WHEAT & BARLEY

NEWSLETTER

A Half Yearly Publication of DWR, Karnal

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Contents

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Photography

Rajinder Kumar Sharma

From the Project Director's desk

Fourth time in a row, India witnessed a record wheat harvest of 85.93 m tons from an area about 29.5 m ha despite the yellow rust incidence in some parts which was effectively controlled by the timely intervention and spray of appropriate chemicals. It is indicative of strong base, proactive actions and resilience of the Indian wheat programme. Wheat has enjoyed the highest benefit of technological breakthrough during the past thirty years. Both development and adoption of new innovations including varieties, have contributed significantly in increasing wheat and barley production and productivity which has helped in ensuring the productivity growth close to two per cent. It has been projected that approximately 100 m tons of wheat would be required by 2030 AD. If we continue to maintain a productivity growth rate of around two percent, the projected demand of 100 m tons seem to be a target well within the reach and may be achieved much before 2030. India continues to maintain second position in the world next only to China in wheat production.

The Directorate of Wheat Research is coordinating and facilitating the development, evaluation and identification of prospective genotypes of wheat and barley to be released by Central Varietal Release Committee, through its cooperating centres under All India Wheat and Barley Improvement Programme. So far, 382 wheat and around 80 barley varieties have been released and 122 genetic stocks developed and registered with NBPGR, New Delhi. These genetic stocks can be used as donors of different traits to develop improved varieties.

A yield gap of 10 to 15 q/ha have been observed between the frontline demonstrations and the farmers practice in various wheat growing zones. This gap can be easily bridged by adopting the available technologies to achieve the targeted wheat production. The Directorate of Wheat Research is making concerted efforts by organizing zone wise strategy planning meetings to transfer the available technologies. These meetings are being organized in collaboration with Department of Agriculture and Cooperation, GOI, New Delhi, Directorate of Wheat Development, Ghaziabad and State Agriculture Departments of various wheat growing states. The DWR regional stations at Flowerdale, Shimla and Dalang Maidan have made significant contributions in managing rusts and hastening of varietal development process, respectively. In barley, the efforts are specifically directed at developing malt and dual purpose varieties.

Wheat and barley research in India has entered an era of quality consciousness and efforts are in progress to develop product specific varieties suited to various growing conditions of different zones in the country. I congratulate the wheat family for another record harvest and wish all the best.

(Indu Sharma)

Varieties Released by CVRC

Wheat varieties released by CVRC during 2010-11

Name and parentage	Developed by (Name of the Institute)	Area of adoption	Production conditions	Grain yield (q/ha)	
				Average	Potential
HD 2985 (Pusa Basant) (PBW 343/PASTOR)	IARI, New Delhi	NEPZ	Late sown irrigated	37.7	51.4
HD 2987 (Pusa Bahar) (HI1011/HD 2348// MENDOS/IWP72/ DL153-2)	IARI, New Delhi	PZ	Timely sown rainfed & restricted irrigation	17.5 31.5	32.2 38.6
HS 507 (Pusa Suketi) (KAUZ /MYNA /VUL/BUC /FLK /4/MILAN)	IARI RS, Shimla	NHZ	Timely sown irrigated & rainfed	46.8 26.6	60.1 54.3
HI 1563 (Pusa Prachi) (MACS 2496*2/MC 10)	IARI RS, Indore	NEPZ	Late sown irrigated	37.6	51.7
WHD 943 (d) (GLARE/PLATA 16// AJAIA 3/SILVER 16)	CCS HAU, Hisar	NWPZ	Timely sown irrigated	48.2	63.9
NIAW 1415 (Netravati) (GW 9506/PRL//PRL)	ARS, MPKV Niphad	PZ	Timely sown rainfed & restricted irrigation	19.5 31.1	36.2 38.2
DPW 621-50 (PBW 621, DBW 50) (KAUZ//ALTAR 84/AOS /3/MILAN/KAUZ/4/HUITES)	PAU, Ludhiana & DWR, Karnal	NWPZ	Timely sown irrigated	51.5	68.5
WH 1080 (PRL/2*PASTOR)	CCS HAU, Hisar	NWPZ	Timely sown rainfed	30.8	44.4

(d) = durum wheat

Research Notes

DWRB 73: New malt barley variety for late sown conditions in NWPZ

The demand for malt barley as raw material for malting and brewing has increased in India in recent past. The developments in the cultivation of malt barley in last few years under contract farming by several private companies have opened up the field for barley cultivation because of increase in number as well as installed capacity of breweries. In India most of barley varieties under cultivation are of six-row types which are poor in malting quality, where as two-row type barleys are better in overall malting quality compared to six-row type. Previously six-row barley had advantage over two-row type in grain yield under Indian conditions. Efforts were made continuously over last several years to bridge the yield gap between the two types retaining the high malting quality. It has been experienced in last one decade that the efforts of popularization of malt barley in the areas under rice-wheat cultivation have given less success as the farmers are not willing to leave the wheat cultivation for barley. It was seen that in the dry belt in the states of Punjab, Haryana and Rajasthan barley is preferred by farmers in rotation with cotton, pearl millet and sorghum. The only problem in such areas is the delay in sowing of the Rabi crop. The major barley industries are targeting this area for growing malt barley to ensure regular cultivation of suitable varieties with good grain quality under late sown conditions. The barley network initiated a new trial series for late sown malt barley to give the suitable variety of malt barley as an option to the farmers with already released varieties for timely sown conditions.

As a result of these efforts, DWRB 73, a superior quality two-row malt barley variety which is comparable in grain yield to the six-row types being cultivated in the region has been developed at Directorate of Wheat research, Karnal following the two x six row hybridization (DWR17 / PL710) programme. This variety has been released and notified by the "Central sub-committee for crop standards, release and notification of crop varieties (CVRC)" recently for cultivation in NWPZ (Northern Rajasthan, Haryana, Western Uttar Pradesh, Delhi and Punjab) under irrigated late sown conditions. DWRUB 73 has given consistently better yield during three years under all India coordinated yield trials over zonal checks, DWRUB 52 (4.85%), RD 2668 (6.04%) and six-row check K 551 (3.75%). This variety of two-row group has clearly demonstrated the better or equivalent yield levels to that of the best six-row check (K 551) in the zone.

Yield (q/ha) of DWRB 73 and checks under irrigated late sown in NWPZ

Years	No. of Trials	DWRB 73	RD 2668(C)	DWRUB 52(C)	K 551 (C -R)	C.D.
2007-08	7	41.6	38.6	41.1	41.2	3.0
2008-09	11	37.0	35.3	34.9	36.3	2.86
2009-10	7	38.5*	-	35.9	35.0	1.32
Mean	25	38.71	36.58	36.92	37.31	

* Significantly superior

In agronomy trials also, DWRB 73 has shown superiority in grain yield over checks DWRUB 52 (5.2%), RD 2668 (10.9%) and K 551 (17.3%) at recommended dose of fertilizer. At other doses also it was always higher in grain yield than the checks. DWRB 73 showed high degree of resistance to leaf rust. DWRB 73 is comparable in resistance to yellow rust with checks DWRUB 52 and RD 2668, while the six row check K 551 is highly susceptible under artificial conditions.

The evaluation of multi-location grain samples for malting quality traits was undertaken during three consecutive years. The micro-malting analysis was performed and observations were recorded on different grain and malt quality traits as per the EBC (European Breweries Convention) procedure. In malting quality, DWRB 73 has shown comparable overall quality score to the best check DWRUB 52. It has specific advantages for important traits like proportion of bold grains, diastatic power, wort viscosity and hot water extract under late sown conditions.

There is a scope for contract cultivation of this variety of malt barley if given premium price to the farmers by the industry for growing better quality barley. Under the post economic liberalization era and with the increasing trend for consumption of bear and other malt based products like chocolates, energy drinks, malt whiskies and medicinal syrups in modern society in India, barley has become an important industrial crop. This will in turn reduce the burden of importing barley grain or malt by industries, to produce good quality malt. The new variety DWRB 73, is expected to meet the industrial demand of malt barleys in country and at the same time its higher yield levels under late sown conditions coupled with better quality will ensure its popularization among the farmers in cotton belt and other such areas where barley sowing gets delayed.

RPS Verma, B Sarkar, AS Kharub, Dinesh Kumar, R Selvakumar, Sneh Narwal and SS Singh
DWR, Karnal

Screening and identification of heat tolerant wheat genotypes

Mapping population RAJ 3765/ P 11632 consisting of 172 RILs was used for phenotyping for thermal stress tolerance. The population was sown along with parents under timely and late sown conditions to assess the thermal tolerance. Mean minimum temperature was higher by 0.60C before heading and 2.80C after heading under late sown conditions. Similarly maximum temperature was at par with timely sown conditions before heading and 4.60Chigher after heading. Heat degree days were more under timely sown conditions due to longer growth period. High temperature index was higher by 3000 units approx. during grain growth period under late sown conditions. The average maximum temperature of 7th week was higher by 6.4^{o}C under late sown conditions. On the basis of data recorded on phonological, physiological and yield contributing traits, thermal tolerant and susceptible lines identified. The RIL population was also evaluated at Hisar and Varanasi for thermal tolerance.

Thermal tolerant lines for various traits

Trait	Thermal tolerant lines
Grain Filling Duration	1, 2, 24, 39, 41, 43, 48, 52, 60, 65, 67, 69, 72, 78, 87, 88, 89, 111, 117, 121, 134, 143, 144, 146, 149, 150, 153, 166, 169
Grain Weight/ spike	1, 2, 43, 44, 48, 56, 60, 67, 90, 111, 114, 116, 124, 146, 149, 150, 157, 169,
Thousand grain weight	1,2,43,44, 48, 52, 56,67,75,111,116, 121,143, 146, 149,150,
Grain yield	2, 39, 41, 60, 83, 114, 117, 121,143, 146,149
Chlorophyll (CCM)	78,83,89,93, 111, 144,146
Chlorophyll fluorescence (Fv/Fm)	24, 25,46,60, 65, 78,87,89, 93,111, 116,117, 143,169

Sindhu Sareen, Ravish Chatrath and BS Tyagi
DWR, Karnal

In-silico mining of gene based simple sequence repeats in stem rust

The clonally reproducing rust pathogen rapidly evolves through stepwise mutational acquisition of new virulences and thus, resulting arms race between plant breeders and the pathogen is characterised by frequent and rapid resistance breakdowns. Therefore knowledge of evolutionary change in the pathogen can help plant breeders to develop more efficient strategies of rust resistance management in wheat. The abundance and inherent potential for extensive allelic variations in simple sequence repeats (SSRs) or microsatellites resulted in valuable source for genetic markers in eukaryotes. The abundance and organisation of SSR in the geneic regions of important fungal pathogens of wheat, black or stem rust (*Puccinia graminis* f. sp. *tritici*) were mined from the genomic database available at Broad Institute of MIT and Harvard, Cambridge (http://www.broadinstitute.org/). A total of 2,568 SSRs (perfect di-, tri-, tetra-, penta-, and hexanucleotide motifs with a minimum of six repeats) were identified from 20,567 genes in the genome of stem rust. Trinucleotides repeats were the most abundant repeats in the genome accounting 49.7% of SSRs followed by dinucleotides SSRs (47.7%). Tetra-, penta- and hexanucleotide repeats were the least frequent repeats accounting 2.6% of SSRs. Eleven types of dinucleotide repeat motifs were found and TC/CT repeat motifs were the most predominant followed by AT/TA motifs. Among trinucleotide repeats, 56 different types of repeat motifs were identified and the CAA repeat motif was predominant. This information on the nature of SSR motifs might be best to target for developing molecular markers in rust fungi for strain typing, population genetics, phylogenetics, genetic mapping and evolutionary studies.

Rajender Singh
DWR, Karnal

Morphological descriptors selected for defining genetic diversity in Indian bread wheat varieties

Almost 11,000 wheat lines including exotic and indigenous wheat, obsolete and currently used cultivars, landraces, genetic stocks and wild relatives are conserved as active collection at medium storage conditions at directorate. The major challenge in the applicability of germplasm in breeding programme is to define this collection for diverse traits and alleles. Core collection can help in capturing the majority of genotypes in a manageable number of accessions from a very large germplasm collection. Therefore, one of the objectives of bioinformatics project is to develop reference set or mini core set of Indian wheat lines using digitized database generated for Indian wheat lines released 1965 onwards as per PPVFRA recommended morphological descriptors. The three consecutive year's data for 36 morphological descriptors was evaluated using SAS software program. The means and standard deviation were calculated for all the 36 descriptors selected for statistical analysis and standard deviation value at 1.2 is taken as threshold to consider the descriptors as Non-Contributing and above this value was considered significant to select contributing character. On this basis, only 20 out of 36 traits were found to be significant in expression of diversity in a selected set of bread wheat varieties as given in table. This set of 20 descriptors was used to identify descriptors that are positively correlated and their significance during cluster analysis in genetic diversity expression. This information was used for hierarchical cluster analysis on the standardized quantitative data with a set of twenty descriptors. Ward's minimum variance method with an R2 (squared multiple correlation) of 0.70 for grouping the accessions was applied as per the PROC-CLUSTER program in SAS. The cluster tree revealed the grouping of a set of 258 wheat varieties in twenty seven genetically similar groups. These groups will be used to develop mini core set of Indian bread wheat varieties that will represent the genetic diversity available in Indian bread wheat. This mini core set will be valuable for biochemical and molecular interpretations of diverse alleles present in Indian genotypes for morphogenetic traits.

Contributing Characters	Non-Contributing Characters
Plant Growth, Auricle colour, Foliage colour, Flag leaf attitude, Plant Height, Ear length, Awn length, Flag leaf length, Leaf width, Ear waxiness, Leaf sheath waxiness, Leafblade waxiness, Peduncle waxiness, Outer glume Pubescence, Shoulder width, Shoulder shape, Beak Length, Grain Phenol Test, Brush hair length, Grain size	Coleoptiles colour, Auricle Pubescence, Days to Heading, Peduncle length, Peduncle attitude, Beak shape, Ear colour, Ear Shape, Ear Density, Awn colour, Awn attitude, Grain colour, Grain shape, Grain Texture, Grain germ width, Awn or scur presence

Rekha Malik, Sushila Kundu, Ajay Verma, Hemani Sharma and Ravish Chatrath
DWR, Karnal

Wheat rust races prevalent in the Nilgiri hills, Tamil Nadu

Nilgiri hills in Tamil Nadu acts as source of primary inoculum of rust diseases for central and peninsular India. If race scenario in Nilgiri hills is resolved in advance, it becomes possible to do anticipatory breeding of rust resistant varieties which will be suitable for cultivation in central and peninsular parts of India. With the same objective,as many as 506 samples of wheat brown rust and 146 of wheat black rust were analysed and identified with race patterns of already existing Indian races using the newly rejuvenated glasshouse facility at IARI, Regional Station, Wellington. Brown rust race 77-5 (121R63-1) was found to be the most dominant followed by race 77A (109R31), 77-8 (253R31), 17(61R24) and 77-7 (121R127) in Nilgiri hills of Tamil Nadu. Population of pathotypes 77-5 (121R63-1) and 77A (109R31) existed at par but both together were significantly higher from other pathotypes namely 77-7 (121R127), 77-8(253R31) and 17(61R24). In black rust, two pathotypes 40A(62G29) and 40-1(62G29-1) prevailed in equal proportions.

Jagdish Kumar
IARI RS, Wellington

Performance of wheat varieties under very late sown condition at Faizabad

The present experimentation was carried out under very late sown condition in partially reclaimed sodic soils (pH=8.6, EC= 2.0dSm^{-1}) at NDUAT, Kumarganj, Faizabad during Rabi 2010-2011. An over all, better yielding varieties coupled with many other promising traits were sorted out as desirable varieties for climatic change. These varieties viz K 8962, Unnat Halna, PBW 373, NW 1014 and NW 2036 were found better and shows tolerance to heat. Under this experiment 16 released varieties available at the centre were evaluated. Days to heading ranged from 55.7 days (Halna) to 63 days (PBW 373), days to maturity ranged from 88 days (Halna) to 96 days (PBW 373). Plant height ranged from 63.5 cm (Unnat Halna) to 96.7 cm in K 8962. Maximum ear length was observed in HD 2307 (10.50 cm) and minimum in Unnat Halna (6.87 cm). Maximum grain no./plant was found in HP 1744 (49.8) and minimum in HDR 77 (27.8). grain weight/ spike was highest in HP 1744 (1.91g). Productive tiller/sq.mtr. ranged from 149.7 (HD 2307) to 325.3 (NW 2036). Maximum grain weight was observed in K 8962 (38.1 g) followed by Raj 3765 (38.0g). In this experiment maximum yield/sq.mtr. was recorded in K 8962 (242.3g) followed by Unnat Halna (241.7g), NW 2036 (240.7g) and NW 1014 (233.7 g).

Morphological, yield and yield attributes of late sown varieties

Name of genotypes	Days to heading	Days to maturity	Plant height (cm)	Ear length / plant	Grain No. /spike	Grain weight/ spike (gm)	Tiller/ sq.m.	1000 grain weight (gm)	Yield/ sq.m.(gm)
Unnat Halna	59.7	88.7	63.5	6.87	38.0	1.25	286.7	34.8	241.7
K-8962	60.3	92.3	96.7	9.57	46.8	1.56	261.3	38.1	243.3
Halna	55.7	88.0	67.1	7.53	38.2	1.43	254.3	35.7	206.7
Raj-3765	60.3	95.0	77.4	9.50	38.6	1.62	244.3	38.0	233.5
NW -1076	61.0	93.3	73.3	9.10	48.4	1.57	243.7	29.5	203.3
PBW-373	63.0	96.3	70.7	9.13	40.6	1.40	234.0	32.7	213.8
HP-1633	60.3	95.3	86.7	9.50	40.8	1.70	240.3	36.5	208.9
DBW-14	58.0	89.7	70.5	9.27	40.6	1.46	204.3	33.8	191.7
NW-1014	58.7	92.7	83.7	8.67	46.2	1.64	244.0	36.3	233.7
NW-2036	60.7	90.0	73.7	9.33	49.7	1.69	325.3	32.7	240.7
HP-1744	62.0	94.7	71.2	9.53	49.8	1.91	268.0	34.4	201.7
HD-2643	61.3	96.3	76.7	8.63	40.5	1.71	244.3	37.6	228.3
HD-2285	57.0	90.7	73.8	7.90	31.0	0.94	284.0	29.0	211.7
UP-2425	60.0	92.3	69.5	9.67	37.6	1.17	168.0	36.3	175.0
HDR-77	61.0	96.0	75.4	9.33	27.8	0.88	243.3	23.2	225.0
HD-2307	62.0	96.3	70.3	10.50	38.3	0.59	149.7	25.1	166.7
Mean	60.1	93.0	75.0	9.00	40.8	1.41	243.5	33.4	214.1

BN Singh, SR Vishwakarma, Vinay Kumar Singh and R Ahmad
NDUA&T, Faizabad

Deputation Abroad

1. Dr. Vijay Laxmi Majumdar, Wheat Pathologist, SKRAU, ARS, Durgapura, Jaipur visited CIMMYT Mexico from 24.3.2011to 6.4.2011
2. Dr. Anju M. Singh, Sr. Scientist, Grain Quality Lab, IARI, New Delhi visited CIMMYT Mexico from 24.3.2011 to 6.4.2011
3. Dr. N.S. Bains, Sr. Wheat Breeder, PAU, Ludhiana visited CIMMYT Mexico from 18.3.2011 to 31.3.2011
4. Dr. S.K. Sethi, Sr. Wheat Breeder, HAU, Hissar visited CIMMYT Mexico from 18.3.2011 to 31.3.2011

Visitors

- Dr Gurbachan Singh alongwith DWR scientists visited farmers' fields in Karnal district to monitor yellow rust on March 26, 2011 and March 5, 2011.
- Dr SK Datta visited DWR on March 6, 2011 and monitored stripe rust in Karnal and Panipat districts.
- Twelve member Afghanistan Delegation led by Dr Darya Khan visited DWR Farm and farmers fields on March 5, 2011.
- Prof. Beat Keller and Ms. Severine Hurni from University of Zurich and Dr. Doris Hermann, Programme Manager, Indo-Swiss Collaboration in Biotechnology) visited DWR, Karnal on March 8-9, 2011 for participating in annual project review meeting.
- The following scientists and officials visited the Directorate from February 15-16, 2011 for IAP meeting held at DWR, Karnal.
    - Dr. Nick Austin, CEO, ACIAR, Australia
    - Dr.John Dixon, Principal Regional Coordinator, South Asia and Africa, ACIAR, ACIAR, Canberra, Australia
    - Dr. Paul Fox, Research Programme Manager, Crop Improvement and Management, ACIAR, Canberra, Australia
    - Dr. Richard Trethowan, Professor of Plant Breeding
    - Director of PBI, Narrabri, University of Sydney, Australia

- Dr. Tim L Setter, Principal Scientist, Department of Agriculture and Food Western Australia (DAFWA)
- Dr. Howard Eagles, University of Adelaide, Australia
- Dr. Richard Brettell, Dr. Harbans Bariana and Dr. Urmil Bansal, University of Sydney, PBI, Cobbitty, Sydney
- Dr. Michelle Watt, Research Scientist and Project Leader, CSIRO Plant Industry, Canberra, Australia
- Dr. Julie M Nicol, Soil Borne Wheat Pathologist, ICARDA-CIMMYT Wheat Improvement Program, CIMMYT Global Wheat Programme
- Dr. Larry Gusta, University of Saskatchewan, Canada

Meetings and Trainings

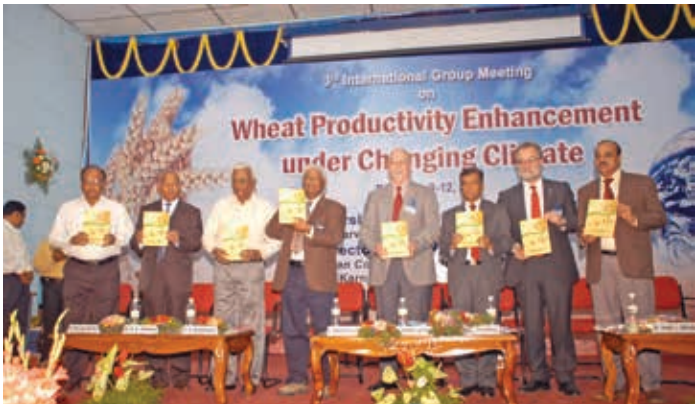
Organized Plant Variety and Farmers' Rights Protection Act Awareness Programme for farmers and state Government officers at DWR, Karnal on January 4, 2011. In all more than 100 farmers and officers participated from the states of Haryana, Punjab, Rajasthan and Uttar Pradesh.

Organized winter school on Marker assisted Selection for Enhancement of Rust Resistance and Quality Traits in Wheat at DWR, Karnal from January 5-25, 2011.

Organized Seed Enterpreneurship Development in Wheat training programme at DWR, Karnal from February 25-26, 2011.

Organised training from January 29 to February 2, 2011 on, "Improved Wheat and Barley Production Technologies" for farmers from Bharatpur (Rajasthan).

Organized 3rd International Group Meeting at UAS, Dharwad from February 9-12, 2011.



Organized Annual Science Meeting of IAP-MAWB at DWR, Karnal from February 15-16, 2011.

A meeting of ISCB project was organized at the Directorate from March 8-9, 2011.

15th Research Advisory Committee (RAC): The RAC meeting was held at DWR, Karnal, on March 30, 2011 under the Chairmanship of Dr HK Jain, Former Director, IARI, New Delhi. The members (Dr Bijay Singh, National Professor, PAU, Ludhiana; Dr RD Mishra, Former, Dean (Agriculture), GBPUA&T, Pantnagar and Dr DV Singh, Former Head, Division of Pl. Pathology, IARI, New Delhi), Project Director and all the scientists attended the meeting.

Organised the workshop on, "Opportunities and challenges in wheat marketing in India", on March 18, 2011. Participants from State Department of Agriculture, Cooperating farmers, Rural Solutions, South Australia, CCSHAU Hisar, DWR, HAFED, FCI participated in the workshop.

Transfer of Technology

Farmers' Days

19.03.2011	Farmers' Day at village Darar under ACIAR project by DWR,
19.03.2011	Farmers' Day at village Ramba under ACIAR project by DWR
21.03.2011	Farmers' Day at village Kalri under ACIAR project by DWR
23.03.2011	Farmers' Day at village Chhapar under wheat frontline demonstration by DWR
25.03.2011	Farmers' Day at village Thuian, Fatehabad under barley front line demonstration by DWR

26.03.2011 Farmers' Day at village Ramba, under Bioversity project by DWR

26.03.2011 Farmers' Day at village Taraori under Bioversity project by DWR

08.04.2011 Farmers' Field day under bioversity Project at Ludhiana

Kisan Mela/ Exhibitions Organized/ Participated

•	Exhibition	4-5 Jan., 2011	NHRDF, at Salaru
•	Rabi Kisan Mela	1 March, 2011	CSSRI, Karnal

Awards

•	NHRDF, Salaru Karnal	4-5 Jan., 2011.	Won 1st prize for stall
•	CSSRI, Karnal	1 March, 2011	Won 1st prize for stall

Joining/ Promotions/ Transfers/ Retirements

Joining

•	Dr Karnam Vanktesh	07.01.2011
•	Dr Vishnu Kumar Goyal	10.01.2011
•	Mrs Anita Meena	10.01.2011
•	Sh Tara Chand Sharma, F&AO	21.03.2011

Promotions

•	Sh. Yogesh Kumar, T-6	16.01.2011
•	Smt Shanti, AAO (Shimla)	31.01.2011
•	Dr Om Parkash Dhillon, T-7	08.04.2011
•	Sh Suresh Ram, SSS(MACP)	04.03.2011
•	Sh Lok Raj, T-2	22.02.2011
•	Sh Ronak Ram	10.05.2011
•	Sh Suresh Kumar	16.05.2011
•	Sh Ishwar Singh	10.05.2011
•	Sh Swaroop Chand, T-1, Driver	18.05.2011
•	Sh Vinod Kumar, T-1, Driver	18.05.2011
•	Sh Rajbir Singh, T-1, Driver	18.05.2011

Transfers

•	Sh Ved Prakash	05.03.2011
•	Sh. Desh Raj, SSS	30.05.2011

Retirements

•	Dr. S.S. Singh, Ex. Project Director	30.04.2011

•	Dr. Karamjeet Singh, Sr. Scientist	30.04.2011