

## A Quarterly Newsletter of Nepal Agricultural Research Council (NARC)

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October - December 2002

### NTCC for Rice-Wheat System Meet

Meeting of the National Technical Coordination Committee (NTCC) for Rice-Wheat System was held on 18 December 2002 at NARC, Khumaltar.

In the meeting chaired by Mr. Raghunath Prasad Sapkota, Executive Director of NARC, the rice-wheat research works and activities under Rice-Wheat Projects in Nepal was briefly presented by Mr. D.S. Pathik, the then National Rice-Wheat Project Coordinator and Director of Crop & Horticulture Research, NARC.

Reports on Rice-Wheat activities in three different sites: Naldung, Bhairahawa and Parwanipur were presented respectively by Ms. Shanti Bhattarai, Mr. Janmejaya Tripathi and Mr. Ganesh Sah. Review and discussion on rice-wheat system related issues and the achievement were undertaken.

At the conclusion, Dr. G.O. Ferrera, CIMMYT Scientist remarked the achievement of Rice-Wheat research.

#### ISSUE HIGHLIGHTS

- NTCC meeting of Rice-Wheat system
- International conference on wild rice
- Fisheries research review and planning meeting
- Research-extension coordination meeting
- Hybrid maize development at Khumaltar
- Callusing ability of anthers of Nepalese wheat cultivars
- Status of tea cultivation in Nepal
- Booking the mountains

### International Conference on Wild Rice

The First International Conference on Wild Rice was held in Kathmandu on 21-17 October 2002.

The Conference was organized by Green Energy Mission, Nepal (GEM-Nepal) sponsored by ICIMOD, IUCN, and USC Canada/Nepal. A total of 64 participants from eight different countries viz: China, India, Indonesia, Korea, Japan, Nepal, Philippines and United Kingdom participated the conference along with scientists from International Rice Research Institute (IRRI).

The main objective of this conference was to bring eminent rice scientists from different countries working on wild rice in one forum to review the work on wild rice field status in different countries of rice origin, utilization of wild rice at

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### Fisheries Research Review and Planning Meeting

Fisheries Research Division under Nepal Agricultural Research Council (NARC) in collaboration with Directorate of Fisheries Development/HMG and various non government organizations, held the fisheries research review and planning meeting at Godavary on 24 -27 December 2002.

The meeting held under chairmanship of Mr. Raghunath Prasad Sapkota, Executive Director of NARC, had an extensive deliberation on past research work and output/achievements in fisheries sector. Culture, breeding, post-harvest, technologies and extension of various fishes were presented in the meeting. The meeting had also an interactive discussion for future plan and

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*Fresh cold-water trout fish culture in private sector in Nuwakot district*

Nepal Agricultural Research Council (NARC) is an apex body for agricultural research in the country with the goal of poverty alleviation with sustainable growth of agriculture production through development of appropriate technologies in different aspects of agriculture

## Farmers' Field Day on Tomato

With the view to make vegetable farmers acquainted with the performance of new off-season tomato cultivars at Khumaltar, Horticulture Research Division under NARC organized a Farmers' Field Day on 24 December 2002.

A group of farmers along with scientists/researchers had field observation and interaction on off-season tomato cultivation.

In order to address the disease problem in off-season tomato cultivation, particularly, Bacterial wilt that causes a massive destruction of tomato crop, the Horticulture Research Division has developed some disease resistant open pollinated cultivars and 18 different Hybrid cultivars from their crosses with local varieties: Lapsigede, Manperkas etc.

## Exhibition on "Sustainable Soil Management"

An exhibition on Sustainable Soil Management was held at Nepal Administrative Staff College, Jawalakhel on 31 December 2002.

The exhibition was organized by Sustainable Soil Management Programme (SSMP) in collaboration with various institutions. About sixty organizations including Nepal Agricultural Research Council (NARC) participated in the exhibition and displayed experiences with the promotion of sustainable soil management in different districts. Service providers and supply side actors also offered their products and services for SSM promotion.

The Exhibition was inaugurated by Mr. B.R. Kaini, Director General of Department of Agriculture during which an interaction and remarks by invited speakers were held.

SSMP is implemented in collaboration with His Majesty's Government and Civil Society Actors of Nepal. It is financed by Swiss Agency for Development and Cooperation (SDC).

## Research-Extension Coordination Meeting

With the view to exchange ideas and information on research and extension and to strengthen collaboration and linkages among research-development institutions in livestock and crop sectors, the Research-Extension Coordination Meeting (RECOM) was organized on 30-31 December 2002 at Agriculture Research Station (ARS), Lumle.

In the meeting, agriculture researchers and extensionists from 11 different districts of Lumle ARS command area and representatives from related research and development institutions participated and interacted on issues and options and new research findings.

RECOM is the regular program that provides a common forum for people in agricultural research and development and to explore avenues of joint collaboration for participatory research and development.

## Booking the Mountains: A Book Fair and Exhibition

With the view to bring attention to the mountain information and knowledge and with the objective of imparting education, sharing and exchanging information and raising awareness, A Book Fair and Exhibition entitled "Booking the Mountains" was organized by International Centre for Integrated Mountain Development (ICIMOD) in Lalitpur from 10 -12 December 2002.

The three-day exhibition, participated by various organizations: NGOs, INGOs and government agencies including NARC had poster and publication display, street dramas, audio/video/cd screening, and sales of academic, scientific publications, agricultural products and so on.

The Exhibition was inaugurated in a special programme by Prof. Sun Honglie, Chairman of the ICIMOD Board of Governors.

The Exhibition was organized as one of the series of events held by ICIMOD to mark the International Year of Mountains (IYM) 2002.

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strategy in fisheries research and development

Culture and breeding technologies of various indigenous and exotic fishes have been developed under Nepalese condition that are now popular and widely cultured as a commercial production industry by extensive, semi-intensive and very few intensive as monoculture and polyculture. The pond fish culture started from very extensive with monoculture to polyculture and integration with livestock, poultry and vegetables to increase the productivity. Now the extensive practices changing to semi-intensive as well as intensive to get high production per unit area. In addition to that, some studies are being carried out every year to find out new techniques to enhance the fish production industry in the country with exciting achievement.

Fisheries Research Division of NARC, through Fisheries Research Stations at Godavary, Trishuli, Pokhara, Tarahara and at various rivers and farmers' ponds, has been conducting researches on different types of fishes like carp, tilapia, prawn, maghur, sahar, asala, katle, jalkapur, trout and ornamental fish and has developed complete packages of culture, breeding, feeding and post-harvest technologies for different fish species. Some technologies developed have been exported to other countries such as Pakistan, Bangladesh, Papua New Guini, Thailand, Bhutan as exchange of technologies.

A complete technology package developed after few years of studies for Rainbow Trout Fish culture has been remarkable and is adopted as commercial culture by farmers in private sector. Rainbow trout is an exotic high value cold water fish imported from Miyazaki prefecture, Japan.

In Nepal both cold and hot water fish culture in ponds, lakes, rivers, raceways have been practiced and rice-fish culture as well. In the Fiscal Year 2001/2002, about 35,000 mt of fishes was produced in Nepal.

## High yielding hybrid maize development at Khumaltar

Maize is considered as one of the oldest and most productive food plants and also known as queen of cereals at global level. Hybrid maize development is undoubtedly one of the most effective and fruitful technology for Nepal and research on the development of superior hybrids is now receiving greater attention due to high yield potential advantage over composite. Nepalese farmers are buying maize hybrid seed from

hybrid maize yield trials for last four years at Agriculture Botany Division, NARC, Khumaltar, KYM 33 × KYM 35 hybrid maize has been developed for mid hill condition of Nepal. The available data of hybrid research shows that this hybrid performed better than other tested hybrids and composites in various yield trials conducted at Khumaltar. In summer 2002, maize hybrid was tested at research station and at farmers field in three sites

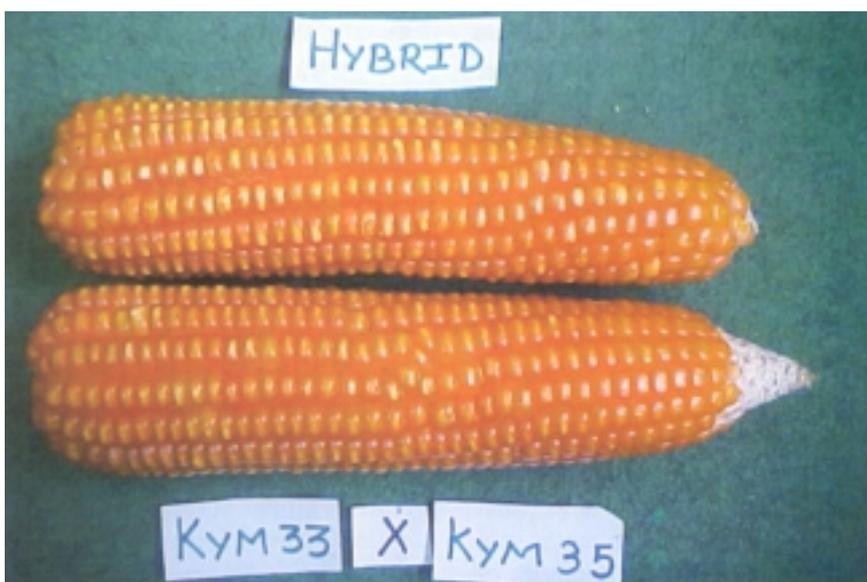
in yield and other agronomic traits. This F<sub>1</sub> single cross hybrid yielded as high as 14-ton/ha. KYM 33 × KYM 35 is prolific (ear to plant ratio high) and has orange kernel colour. Inbred lines of this hybrid also performed better than other tested inbreds in seed setting and other agronomic traits. Maize being the second staple food grain of the country and productivity being stagnant, in order to increase maize production, the high yield potential, KYM 33 × KYM 35 hybrid would certainly help to accelerate maize productivity in good management condition in mid hills of Nepal.

Agro-morphological characters of new hybrid:

1. Intermediate maturity (115-130 days)
2. Stay green leaf at harvest so used for fodder
3. Plant Height: 250-280 cm
4. Ear Height: 140-160 cm
5. Tolerance to Rust, Curvularia and very low Turcicum infection
6. Tight husk cover
7. Tolerance to ear rot
8. Kernel row number: average 14
9. Kernel number per ear: average 560
10. Ear length: average 21 cm
11. Grain colour and type: orange flint and bold
12. 1000 grain weight at 15% moisture: 435 gm
13. Physiological maturity: average 122 days
14. Emergence days: 8 days
15. Lodging tolerance
16. Grain yield at 15% moisture: 12 ton ha<sup>-1</sup>
17. Nutritional analysis: Protein – 10.88 %, Tryptophan – 1%

This hybrid can be distributed for general utilization at mid hill condition of Nepal at high input condition.

- Amit Priyadarshi and Bimal K. Baniya  
Agriculture Botany Division,  
NARC, Khumaltar



neighboring countries, and they are very much interested in Nepalese hybrid maize. So, after conducting several

(i.e. Khumaltar, Thankot and Banepa) where, KYM 33 × KYM 35 hybrid better yielded or at par with commercial hybrids

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different levels and *in-situ* conservation of wild rice in their original natural habitats.

In the conference 8 papers on country status of wild rice, 9 papers on utilization of wild rice, 4 *in-situ* conservation of wild rice and 2 weedy rice and related subjects were presented that were followed by deliberate discussions. Paper presentation by a Nepalese farmer Mr. Surya Prasad Adhikary on the utilization of wild rice *Oryza rufipogon* for developing improved submergence tolerant rice variety for the foothills of Nepal Himalayas was highly recognized.

During the conference, an exhibition of wild rice and related literatures from different participating countries and the International Rice Research Institute was held. A special display of 9 X 1.3 meter Art of Wild Rice Nature Conservation made by Mr. Mitsuaki Tanabe, Japan was one of the most significant components.

As a part of the conference, a wild rice field trip was also conducted around Lumbini Garden area – the Birth Place of Lord Buddha and Chitawan in Nepal to observe the original natural habitats of wild rice- *O. nivara*, *O. rufipogon* and *O. granulata*. The areas of wild rice species belong to the private farmers, and are vulnerable to extinction. Similar status exists in different parts of Nepal. (A detail information on wild rice field status is given in the book -Wild Rice in Nepal).

The participating members strongly felt that almost all countries (at least 76 countries) of rice origin must be having the same status of wild rice vulnerable to extinction. Therefore, this team suggests to the world through IRRI to develop the micro as well as mega projects on wild rice nature conservation in their original natural habitats in different countries of rice origin to preserve valuable genetic resources in nature.

The Conference, after a hard working out, finally made a resolution “Kathmandu Declaration on Wild Rice Nature Conservation”.

## Kathmandu Declaration on Wild Rice Nature Conservation

It was agreed by all the participants that lack of nature conservation, severe and continuous genetic erosion of wild rice (*Oryza* species) has been taking place in all the countries of rice origin. Such erosion will eventually lead to huge loss of useful genetic resources. Furthermore, it will stop the natural evolutionary process of rice in nature. This will be a major irreparable natural disaster done by human population on this only living planet. Moreover, information on wild rice is lacking at various levels-at local level to national and international levels, farmers to scientists level, etc. Because of such major constraints to natural survival of wild rice, the original sources of staple food of over half of the world population, this Conference felt an immediate need of creating most favorable environment for saving wild rice in nature. Under such critical situation, the conference made KATHMANDU DECLARATION OF WILD RICE NATURE CONSERVATION as below:

### 1. Establishment of an “International Network of Wild Rice (INWR):

The network could be coordinated through International rice Research Institute (IRRI), Manila Philippines. The present chairman of the ICWR – Dr. Gyan L. Shrestha may be requested to make necessary communication with all the involved institutions / individual participants and related authorities, and IWRN will be established.

**2. Follow-up of the ICWR:** This conference is the first of its kind in relation to the wild rice. This is just the viable seed we put into the soil. It must germinate, grow and mature. For this, such ICWR must be held at regular intervals. It is proposed that the next ICWR be held at IRRI. Wild Rice workshops at national and regional levels must be conducted at certain intervals to strengthen the wild rice program in all the countries of rice origin.

**3. Capacity Building for Conservation and Utilization of Wild Rice:** Every country of rice origin needs to strengthen capacity building for

conservation and utilization of wild rice. Wild Rice is the reservoir of useful genes for rice improvement. Rice biodiversity is essential for the whole future improvement of cultivated rice along with several uses including natural food of wild rice, eco-tourism, ornamental use, etc. This will help the nature in sustaining the wild rice nature conservation in their original natural habitats. For this purpose, each nation would need to strengthen its capacity building. Such capacity building includes basic human resources development, physical infrastructure development for nature conservation, laboratories and herbarium space development for utilization of wild rice, etc. National and international efforts must be enhanced and encouraged to get necessary financial and technical supports.

### 4. Public Awareness at Different Levels:

Every country of rice origin needs to create more favorable environment to develop public awareness at different levels – at grassroots level and at policy levels by using all means of electronic media, and related aspects. Even, towels with photos of wild rice prints would be good choice to make the common people familiar with wild rice. Promotion of *O. granulata* in the form of decorating plantlets in small plastic pots for decoration purposes in the rooms and meeting halls is another option to create public awareness about wild rice.

### 5. Fund raising Campaign for Development of Micro and Mega Projects on Wild Rice Nature Conservation and utilization:

The conference made a strong recommendation to develop micro and mega projects for wild rice nature conservation along with their utilization in different countries and regions of rice origin. Funding from GEF and other national and international agencies should be possible for immediate short term and long term projects for Wild Rice Nature Conservation and Utilization.

## Callusing ability of anthers of Nepalese wheat cultivars

Bal K Joshi and Hari P Bimb  
Biotechnology Unit, NARC

Wheat is the most important winter crop and 27 varieties so far have been released in Nepal. The production of haploid plants via anther culture provides a rapid route to complete homozygosity and to expression of recessive genes. It takes about 7 crop seasons of rice to develop homozygous line from cross through conventional breeding system while it is possible to develop homozygotes through anther culture in a single season.

Six genotypes of wheat from Wheat Breeding Unit, Agriculture Botany Division were selected to identify the suitable stage of anthers to be cultured and genotype with anther culture capacity. Seeds were grown in normal rice season during 2001 Khumaltar, Nepal. Standard agronomical practices were followed. Uninucleate stage is reported to be the best stage but practically it is difficult to recognize in the field. Therefore, distance based method of stage identification is considered here. The primary tiller from each cultivar was used for explants. Panicles from the tillers were sampled at the stage of 4, 6, 8 cm length from the base of flag leaf to auricle of last leaf. All panicles were kept in a refrigerator in darkness at 5°C for 6 days for pre cold treatment before dissecting out the anthers. Anthers from the central region of surface sterilized panicles were excised with fine forceps and scissors and plated

aseptically in the  $N_6$  medium. This experiment was laid out in factorial complete randomized design (two factors, genotype and stage of anther) with three replications. On an average 60 anthers were plated per genotype in 60 by 15 mm petri dishes at a density of 30 anthers per 10 ml of  $N_6$  medium. Culture were incubated in the dark at 25°C until calli were produced. All other procedures were as described by Liang and McHughen (1981), Zhou and Konzok (1989). Callus induction ability was calculated on the basis of the number of callus producing anthers after 40 days following inoculation. F statistics were estimated and tested using GenStat based on factorial analysis of variance.

Genotype and interaction effect were significant (Table 1). Stages of anthers were not significant. Highest callus formation was observed in Anna-4 and lowest in WK839 (Table 2 and Fig. 1 & 2). Anna-4 and PAL were more

responsive and Anna-1 and WK839 were less responsive. Anthers at the stage of 6 cm length from base of flag leaf to auricle of last leaf responded better to *in vitro* culture than other stages. Probably at this stage, pollen grains were at uninucleate stage. A correlation was found between the morphological features of the panicle and the stage of the pollen grains (Zapata et al., 1981). Zapata et al (1981) reported that, at 4-8 cm flag leaf distance, pollen grains were between the mid-nucleate and the early binucleate stages. This technique is simple and easy to identify the proper stage of pollen to be cultured.

Callus induction rate was very low in this study. To increase the induction rate, other factors including new genotypes should be studied in anther culture. Because androgenetic response is reported to be genotypically controlled (Ramos et al., 1994). Other options are wheat anther culture with maize hybridization and pollination with *Hordeum bulbosum*. A wheat variety which did not respond to anther culture, produced 1.1 plantlets per pollinated spike upon maize pollination (Bitsch et al., 1998). To get success in haploid breeding, it is suggested that, high callus producing genotypes should be identified so that less responsive cultivars can be improved by crossing with highly

Contd. on page 8

**Table 1. Analysis of variation for number of callus forming anthers**

Source of variation	Df	MS	P
Genotype	5	4.04	0.045
Anther stage (stage)	2	2.22	0.260
Genotype × Stage	10	5.06	0.005
Covariate†	1	1.30	0.370
Residual	35	1.58	
Total	53		

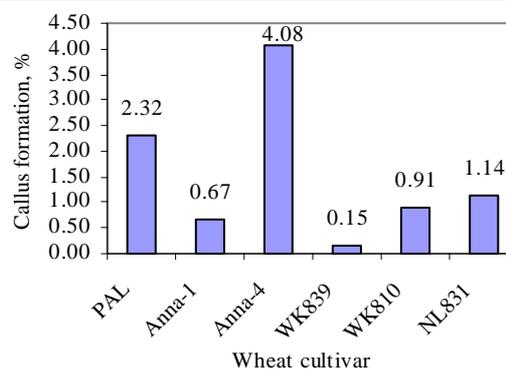
† Number of anther plated used as covariate.

**Table 2. Mean number of callus forming anthers, which is adjusted using number of anthers plated as a covariate, in six wheat cultivars**

Genotype†	Anther stage (distance, cm between base of flag leaf to auricle of the last leaf)			Mean
	4	6	8	
Anna-1	1.20	0.14	-0.39	0.32
Anna-4	-0.25	5.05	1.55	2.11
NL831	0.85	0.99	0.70	0.85
PAL	1.74	-0.15	1.34	0.98
WK810	0.64	1.38	0.56	0.86
WK839	0.01	0.31	0.32	0.22
Mean	0.70	1.29	0.68	0.89

	Genotype	Stage	Genotype × Stage
LSD	1.28	0.87	2.20

† PAL, Pasang Lhamu.



**Fig. 1. Callus formation rate from anther culture of 6 wheat cultivars (PAL, Pasang Lhamu).**

## Status of Tea Cultivation in Nepal

Tea is considered as the most popular beverage all over the world and its popularity is increasing tremendously. The history of tea in Nepal is as old as Darjeeling tea of India. In spite of its economic importance with export potential and production technologies constraints, this very commodity did not receive research priority until recently. Tea farmers are facing various types of production problems such as varietal, diseases/insect pest, weeds, soil and water management along with cost effective cultural management and its quality. Unless research is not focused to develop locally suitable low cost technologies to boost production, Nepalese tea (Orthodox) will not be viable to compete international market. Average productivity of the country is significantly low as compared to most SAARC countries due to appropriate technologies constraints. His Majesty's Government has already implemented Nepal Tea Policy 2057, under which farmers are provided soft loan with grace period for tea cultivation and technical advice to the most new farmers for nursery management and planting technique required through Chiya Bistar Yojana under NTCDB located at different parts of districts in the eastern hilly region. Nepal Government under Nepal Tea Policy 2057 has already set 40,875 ha of tea acreage to be covered within coming five-year period. However, during F.Y. 2057/58 area and production of tea in Nepal were 11,997 ha and 6,63,8082 kg respectively. Nepal is vigorously exercising to become member of WTO. In such condition, research focus on Orthodox tea is highly important to support the farmers tea industries for sustainable tea farming and make competitive in International market.

In order to be acknowledged of the status of tea cultivation and to identify major problems faced by the tea growers at present, field trips and surveys were recently conducted in tea growing districts of eastern Nepal. The joint team led by Mr. Chandra Bahadur Shrestha, Chief, Commercial Crop, NARC consisted of Mr Yagya Prasad

Giri, Senior Scientist, Entomology, NARC; Mr Pradip Kumar Yadav, Technical Officer, Plant Pathology, NARC; Mr. A.K. Jha, Technical Officer, ARS, Pakhribas, NARC; Mr. S. Yadav, Technician, Outreach site of ARS, Pakhribas at Fikkal; Mr. I.S. Shrestha, Agronomist, NTCDB, Regional Office, Birtamod, Jhapa; Mr. R. Sah, Chief Chiya Bistar Yojana, Fikkal; Mr. P. Thring, For chief Chiya Bistar Yojana Hile, Dhankuta; Mr. R. Yadav, Chief Chiya Bistar Yojana, Solma Terahthum; and Mr. J. Mandal Technician, ARS, Pakhribas. The following are the observation of the survey team.

### Tea varieties cultivated

Tea varieties which are grown in the hills of Nepal are Gumti selection, Takdah - 378, Takdah - 383, Bannock burn 157, Bannock burn 135, Phoobsering 312, Tarapur, Teenali, AV-2, Ambadi, and AV-10. Among them Gumti selection, Takdah - 378 and Takdah 383 are more common among the farmers.

In Terai, CTC tea grown are TV1, 9, 14, 18, 19, 22, 23, 25, 26, 27, 28, 29, 30, and

TS462, 449, 463, 464, 520, and 506.

### Disease and insects

During survey and visit in the farmers' field at Ilam ( Fikkal and Kanyam), Dhankutta (Hile) and Terathum (Solma) districts, blister blight and red rust are found the most common diseases of tea in the hills that caused significant yield and quality loss. Whereas in Jhapa district, the most destructive and widely spread diseases in tea are grey blight, black rot and red rust. As these diseases usually occur both in young and old leaves, they are known as leaf diseases of tea. Almost all varieties grown in the country are also found susceptible. In hills, white grub, stem borer, thrips and leaf caterpillar were observed prevalent and in terai, mites, thrips, tea mosquito and aphids insect pests were found to be present. These insects are not only causing yield and quality loss but also increasing cost of cultivation.

### Weeds

The followings are the most common weeds found associated with tea in Hills and Terai.

Weeds found associated with tea in hills and terai

<u>Local name</u>	<u>Common name</u>	<u>Scientific name</u>
1. Gandhe/Ganhki	Bill goat weed	<i>Ageratum conyzoides</i>
2. Suru/Dabhi	Cogon grass/Thatch grass	<i>Imperata cylindrica</i>
3. Dubo/Duibh	Bermuda grass	<i>Cynodon dactylon</i>
4. Banmara	Siam weed	<i>Uptorium odoratum</i>
5. Ratnaulo	Joint weed	<i>Polygonum Chinese</i>
6. Motha	Nut grass/Grass	<i>Cyperus rotundus</i>
7. Motha	Umbrella	<i>Cyperus iria</i>
8. Titepati	-	<i>Artemisia vulgaris</i> (Princeps)
9. Fern	-	-
10. Dungerephool	-	<i>Lantana camara</i>
11. Bethe/Bathuwa (white)	Lambs quarter	<i>Cheopodium album</i>
12. Bethe/Bathuwa (Black)	Goos foot	<i>Chenopodium murale</i>
13. Kane	Day flower	<i>Comelina benghalensis</i>
14. Dudhi	Snakeweed	<i>Euphorbia hirta</i>
15. Lunde/Tharhiya	Pigweed	<i>Amaranthus viridis</i>
16. Lunde/Tharhiya	Spiny weed	<i>A. spinosus</i>
17. Banso	Crab grass	<i>Digitaria adsendens</i>
18. Lajawati	Sensitive plant	<i>Mimosa pudica</i> (thorny)
19. Bhukul/Banbhutka	Black night shade	<i>Solanum nigrum</i>
20. Banso	Knot grass	<i>Paspalum sp.</i>
21. Gumma	-	-

(Reported by: Mr. C.B. Shrestha)

## TRAINING WORKSHOP/SEMINARS, STUDY & TOURS ABROAD (October - December 2002)

S.N.	Name	Position/Faculty	Subject	Duration	Country
<b><u>SEMINAR/WORKSHOP/MEETING</u></b>					
1.	Dr. Nanda Prasad Shrestha	Director/Livestock	3rd Meeting of the Asia-Pacific Group in Fisheries and Aquatic Research (GOFAR)	3-5 November	Malaysia
2.	Dr. Tek Bahadur Gurung	S-3/Fisheries	IACES Symposium	27 Oct-10 Nov.	USA
3.	Dr. Nanda Prasad Shrestha	Director/Livestock	South-Asia Regional Agro-Forestry Consultation Meeting	23-25 November	India
4.	Mr. Babu Ram Bastola	S-3/Pasture&Fodder	South-Asia Regional Agro-Forestry Consultation Meeting	23-25 November	India
5.	Mr. Netra Prasad Osti	S-3/Livestock	South-Asia Regional Agro-Forestry Consultation Meeting	23-25 November	India
6.	Mr. Ram Prasad Upreti	S-4/Pathology	International Agronomy Congress	26-30 November	India
7.	Mr. Gautam B Manandhar	S-3/Ag.Engg.	23rd Technical Advisory and the 22nd Governing Board Meeting of RNAM	25-27 November	China
8.	Ms. Shanti Bhattarai	S-3/Soil Science	Project Annual Meeting and 7th MSEC Assembly	2-7 December	Lao PDR
9.	Mr. Shreemat Shrestha	S-3/Ag.engg.	Project Annual Meeting and 7th MSEC Assembly	2-7 December	Lao PDR
10.	Mr. Bimal Kumar Baniya	S-4/Agronomy	South-Asia Network on Plant Genetic Resources Meeting	9-11 December	Sri-Lanka
11.	Mr. Raghunath P Sapkota	Executive Director	The 7th General Assembly of APAARI and Expert Consultation on Strengthening of Resource Partnership through Network and Consortia	2-4 December	Malaysia
<b><u>OBSERVATION</u></b>					
12.	Mr. Dhruva N. Manandhar	S-4/Entomology	Study visit to Kalingpong	3 <sup>rd</sup> week December.	India
<b><u>TRAINING</u></b>					
13.	Mr. Pragun Sundar Sainju	T-6/Soil Science	Training on handling and running soil physical analysis	15 Oct.-15 Jan. 2003	India
14.	Mr. Maheswor Prasad Shah	T-6/Soil Science	Training on handling and running soil physical analysis	15 Oct.-15 Jan. 2003	India
15.	Mr. Homnath Regmi	S-3/Horticulture	Training course on socio-economics aspects of conservation and use of native tropical fruits genetic resources in Asia	12-21 December	Sri-lanka
<b><u>STUDY</u></b>					
16.	Mr. Nanda Kishore Raya	T-6/Entomology	M.Sc. in zoology	15 Jan '03-14 Jan '04	TU/Nepal

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responsive ones. High callus producing cultivars may be useful in developing double haploid plants.

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Callus forming anther of wheat

### Poudel and Sah obtained Ph.D. Degree

Mr. Krishna Prasad Poudel and Mr. Bindeswor Prasad Sah Senior Scientists in Nepal Agricultural Research Council (NARC) have recently obtained Ph.D. degrees from Indian Veterinary Research Institute (IVRI), Izatnagar, and Acharya N G Ranga Agricultural University, Hyderabad, India respectively.



Dr. Poudel did his Ph.D in Veterinary Gynecology and Obstetrics. His research work in his Ph.D. course was on cryopreservation-induced damages and effect of chlorpromazine and some antioxidants on frozen-thawed spermatozoa of crossbred bulls.

In his research study he has found out that morphological, functional and biochemical damages to sperm cell caused by cryopreservation are severe in crossbred bull semen, therefore the fertility of frozen-thawed semen of these animals is reduced. The study recommends that additions of some membrane stabilizer (chlorpromazine) in combination in antioxidant (ascorbic acid) are effective to some extent in minimizing the cryodamages. The findings have practical application in improving the techniques of freezing crossbred bull semen for its use in assisted reproductive technologies including artificial insemination.

Dr. Poudel, born in 1961, obtained his B.V.Sc. and Animal Health degree from Punjab Agricultural University, Ludhiana, India under Colomb Plan. He had his M. Sc. in Tropical Animal Production and Health from University of Edinburgh, U.K. with British Council Scholarship.



Dr. Sah did his Ph.D. in "Genetic Analysis for Combining Ability in Rice and Induction of Doubled Haploids from Heterotic Hybrids" In his study he generated several segregating populations of rice using Mahsuri, Mandya Vijaya, MM 162, Vibhava, Krishna Hamsa Triguna Ajaya, IR 64, Phalguna and Rasi varieties. Out of 45 crosses, F<sub>1</sub> hybrids viz. Mahsuri/Vibhava, Mahsuri/MM 162, Mahsuri/Rasi, MM 162/Rasi, Mahsuri/Mandya Vijaya and Vijaya/Phalguna were selected for their superior performance in desirable direction for grain yield and most of the yield components. He has also established the cold pre-treatment temperature and duration required for the higher response of rice anther; found out Rasi and Pusa Basmati-1 as a highly responsive *indica* rice type for anther culture, and developed doubled haploids from some of the superior F<sub>1</sub> hybrids (Mahsuri/Mandya Vijaya, mahsuri/MM 162 and MM 162/Rasi).

Dr. Sah, born in 1958, had won the Indian Government Scholarship for the Ph.D. study. He had his B..Sc. Ag. from Tribhuvan University, Nepal and M.Sc. Ag. from University of Birmingham, U.K. In addition, he has got Master's of Arts degree in Sociology from India. He had had Gold Medal with Board 7th top position in High School (SLC) from Nepal in 1975.

**Patron:**  
Raghunath Prasad Sapkota  
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