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National Winter Crops Research Workshop

The 26th National Winter Crops Research Workshop was held at Khumaltar on 21-23 February 2005.

About 150 scientists, technicians, extension workers, representatives from NARC, Department of Agriculture, HARP, CIMMYT, Agriculture Inputs Agencies and farmers participated the workshop.

The workshop was inaugurated by the Secretary of the Ministry of Agriculture and Cooperatives, Mr. GP Pandey at a special function chaired by the Acting Executive Director Mr. DS Pathik during which Dr. SL Maskey, Director of Crop and Horticulture Research, NARC; Mr. SB Panday Director of Planning and Coordination, NARC; Mr. SS Shrestha Director General of

Department of Agriculture; Dr. GO Ferrara, CIMMYT Regional Representative spoke on the winter crops issues.

In the workshop, coordinators from different winter crop research programs (Wheat, Grain Legumes, Oilseeds, Hill-crops and sugarcane) presented status reports in plenary session and about sixty other different technical papers on the related crop research and development were presented in three different parallel sessions grouped on Plant Breeding and Seed Production; Plant Pathology and Outreach; and Agronomy and Soil Science.

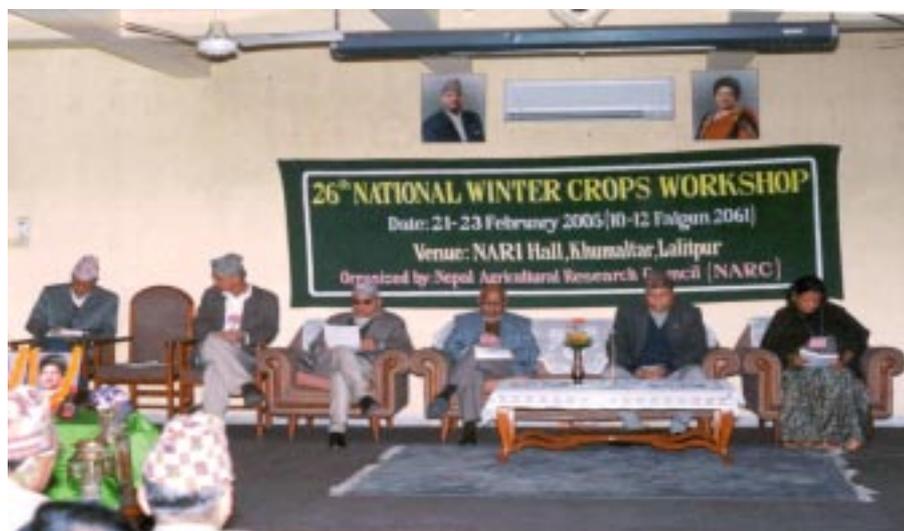
The workshop concluded with recommendations after discussion on group reports.

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Workshops on NARC Program Planning and Budgeting held

NARC annual program planning and budgeting for the FY 2005/06 has almost accomplished after a sequence of exercises at various levels within NARC planning process. However, before final approval by the Council, the programs and budget will have to be readjusted in line with the national budget allocation from Ministry of Finance.

The research program proposals were prepared, with feed-back from farmers/clients and in line with the national agricultural policy, guidelines and directives, at disciplinary divisions, research programs, regional and other research stations. The proposals were presented at regional planning workshop and technical panels meetings for review, screening and modification. The regional program and budget workshops were held separately at NARC, Kathmandu; RARSs Tarahara, Lumle and Nepalgunj during February-March. The technical panels meetings were held in the month of March/April at NARC, Kathmandu.



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Program on Seed Production

A special function was organized by District Seed Self Sufficiency Program (DISSPRO) coordinated by District Agriculture Development Office, Kathmandu on 16 March 2005.

The function was participated by about 200 farmers policy makers, researchers, extensionists and representatives from media.

Different farmer groups involved in the seed production program participated in the function and presented their achievements/activities on the seed production program. The farmer groups have been provided a cash amount of NRs 60,000 each for Seed Sufficiency Revolving Fund.

Two farmers' groups: Mahila Ekta Seed Production Farmers' Group, Mulpani and Shree Sundari Mai Seed Production Farmers' Group, Sundarijal produced 26 tonnes of rice seed of Khumal-4 and Khumal-11, the recently released varieties under the program in the current year. NARC had provided source seed to the farmers through the District Agriculture Development Office.

During the occasion, the winners in District level inter group competition on seed production were given away cash prizes by Kathmandu District Local Development Officer (LDO), Mr. Kedar Neupane. Those receiving the prizes were: Mahila Ekta Seed Production Farmers' Group, Mulpani; Shree Sundari Mai Seed Production Farmers' Group, Sundarijal; Fresh Vegetable Production Women's Group, Jorpati; and Rakshya Devbi Women Farmers' Group, Kabhresthali

At the Functions, Secretary of Ministry of Agriculture and Cooperatives, Mr. G P Pandey, Director General of Department of Agriculture, Mr. S S Shrestha; Kathmandu Local Development Officer, Mr. Kedar Neupane, Chief of Agronomy Division, Mr. GP Koirala, Agriculture Development Officers Dila Ram Bhandari and Laxman Khanal; and president and representatives of different farmers' groups, Mrs. Ishwori Khanal, Mrs. Nirmala Adhikari and Gokul Prasad Dhimal expressed their views on the importance of quality seed and the need to extend such programs to other parts.

Nepal-IRRI Initiatives

International Rice Research Institute (IRRI) located in Philippines opened its office in Nepal Agricultural Research Council (NARC), Kathmandu in January 2005 to strengthen coordination and establish good linkages with all the government and non-governmental organizations, who are committed for research and development on rice and rice-based cropping systems in Nepal. The office is also responsible for disseminating technologies on rice research and development developed by IRRI and other countries in the form of Rice Knowledge Bank (RKB).

There are two projects:

(a) Enhancing farmers' income and livelihoods through integrated crop and resource management in the rice-wheat system in South Asia.

In this project four member countries (Bangladesh, India, Nepal and Pakistan) are included. The objective of this project is to evaluate, refine, and promote integrated crop and resource management systems to attain food and nutritional security for the poor, to improve farmers' income through reduced costs of cultivation and efficient resource use, to promote crop diversification to reduce risk, add value, and improve marketing opportunities, to encourage the participation of private entrepreneurs in production and post-production management, to improve the quality of the environment in rice-wheat ecologies, and to build the capacity of rice-wheat stakeholders. This project sites (Rupandehi and Sarada Batase

of Kavre districts) representing terai and mid-hill have been identified and activities are being initiated by the team of scientists of National Wheat Research Programme, Bhairahawa and different Research Divisions of Khumaltar, NARC.

(b) Managing rice landscapes in marginal uplands for household food security and environmental sustainability.

There are four member countries (India, Lao, Nepal and Vietnam) in this project. The objectives of the project are: constraints, technology needs, and opportunities for technological interventions of upland farmers identified, and technology characteristics for farmers differentiated by gender, wealth, and ethnicity refined through participatory approaches; regenerative technologies for increased rice productivity in paddies validated using participatory approaches; suitable regenerative technologies for efficient, sustainable rice production systems in the sloping uplands validated using participatory approaches; options identified for institutional and policy improvement to facilitate rapid technology uptake; and capacity of local stakeholders enhanced. The activities of this project has been initiated in the command area of National Rice Research Programme (NRRP), Hardinath and Research Station of Doti under NARC as well as Lamjung Campus of Institute of Agriculture and Animal Sciences (IAAS), Tribhuvan University.

National Rice Day

In line with the decision of His Majesty's Government to observe the Ashar 15 as National Rice Day every year, Nepal Agricultural Research Council (NARC) is celebrating it with a special function at Khumaltar this year on 29 June. During this occasion, rice transplanting will be

initiated with special celebration participated by NARC officials, scientists, researchers and guests invited. An exhibition on different aspects of rice is also being held.

Rice is the most important crop ranked first in respect to production and consumption in Nepal.

First Report on Crown rot Disease of Wheat in Nepal

During 2001 wheat season, severe stunting, reduced ear, brown color stem bases and sterility symptoms close to frost damage was observed in wheat crop of Nepal 297 variety in some farmers field at Phutung of Kathmandu Valley. Series of field visits were made to identify the problem in the field and samples of roots, brown color stem bases and reduced ear were taken and studied for presence of any biotic agent. Aseptic isolation from root, stem and ear yielded the fungus *Fusarium graminearum*. The identity of the pathogen was confirmed by cultural, morphological and partly by molecular work (E. Duveiller CIMMYT/Nepal and R. Brayford, CABI Bioscience, UK. pers. com.). Pathogenicity test on seedling by root dip inoculation method resulted the symptoms close to field and recovery of the fungus fulfilling Koch's postulate. Some preliminary work to determine the identification of the disease of wheat caused by *F. graminearum* was done during 2005 wheat season. Again different wheat growing fields at Phutung were visited

within hollow center of infected part of lower stem at the base. Some infected tiller with pink coloration along the mass of white fungal growth around the basal stem clearly confirmed the disease as crown rot. The other hosts of *F. graminearum* are Durum, Barley, Triticale, Rye and Oat. The grasses susceptible to this fungus are Barley grass, Phalaris spp, Wild oat and other species. Crown rot causing *F. graminearum* is different that cause head Scab in wheat. Only on exceptional wet condition it shows head scab symptom. There are different forms of *F. graminearum* that causes diseases on cereals and maize is reported to be resistant to this form of organism. The pathogen persists on crop residue. The management is possible by crop rotation with pulses and burning infected stubble. Soil cultivation and decomposition also aids to reduce disease. As this disease is reported at certain parts of valleys, a careful planning should be designed to prevent this disease being spread to other parts.

Field Workshop on Yellow Rust Disease in Wheat

With the view to share experiences on the Yellow Rust disease in wheat that was wide spread in the last years, and to make out strategies against the disease for coming years, a field workshop was organized by Plant Pathology Division of Nepal Agricultural Research Council (NARC) on 18 March 2005.

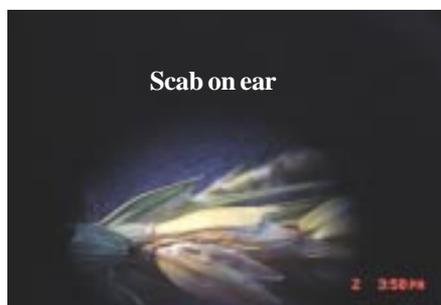
In the workshop, 40 farmers from different parts of Kathmandu valley, NARC scientists and directors, representatives from Department of Agriculture and NGOs had interactions on the issues related to the incidence of disease and control measures. The participants had field observation of Poly-house established for the study of disease at Plant Pathology Division and wheat trial plots at Khumaltar. The participants had also farmers' field visit at Ramkot, Kathmandu. During the occasions, Ms. Sarala Sharma, Senior Scientist, gave information about the disease and research activities conducted on it. As reported at the workshop by scientists, extensionists and farmers, there are several varieties that had been found resistant to yellow rust disease. It was shown in poly-house, research fields and farmers' field as well.

The yellow rust disease that passes through air has come as disaster to wheat crops in the last some years after about two decades in the country. Now the farmers seem to seek alternatives to wheat crops. The new resistant varieties of wheat has given hope to get rid of the disease and make the farmers continue wheat planting.

Wheat is one of the most important cereal crops ranked third in production and consumption in Nepal. It is grown in all the districts of the country.



and different wheat varieties were studied showing different other symptoms. The infected plant showed honey browning of stem bases and sub-crown internodes, death of single tiller, pinched grain and tip sterility. Some White heads symptom was also observed in other parts of the valleys. In the varieties Lerma rojo 64 and Lerma 52, so called local varieties, pink discoloration around crown was observed. Some plants showed pink fungal growth



● (By Sarala Sharma) ●

Workshop Recommendations

WHEAT

Genotypes identified for release:

- WK-1204 (for mid hills, yellow rust resistance, tolerance to sterility, good for bread)
- BL-2217 (for Terai, Tar and low Valley under timely and late sown irrigated condition, good for chapatti and bread, resistance to leaf rust, HLB and tolerance to sterility)
- WK 914 & WK 935, SW 89-5422, YANGMAI NO-6M, MILAN/SHAH7, ALTOR 84, (Resistant to Yellow rust and leaf rust)
- BL 2047(Against Foliar Blight)

Genotypes in pipeline:

- BL-2089, BL-2376, BL-2544, BL-2602, WK-1320, WK-1325, BL1862, BL7555, BL1923, BL1968, WK 1123, WK 1156 (For Hill)
- BL-2047, BL-2473, BL-2437, BL-2189, BL-2516, BL-2548, BL-2662, BL-2675, BL-2844, BL1923, BL1965, BL1968, BL1999, BL2195, BL2217, BL2067, BL2064 (For Terai)

Other technologies to be released:

- Zero tillage (for Lower & Mid wetland) Bhrikuti, BL1887 & Achyut (Timely planting), Bhrikuti & BL 1473 (Late Planting)
- Wheat planting under adverse climatic condition, i.e. Late rain in the month of Kartik (oct-nov) and rain during wheat planting that delays wheat planting.
- BP/ZT + OPUS @ 2M/ Litre for HLB
- Nutrients specifically N, P, & K supplied through 50% from chemical fertilizers and 50% from compost or FYM to improve the productivity of wheat and sustain the soil health
- Direct seeding of rice and followed by wheat in bed for N use efficiency in rice/wheat & soil physical health

POTATO

Varieties in pipeline:

- Clone 388580.6D (For hills), Clone 388572. 4K (For terai), Clone 388572.IK (For hills and terai)

Other technologies in pipeline

- TPS Families CFK 69.1 x TPS 67 and CFK 69.1 x TPS 13 (Hybrid True Potato seed for terai and Kathmandu valley)
- TPS be promoted in areas where seed tubers are difficult to transport like in Karnali zone

Grain Legumes

LENTIL

Varieties to be released:

- ILL-7723 for Western Terai (Medium bold seed, tolerance to wilt and blight)
- ILL-6829, ILL-7982 for Mid Hill and Valley (Tolerance to wilt and high yield)

Varieties in pipeline:

- ILL-6819, ILL-7164, ILL-6447, ILL 7162, ILL 7723, ILL 7986, ILL 3490 (for rice relay system in terai and mid-hills)
- ILL 7537R, ILL 6829 (for rice relay system in terai under post rice condition)
- *Trichoderma koriungii* for resistant variety

Other technologies in pipeline:

- Lentil seed treatment with Thiram + Benlate @ 3g/kg
- Under lowland condition, relay sowing of lentil two weeks before rice harvest

(in last week of October) is better than sole cropping after rice harvest.

- Seed priming overnight (12 hours) for yield increase over non priming in post harvest rice condition.
- On rice lentil cropping system, power tiller drill on unploughed fields for higher grain yield with lower establishment cost by 73% compared to farmer's practice.

CHICKPEA

Varieties to be released:

- ICCx840508-36 for Terai and Inner Terai (High yield, medium size seed, tolerance to wilt and BGM)
- Avrodhi for Terai and Inner Terai (High yield, medium size seed, tolerance to wilt and BGM)
- ICCx840511-25 for Weatern Terai (High yield, medium size seed, tolerance to wilt and BGM)

Varieties in pipeline:

- ICCL-87312, KWR-108, BG-1206

RAJMA

Technologies for release:

- Irrigation in Rajma twice at 20 & 40 DAS (Terai)

Technologies in pipeline:

- Variety PDR-14 (Udaya) in Chitwan & Pokhara

Hill-crops

BARLEY

Varieties to be released:

- LG-51 (for High Hill)

Varieties in pipeline:

- XVEOLA-45, NB1003-37/11081, B90K-014-0-3-1-1-OK

Oil Seeds

Varieties to be released:

TORI

- M-27 for Terai and Inner Terai (High yielding)
- PT-30 for Terai and Inner Terai (High yielding)

MUSTARD

- Bio-902, Rohini (for Terai and Inner Terai)

Other technologies for release:

- Seed treatment and foliar spray of mancozeb against alternaria blight in rape-seed mustard

Other technologies in pipeline:

- Application of 10 t/ha Compost along with 30:20:10 kg NPK/ha and B 1 kg/ha (Terai)

SUGARCANE

Varieties in pipeline:

- CoSe-98231, CoSe-96234, CoSe-97232 (Early variety)
- UP-9530, CoSe-96436 (Mid-late variety)

Other technologies in pipeline:

- Trash burning + stubble shaving + Mulching (after harvesting in February-March) to enhance ratoon crop yield (Terai)

Root Crop

Technologies in pipeline:

- Panje tarul and Ban Tarul

Vegetable Crop

Technologies in pipeline:

BRINJAL

- Parwanipur Selection 1 (For terai belt)

Herbal Plant

CHIRAITO

Technologies in pipeline:

- FYM application @ 10t/ha (5t at planting & 5t at weeding in 2nd year) for Chiraito production at PAC.

General Recommendations

- Molecular characterization of important crops
- Plant breeders meeting to develop crop wise breeding protocols
- Double haploid breeding in important crops
- Crop residue management by recycling crop residue
- Long/short term training to researchers based on the need of the research projects.
- Joint program of NARC, DOA, ADB and Suppliers for scaling up of generated technologies like RCTs
- Creation of Revolving fund so that farmers can adopt the technologies (RCTs) that requires resources.
- Subsidies/soft loan for farm machineries purchase and other inputs (RCT technologies)
- Active WORKING GROUP with DOA, DLS, DADO, DLSDO for scaling up of outstanding technologies
- Expansion of outreach sites to replicate the technologies and to work directly with grass-root level of CBOs rather than National NGOs.
- Use of Various Source of Media sufficiently to popularize the technologies and create awareness among clients
- Focus on IPNS to Enhance Soil Productivity and Maintain Good Soil Health. However, priority is to apply more of organic manures
- Provide suggestions to National Fertilizer Policy Division under MOAC on Importing Chemical fertilizers that are suitable to specific Crop and Soil Requirements (like importing Ammonium sulphate and SSP as well for oilseed crops, K_2SO_4 for quality production of potato, if possible CAN for acidic soils, Complete fertilizers for balanced use) according to NARC recommendation
- Establish joint program on climate prediction and agriculture among NARC, DOA, DHM and DOI.
- Collaboration with Agro-forestry for biomass production that will enhance organic farming eventually by interlinking Livestock and Agriculture
- Application of GIS/RS in planning process at the central level and identification of research domains and similar areas where the cost effective technologies could be spread. In addition, the huge information collected by NARC institutions should be interpreted so that it could be readily used for various purposes.
- Mechanism Developed for Timely Delivery of Inputs and the Production Program (Seeds or Grains) should be linked with Market Opportunities
- Development of joint or independent training slot based on need of researchers
- Review of the past recommendation and their implementation
- Surface seeding of wheat released for mid and lower wetland ecosystem be scaled up massively.
- Long term impact of RCTs should be studied/reviewed on pest, weeds, insects, diseases and soils
- Strengthen/revive the Regional soil & plant testing laboratories which were established long back, to provide services.

Workshop on Finger millet

The progress review workshop on the finger millet project "Enhancing the Contribution of Nutritious but Neglected Crops to Food Security and to Incomes of Rural Poor: Nepal Component" was held in Kathmandu on 28 January, 2005

The major objective of the workshop was to review the project progress and develop proposal of program activities for the year 2005 that also gave an opportunity to share and exchange experiences among project partners and stake holders. The workshop worked out to document the progress and information generated from the study conducted in different thematic areas at different project sites.

Under the project, different activities in for thematic areas, namely, Varietal Evaluation and Production Management; Socio-economic Study and Local Knowledge Documentation; Value Addition, Product Diversification and Market Promotion; and Linkage with Stakeholder and Public Awareness have been conducted and proposed for the next year.

The project was started three years ago in Nepal as a part of a global project in coordination with MS Swaminathan Research Foundation (MSSRF) with financial support of the International Fund for Agricultural Development (IFAD), Rome and International Plant Genetic Resources Institute (IPGRI), Rome. Nepal Agricultural Research Council (NARC) is national coordinating center for Nepal component that has the objectives to utilize the potentiality of fingermillet genetic resources through development oriented research, which contributes to raise the incomes and strengthen the food security of small farmers. Researches under the global project are conducted in Bolivia, Peru, Ecuador, Egypt, Yemen, India, Nepal etc. Researches on fingermillet as medicinal plant are also being conducted under the project.

Finger-millet is the important crop in the hills of Nepal. Most of the area under mid hills belongs to maize/millet relay production system. The crop is more important in subsistence farming system of inaccessible area where it is grown without external input in marginal land. Because of long duration storability this crop has paramount significance on the food security of poor people. Thus, finger millet has significant role to sustain hill agriculture system and is a staple food of poor people.

Fingermillet is very rich in iron, calcium, minerals and phosphorus as compared to other cereals. It is a good source of limiting amino acids like lysine and methionine and rich in vitamins like thiamine, riboflavin, and niacin. Thus, finger millet is a natural gift to poor for their nutritional security, as they cannot afford to buy expensive fruits and livestock products. But, it is still a neglected crop and considered as low status food. As per preliminary estimation for the Fiscal Year 2004/05, the total fingermillet cultivated area in Nepal is 2,58,839 ha and production 2,89,838 mt and productivity 1,120 kg/ha. The productivity in average seems to increase by 24 kg/ha over the last one year however it has been found to give an yield up to 4,355 kg/ha with new technology and practices. The popularity of finger-millet is also increasing as a result of promotional work under the project

Three different varieties of finger-millet (Okhle-1, Dallye-1 and Kabhre Kodo-1) have been officially released so far for farmers to cultivate.

NARC Scientist: Recent Ph.D. Holder



Mr. Shambhu Prasad Dhital, Senior Scientist of NARC, obtained Ph.D. degree in Plant Science from the Kangwon National University, Korea, in February, 2005.

His PhD thesis entitled "Establishment of Efficient Virus Elimination and Seed Production System of Potato (*Solanum tuberosum* L.) Under *In Vitro* and *In Vivo* Conditions". had the objectives to study the efficacy of virus elimination by cryotherapy, to evaluate the *in vitro* cultural conditions of inorganic nutrient and plant growth regulators for the production of

plantlets, microtubers and minituber production, and to evaluate the effect of chemical compounds and storage temperature regimes on breaking tuber dormancy of seed potato and subsequent yield performance.

In the case of virus elimination, the conventional meristem culture resulted in 13.9% PLRV-free and 11.4% PVY-free plantlets, while the cryotherapy by vitrification method resulted in 36.8% PLRV-free plantlets and 42.1% PVY-free plantlets. For *in vitro* microtuber production, suitable culture medium with inorganic nutrients and plant growth regulators under certain incubation condition was identified. This resulted in production of the highest number (avg. 1.9/plantlet) and yield (avg. 1346 mg/plantlet) with the largest size (avg. 712 mg/microtuber) of microtubers. In the case of minituber production under glasshouse/plastichouse conditions, combined application of BAP (10 mg/L) and B 9 (200 mg/L) produced the maximum number (avg. 7/plant) and yield (avg. 63.5 g/plant) of underground minitubers, and combined application of PCL (0.5 mg/L) and B 9 (200 mg/L) produced the highest number as well as yield of aerial tubers. Tuber treatment with bromoethane (0.2 ml/L) for 24 h, and combination of bromoethane and GA₃ induced early sprouting significantly. Thus, this whole package can be applied for the rapid multiplication of virus-free planting materials under *in vitro* or *in vivo* conditions for the efficient seed production of potato.

Dr. Dhital has been working in the field of potato research and development for the last 20 years.



Mr. Doj Raj Khanal, Senior Scientist (S-3) in NARC has completed Ph.D. and has been conferred Doctor of Science (D.V.Sc.) in Clinical Veterinary Science from The United Graduate School of Veterinary Sciences, Yamaguchi University, Japan in March 2003.

In his Ph.D. thesis, Dr. Khanal made study on "The Discovery and Novel Development of Phosphated Chitin (P-chitin) with an Anti-inflammatory Activity."

Chitin, the second most abundant biopolymer next to cellulose on the earth was converted into P-chitin, a water-soluble derivative that was screened for the anti-inflammatory activity against experimentally induced pneumonic models in mice and dogs. Upon *in vivo* screening of 24 formulations of P-chitin having different chemical characteristics such as molecular weight and degree of substitution, only seven were found effective when administered intravenously @ 8 mg per kilogram body weight in protecting mouse lungs from experimental pneumonia. Either low to moderately substituted, low molecular weight P-chitin samples or those with higher molecular weight and moderate to highly substituted samples were found effective. Pneumo-protective effect of P-chitin was more evident in a mouse model than in a dog model. P-chitin manifested pneumo-protective and anti-histaminic activities besides *ex vivo* inhibition of super oxide radicals as evident from chemiluminescence experiment in a mouse model.

Born in 1965 December, Dr. Khanal got M.Sc. (Bioprocess Technology) from the Asian Institute of Technology, Thailand in 1997 with his thesis entitled "Biomedical Application of Chitosan and its 5-methyl pyrrolidinone derivative as Osteogenic Agent." He has been working in Animal Health Research Division, NARC since 1994.

Workshop on Fodder Oats

A three-day workshop on "Fodder oats, Fodder technology packages and small farm Income Generation" under the FAO-TCP Project "Capacity Building for Fodder Oat Technologies in Nepal" and the Sixth Meeting of the Temperate Asia Pasture and Fodder Network Working Group was held in Kathmandu from 8-11 March 2005.

The workshop participated by TAPAFON Working Group members from Nepal, India and Bhutan and researchers and extension people had discussions on issues with focus on improving the lives of small farmers through the use of knowledge and technologies packages generated by the TCP project and the Fodder Oats Network. About thirty papers related to fodder research and development were presented that showed that there are good fodder oat technologies and cultivars available as well as small bag silage techniques that farmers have readily adopted.

During the workshop the National Coordinators and representative from Bhutan, Nepal and India met to discuss TAPAFON affairs that has much benefited grass-root farmers and fodder scientists and extension workers through the Himalaya over the last years.

The workshop was coordinated by Mr. Dinesh Pariyar, National Project Coordinator and Chief of Fodder and Pasture Research Division, NARC. FAO Country Representative Mr. Kazuyuki Tsurumi and Dr. Stephen G. Reynolds from FAO, Rome also attended the meeting.

Sisno in Poultry Feed Increased Egg Production

A team of researchers led at Agricultural Research Station, Pakhribas have uncovered the magic property of Nettle (*Urtica dioica*) commonly known as SISNO, a commonly found shrub of the mid hills, for boosting egg production even in weekly once feeding trial. In a pilot research at the station, a total of 16 dual purpose laying hens and 4 male cocks aged 24 weeks were divided into two groups, each group consisting of 8 layers and 2 cocks; housed in two separate pens. One group received 100 % normal feed (Control) (@ 120 gm/bird) while the other received 88 % normal feed and 12 % nettle (Sisno) preparation (Treatment) on each Monday of the week. In the remaining days of the week, both group received 100% feed. Eggs produced were collected daily and total eggs laid per week were counted for both group. Trends of egg production for a period of two and half months were compared and it was revealed that weekly once feeding of Sisno powder significantly (p<0.01) boosted 35% egg production up besides keeping the bird very healthy. This team has found no untoward effects of Sisno feeding in treatment group in the study period and wishes to conduct further investigation on immunomodulatory aspect on the coming year. On-going research in pig is also encouraging.

● Reported by Dr. D. R. Khanal

Notes on SRI work carried out in Rupandehi, Nepal

-MR Bhatta, J Tripathi, RB Neupane and S Justice

National Wheat Research Program, Bhairahawa conducted research in System of Rice Intensification (SRI) on the station and farmers' fields during 2001-2002

Experiment 1

An initial study in SRI using two rice varieties (Sabitri and Radha-4) were conducted at NWRP, Bhairahawa. Three spacings (20, 30 and 40 cm) and farmers' practice; four weeding practices (manual weeding, chemical weeding, hand rotary weeder, weedy check), and two seedling ages (10-days-old and farmers' practice, 20-day-old seedlings). A plot size of 500 sq m per treatment with two replications was set up for experiment. Only chemical fertilizers were applied. The station represents a lower wet land with heavy soil - silty loam structure, poor drainage, and low organic content.

The yield obtained from Sabitri was significantly higher compared with farmers' practice. Whereas, in Radha-4, yield obtained was lower compared with farmers' practice.

Excluding weeding cost, there is a 28 percent yield advantage with 20x20 cm spacing and 33 percent with 30x30 cm spacing over farmers' practice with manual weeding treatment. There is less weed population in farmers' practice. 40x40 cm spacing did not give sufficient yield compared to 20x20 cm and 30x30 cm spacing. Here, the yield and yield components were affected by spacing, weed control methods, and transplanting techniques. The reason simply is that there is no profuse tillering as expected in wider spacing. There is less oxygenation in the study plots after transplanting as there was continuous water stagnation due to rains. And land area was not fully covered by crop canopy in wider spacing.

Experiment 2

A study was carried out in five farmer's fields in Rupandehi district during 2002 rice season. The land and soil types were quite different from our station's soil. The plots were relatively well drained, and farmers occasionally use organic manures in their fields. Chemical fertilizers were applied at 100:50:30 kg N, P₂O₅ and K₂O per hectare. Plot size varied from 300 to 500 sq m. Manual weeding as well as hand rotary weeder was used by farmers.

One of the farmers could not control weeds on time and there were poor yields, so those data are not included here. Only grain yield data from four farmer's fields are shown in Table 2. On-farm SRI yields are better than those obtained in the station. A maximum number of 80 initial tillers and maximum number of effective tillers up to 60 were observed in some hills. Again 20x20 spacing out-yielded the rest of the treatments in Table 1. There is 49 percent higher grain yields compared to farmers' practice.

Maximum grain yield of 9.6 ton per hectare was obtained with 20x20 spacing. The national average rice yields are 2.7 ton per hectare. There is great potential of SRI to increase rice production in the country. The only problem is the management of weeds on time. Many more farmers have adopted SRI in Rupandehi district. This season's on-station SRI study includes 10-day single seedlings as well as two seedlings per hill to see the number of tillers per hill and final yield.

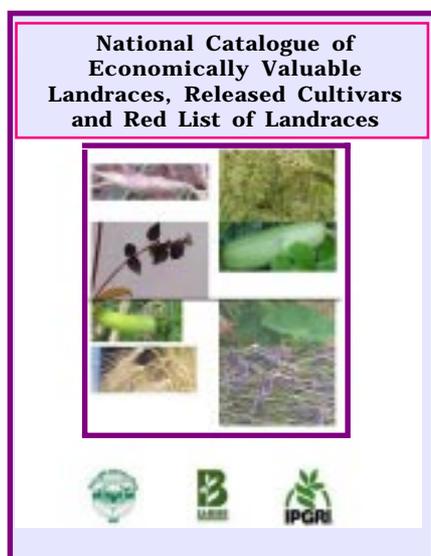
Table 1. SRI Yields Obtained from On-farm Sites of National Wheat Research Program, Rupandehi District, Village Tikuligarh, 2002 Rice Season

Spacing (cm.)	Rice grain yield (Kg/ha) Average of four farms					Yield increase over FP
	Farm 1	Farm 2	Farm 3	Farm 4	Mean (kg/ha)	
20 x 20	8.80	9.11	9.68	7.71	8.82	49%
30 x 30	8.86	6.32	6.85	8.42	7.63	28.8%
40 x 40	3.19	4.74	7.90	7.15	5.75	-2.9%
FP	6.76	5.26	5.26	6.40	5.92	

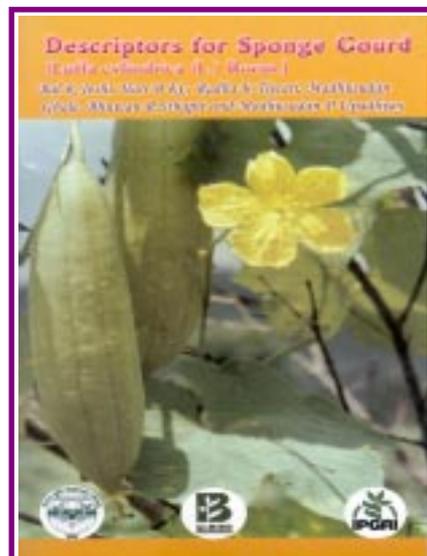
TRAINING WORKSHOP/SEMINARS, STUDY & TOURS (January - March 2005)

S.N.	Name	Position	Subject	Duration	Country
1.	Mr. Thaneswar Pd. Pokharel	S-5, Outreach Division	Issues and Prospects of Sustainable Agri. Dev. Under the Highland Environment In Nepal	15-25 Jan	Japan
2.	Mr. Yuga Nath Ghimire	S-4, Outreach Division	Issues and Prospects of Sustainable Agri. Dev. Under the Highland Environment In Nepal	15-25 Jan	Japan
3.	Mr. Ramji Khadka	S-3, Outreach Division	Issues and Prospects of Sustainable Agri. Dev. Under the Highland Environment In Nepal	15-25 Jan	Japan
4.	Dr. Surya Laxmi Maskey	Director, Crop & Horticulture	Regional Technical Coordination Committee & Annual Planning Review	2-8 Feb	Bangladesh
5.	Mr. Ganesh Sah	Chief, ARS, (Ranighat)	Regional Technical Coordination Committee & Annual Planning Review	2-8 Feb	Bangladesh
6.	Mr. Janmejaya Tripathi	S-4, WRP, Bhairahawa	Regional Technical Coordination Committee	6-8 Feb	Bangladesh
7.	Mrs. Bhawana Shrestha	T-6, Monitoring Division	Annual Planning Review	2-5 Feb	Bangladesh
8.	Mrs. Shanti Bhattarai	S-4, Soil Science Division	Regional Technical Coordination Committee	6-8 Feb	Bangladesh
9.	Mrs Junu Kamal Tuladhar	S-2, Soil Science Division	Symposium on Understanding Arsenic Behavior in Aqualizer Soils	16-18 Jan	Bangladesh
10.	Dr. Hari Bahadur K.C.	T-7, Agronomy Division	International Symposium on Plant Introduction	15-17 Feb	India
11.	Dr. Hira Kaji Manandhar	Chief, Planning Division	Capacity Enhancement Project (CEP) in Seed Pathology	14-23 March	Denmark
12.	Dr. Swoyam Prakash Shrestha	S-4, Animal Health Division	Vaccine and Antigen Production	26 March-8 April	Sri Lanka

Book Published



Crop specie based catalogue entitled “National Catalogue of Economically Valuable Landraces, Released Cultivars and Red List of Landraces” has been published by NARC, LIBIRD and IPGRI. The catalogue developed for general reference covers eight different crops: Pigeonpea, Fingermillet, Buckwheat, Spongegourd, Cucumber, Taro, Barley and Rice species collected from three distinct eco-regions: Jumla, Kaski and Bara representing high hills, mid hills and terai respectively. The catalogue gives information on special value/traits and diversity status of different species of respective crops. The catalogues of other crops species covering other parts of Nepal are necessary to be developed.



“Descriptors for Spongegourd” has been published jointly by NARC, LIBIRD and IPGRI that is expected to be useful in sponge gourd resources management. Spongegourd land races were collected from Bara and Kaski districts and PGR section at Agriculture Botany Division, NARC, Khumaltar and planted in Agriculture Research Station (Horticulture), Pokhara in 2003. Draft descriptors were developed and tested in the field experiment of spongegourd. Shape of leaf and fruit observed in the field were sketched. The authors of the book are Bal K Joshi, Hari B KC, Radha K Tiwari, Madhusudan Ghale, Bhuwan R Sthapit and Madhusudan P Upadhyay.

IFAD-Legume NTCC Meeting

A meeting of the National Technical Coordination Committee (NTCC) for the IFAD/ICRISAT Legumes Project: “Farmer Participatory Research into Integrated Management of Grain Legumes in Nepal” was held in Kathmandu on 6 January 2005.

The objective of the meeting was to present and review the findings of the researches at different sites in the year 2004 and to develop programs and work plan for the year 2005.

In the meeting, reports from different project site coordinating institutions, namely National Grain Legumes Research Program, National Oil Seed Research Program, Regional Agricultural Research Stations Nepalgunj and Lumle, Local Initiative for Biodiversity Research and Development (LI-BIRD) and FORWARD were presented for review. Observation by farmer representatives from different project sites/areas on the project was also held. The meeting worked out in preparing annual programs for the next year in each of the project sites as proposed by site coordinators.

The Meeting was held on the chairmanship of Acting Executive Director of NARC, Mr. DS Pathik and Director of Crop and Horticulture Research of NARC, Dr. SL Maskey.

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