its periphery by inserting 4-5 tough dry jute sticks (45 cm length) and few strong bamboo pegs along its inner walls, which acted as pillars. The jute sticks and bamboo pegs were inserted 15 cm in puddle soil for the firmness of the column. After this, farm yard manure, and fertilized puddled soils were filled alternately in four layers of equal depth in the jute columns for healthy establishment of vegetable seedlings in this soil column. For better yield, neem cake was given @ 100 g/column. Gunny bag reinforced soil columns were tied with pillars using jute threads outwardly in circular fashion. The soil columns were left as such for fifteen days for drainage of excess water from soil column. After it, bottle gourd seeds (4-5) were sown on top of the column.

Seedling was sprayed repeatedly with fungicides (Carbendazim, Mancozeb, Blitox etc) and systemic insecticides at weekly interval to prevent seedling mortality. Two hundred ml 3 per cent N:P:K::10:26:26 and 2 % urea solutions were given alternately in each column at weekly interval for nourishment of vegetable crops. The cucurbit vegetable were allowed to grow vertically within 8-10 ft tall hollow columnar gabions made of matured dhaincha plants (2-3 cm basal dia. and 200-300 cm height) with its bases inserted slantly and rdaillay in puddled soil at 20 cm interval close to the periphery of the soil columns. The upper end of the gabions had more diameter (2-3 ft) than its bases (1 ft) given it the shapes of inverted umbrellas These radially inserted hollow columnar dhaincha plants were tied loosely encircling it with unwoven raw jute threads at 20 cm intervals, so that vegetables do not fall on growing rice and interfere with it. Fertiliser management was dose as per recommendations. During rice growth, water depth in the rice field (hydrograph) varied from 0-30 cm. After rice harvest, the bottle gourd vines were allowed to grow on scaffold (Photo 2.) French bean was grown below the scaffold.

Photo 2. Successful bottle gourd crop at Singur, Hoogly grown on gunny bag reinforced soil column in rice-bottle gourd relay system

In one hectare area around 1460 soil columns were made costing around Rs. 17500/ha @ Rs.12 /column (inclusive of jute bag, labour, FYM and neem cake cost). The row to row spacing between columns was 2m and within the row, the distances were 2 m only. For vegetable cultivation in rainy season (sacrificing rice crop) traditionally cost required to transform a rice field with mega ridges to avoid anoxia (1m base width X 50 cm height, at a spacing of 50 cm) is around Rs. 40,000/ha. In this diversification system, only an area of 114 m2/ha (1.147% of a hectare) is used. We got standard harvest of 12210 no. of bottle gourds/ha (118 q/ha, 900g to 1kg each piece approx.). The farmer got net return of Rs.125000/ha meeting his expenditure. The rice yield was 4.5 t/ha (coarse grain).

At CRIJAF, different vegetables (different cucurbits, brinjal, tomato and field beans) etc yield ranged from 15 to 50 tons/ha earning a gross return of Rs. 1.5 to 3.00 lakhs/ha without hampering rice yield 3-4 t/ha (cv. Banskati and Satabdi) in kharif season. In summer rice field (2012-13), these vegetables were also grown in jute reinforced soil columns without affecting rice yield (5.4 t/ha cv. Kshitish) in the relay mode. In this system dioscorea, amorphaphallus and colocasia yield ranged from 120-150 q/ha. When grown as relay in summer rice in jute reinforced soilcolumn, the ginger [up to 4.5 kg single ginger (38 cm diameter and 18 cm depth)/clump developed from 80-100 g seed material only in eight months] yieldwent up to 600 q/ha.

Source: A.K. Ghorai, D.K.Kundu, S. Satpathy, Central Research Institute for Jute and Allied Fibres (CRIJAF), Kolkata, WB, India and Ram Prasad Ghosh, ADA Jute, Writers Building, Deptt. Of Agriculture Govt. of WB, India.

Choanephora pod rot: An emerging fungal disease of vegetable cowpea in Kerala, India

Cowpea (*Vigna unguiculata* (L) Walp.) is a remunerative vegetable crop known for its high protein content widely cultivated in Kerala State, India throughout the year either as pure crop or intercrop. Several fungal diseases hamper the cultivation of the crop among which Fusarium wilt, collar rot and web blight, foliar leaf diseases are considered important. Some of these diseases cause total collapse of the plant, whereas, others cause significant loss of foliage leading to reduction in pod yield. Recently, the vegetable cowpea grown in Kerala State, India has been found to be seriously affected by a wet rot disease on pods. The disease has been identified as Choanephora pod rot caused by the fungus, Choanephora *cucurbit arum.* There are earlier reports of the disease from other parts of world especially from African countries and the yield loss due to this has been estimated to 7- 10%.

The symptoms appear as water soaked lesions on pods which subsequently develop into a wet rot affecting both the young and mature pods. Diseased pods bear profuse white mycelia growth of the fungus. Pin head like sporangia soon arise all around the pods. Initially, the heads are white to brown in colour but later change to black. At this stage, the pod resembles a pin cushion with numerous small, black headed pins stuck in it. Water soaking extends widely and the entire pod may rot in 24- 48 h .The fungus also affects other parts such as pedicles, flowers and cause similar rotting symptoms. It has been observed that insect damaged pods are more affected. The mechanical injury caused by the pod borer facilitates the penetration of the fungus leading to infection of the pods. The withered and detached flowers also show fungal infection. In severe cases leaves may also get affected.

The fungal pathogen is found to survive on dead plant material in the form of mycelia or spores (conidia). The spores are disseminated by wind and insects such as bees and beetles. The infestation of cowpea pod borer predisposes the pods to infection

Weather conditions during crop growth also influence disease development. Hot, humid, cloudy weather and rainfall favor disease development. This pod rot is more prevalent during the monsoon season.

Since Choanephora rot appears on the edible pods, use of biocontrol agents and ecofriendly methods are considered suitable for managing the disease. Spraying of compost tea prepared by fermenting the aqueous extract of composts has shown promise in suppressing the disease when sprayed at weekly intervals. The pathogen can also be suppressed by spraying fungicide such as mancozeb (0.2%), copper hydroxide (0.2%) and propiconazole (0.1%) after the pod set.

Source: Ms. Milsha George and
Dr. Girija, V.K. , Dept. of Plant Pathology, College of Agriculture, Kerala Agricultural University, Vellayani, Thiruvananthapuram, Kerala, India

Visit to International Sericultural Commission, Bangalore, India

On the invitation of Her Excellency, Secretary General, International Sericultural Commission (ISC), Bangalore and on authorization His Excellency, Secretary General, SAARC Secretariat, Kathmandu , Dr. Abul Kalam Azad, Director, SAC and Dr. Tayan Raj Gurung, Senior Program Specialist (NRM) visited ISC, Bangalore, India during 9th to 12th April 2014 to study the activities of ISC and discuss on potential collaborations.

Background of ISC

The International Sericultural Commission which started in 1948 as the Permanent Commission of International Sericultural Congresses, is an inter-governmental organization registered with United Nations to engage in the development of sericulture and silk industry in the world. When ISC was institutionalized France, India, Romania and Yugoslavia were the founding members of the commission. The aims of the ISC are to encourage and promote the development and improvement from the technical, scientific and economic points of view, of all the activities dealing with sericulture in general (including moriculture, egg production, sericulture and raw silk reeling).

Currently there are 13 member countries (Brazil, Egypt, France, Greece, India, Indonesia, Iran, Japan, Romania, Madagascar, Syria, Thailand, and Tunisia). There are 20 associate members of the commission.

Core activities of the commission are as follows:

- Research and development
- Training
- Scholarship
- Volunteer Expert Program
- Sharing of genetic resources
- Global partnership program
- Consultancy
- Global meeting
- Awards
- Publications

Submit research or review papers to SJA

SAARC Journal of Agriculture (SJA), a half yearly publication from the SAARC Agriculture Centre is envisaged to serve as platform exchange of latest knowledge on breakthrough topics that are of current concern for researchers, extensionists, policy makers and students. It aims to capture the first-hand knowledge on research achievements in the field of agriculture, fisheries, livestock, forestry and allied subjects from the SAARC member countries. You can publish your research or review papers in our esteemed journal without any page charges or other processing cost. For author's guide lines, please visit our website: www.saarcagri.net. You are requested to submit your manuscript in electronic form via e-mail: saarcjournal@yahoo.com or via post addressing to Editor, SAARC Journal of Agriculture (SJA), SAARC Agriculture Centre, BARC Complex, Farmgate, Dhaka-1215, Bangladesh.

Visit

Six trainees from Ministry of Agriculture and Forests, Bhutan visited SAC on 5 June 2014

Dr. Abid Mahmood, Director-General (Agriculture), AARI, Faisalabad, Pakistan and Dr. Dil Baugh Muhammad, Agronomist, CCRI, Multan and Dr. Khalid Abdullah, Cotton Commissioner, Ministry of Textile, Government of Pakistan visited SAC on 19 June 2014

Ms. Pema Choden, Ambassador, Royal Bhutan Embassy in Dhaka visited on 17 June 2014

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 6,500 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.

Expert consultation meeting for inception on Regional Adaptive Trials on Oilseeds in SAARC Countries

Besides cereals, oilseed is one of the valuable and desired crops in the SAARC region for achieving food and nutritional security. Considering the importance of oilseeds, SAC identified the urgent need of sharing the genetic resources amongst the SAARC member countries. As such, SAC in collaboration with the Department of Agriculture, Renewable Natural Resources – Research and Development Centre, Yusipang organized an expert consultative meeting for inception on "Regional adaptive trials on oilseeds in SAARC countries" during 28-29 May 2014 in Bhutan.

During meeting, it was decided to collect varieties/ promising lines of rapeseed/mustard, groundnut, soybeans, sesame and safflower from SAARC member countries for adaptive trials to be sown in member counties. The experts from member countries also designed detail modalities and took several decisions for effective implementation of the programme in the SAARC region. This study will be undertaken to identify high yielding oilseed crops varieties sown in different environments of SAARC Region.

Objectives of the oilseeds Adaptive Trial

- To identify high yielding, drought tolerant, disease and insect-pest resistant cultivars/germplasm of oilseed crops
- Promotion of oilseeds with complete package of practices within each country through adaptive trial
- Promising cultivars selected from the trials will be submitted to relevant national regulatory bodies of variety release by focal points of individual countries
- Sharing of successful technologies, knowledge and best practices among the region would help sustainable development of oilseeds.

Focal Point Experts from Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka participated in the meeting. Professionals from various agencies under the Ministry of Agriculture and Forest, Bhutan i.e. National Seed Centre (NSC), Agriculture Machineries (AMC), Council for RNR Research of Bhutan (CORRB), RNR-Research and Development Centres, Bajo, Yusipang and Wengkhar also participated in the meeting.

Director General, Council for RNR Research of Bhutan (CoRRB) was the chief guest at the inaugural ceremony. The technical sessions were chaired by Mr. Ganesh Bahadur Chettri, Agricultural Specialist, Department of Agriculture, MoAF and Dr. Tayan Raj Gurung, Senior Programme Specialist (NRM), SAC. During technical sessions I & II, country status on oilseed crops were presented by Focal Point Experts. Each technical session was followed by discussion. In Session III on the second day, group discussion was made. Focal point experts from member countries committed to share the varieties for adaptive trials. Collaborative experiments in form of adaptive trial will be conducted in each participating country. On the basis of performance, varieties will be identified for different regions.

Recommendations

It is recommended that Adaptive trial on common oilseed crops in SAARC member countries may be planned to identify the most suitable and wider adaptive lines/varieties for different countries.

- Meeting agreed that SAC would coordinate adaptive trials on Rapeseed-Mustard (16 varieties), Groundnut (11 varieties), Soybean (11 varieties), Sesame (12 varieties), and Safflower (9 varieties). Participating countries will include one local variety as check.
- SAC should develop a mechanism to facilitate exchange of germplasm within SAARC member countries and other International Institutions through common collaborative research program and MoU among the SAARC member countries.
- Bilateral exchange of scientific technical expertise and farmers, SAC can facilitate such exchange.
- Establish Regional Institute for Oilseeds Research and Development as the oilseed group of crops are not being dealt by any international institute/organization under CGIAR.

No. of varieties to be shared by member countries

Country	Rapeseed/Mustard	Groundnut	Sesame	Soybean	Safflower
Afghanistan	-	-	-	-	1
Bangladesh	3	2	3	1	1
Bhutan	1	-	-	1	-
India	5	4	5	6	4
Nepal	2	-	-	-	1
Pakistan	3	3	2	2	2
Sri Lanka	2	2	2	2	-

NARC-2011: High yielding & Ug99 resistant wheat variety for irrigated area

Challenge

- Rust (leaf, stem and yellow rust) is the main threat to wheat productivity in the country.
- In past the losses to wheat productivity were up to 15% due to rust epidemic.
- Challenge was to develop high yielding wheat varieties resistant to Stem rust including (Ug99), Leaf rust and Yellow Rust, to sustain productivity.

Interventions

- During 2006-07, wheat germplasm of diverse origins was acquired from CIMMYT.
- PARC evaluated this material through standard breeding procedures for five years.
- Utilizing its Summer Wheat Station facility at Kaghan, PARC geared-up the evaluation process including shuttle breeding.

Outcomes

- In 2011, PARC developed NARC-2011 wheat variety which is a high yielding and resistant to all three rusts with special reference to Ug99.
- It has produced 7.2 tons/ha in National Uniform Yield Trials under irrigated conditions.
- During 2008–10, in the national trials it has shown resistance against yellow rust and leaf rust (RRI of 7.4 – 9).
- CIMMYT data have also showed that it is resistant against (potential threat of) stem rust race Ug99.
- The variety has been released for cultivation in irrigated areas after approval of Punjab Seed Council.
- It suits irrigated areas, matures in 159 days and has amber seed color.
- The variety has good quality traits i.e. suitability for chapatti making and has 12.3% protein content.

Wheat Variety: NARC - 2011
(NR-356 for irrigated area)

Wheat variety: NARC-2011

Way Forward

- Up-scaling the seed multiplication through contractual production system for accessibility to farmers.
- Popularizing the variety through field demonstrations.

Contributors:

Dr. M. YaqubMujahid, Breeder
Dr. Zaheer Ahmad, Breeder
Mr. M. Anwar Khan, Breeder
Mr. Maqsood Qamar, Breeder
Dr. Imtiaz Hussain, Agronomist

Source: Pakistan Agricultural Research Council (PARC) Official website (www.parc.gov.pk)

Regional Orientation Meeting on SPINet

Regional Orientation Meeting on SPINet held in Agriculture Education Unit, University of Peradeniya, Sri Lanka during 23-27th June 2014. Professor Buddhi Marambe, Department of Crop Science, Faculty of Agriculture, University of Peradeniya, Sri Lanka as the local coordinator welcomed all the delegates from the SAARC Member States and the guests in the inaugural session. Participants from Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka attended the orientation meeting.

Dr. H.H.D. Fonseka, Director, Horticultural Crop Research and Development Institute, Department of Agriculture, Peradeniya explained in detail the process how SPINet was conceived and developed into web-based information systems. The meeting was inaugurated by Dr. Rohan. R.A. Wijekoon, Director General, Department of Agriculture, Peradeniya who emphasized the relevance of information network on pesticides considering their rampant use in agriculture. Prof. K. Samarasinghe, Dean, Faculty of Agriculture, University of Peradeniya also remarked on the collaboration between SAARC Agriculture Centre, Dhaka and University of Peradeniya in developing the web-based pesticide information network. He reiterated that this collaborative work will be a land mark for both institutions. On behalf of the SAARC Agriculture Centre, Dr. Tayan Raj Gurung, SPS (NRM) proposed vote of thanks to all the dignitaries from the Department of Agriculture and University of Peradeniya.

Technical sessions were facilitated by Mr. Indika Thilakasiri, Mr. Lasantha Uthpala Nissauke, and Ms. Pramudee Fonseka. The sessions were divided into:

- General introduction of the web-based database application: SPINet System and Structure
- Administering the backend of SPINet
- Administering the frontend of SPINet
- Database management

A planning session was also organized to draw the course of action to complete the data input as completing the category of variables, appointing Data Manager, correction of the Website , completing uploading country data , country Profiles, link to the National Newsletter on Pesticide/IPM/Plant protection, link to National "Pesticide Acts and Policies" status and prospects on pesticide residue monitoring and management in SAARC Region – Consultative program and organize training on pesticide residue analysis techniques management.

Annual Audit for the financial year 2013

Annual Audit for the financial year 2013 of the SAARC Agriculture Centre (SAC) was conducted by a Joint Audit Team (JAT) during 24-25 June 2014. The JAT 2013 audited the annual accounts and related statement of the receipt and payment of the Centre from January-December 2013.

The JAT 2013 found that necessary account and financial reports were maintained by the Centre. The Joint Audit Team (JAT11) comprised of Maldives and Nepal.

All queries relating to SAARC AgriNews be addressed to the Director

SAARC Agriculture Centre (SAC)

BARC Complex, Farmgate, Dhaka-1215
Bangladesh
Tel : 880-2-8115353, Fax : 880-2-9124596
E-mail : sac@saarcagri.org
Website : saarcagri.org