



Proceedings of the 14th Meeting of the
Research Advisory Committee
~ 3rd April, 2010 ~



Directorate of Wheat Research
Karnal 132001

**DIRECTORATE OF WHEAT RESEARCH
KARNAL – 132001**

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Meeting of the 14th Research Advisory Committee (RAC) was held at Directorate of Wheat Research, Karnal, on 3rd April, 2010. The following members attended the meeting.

Dr. H. K. Jain, Former Director, IARI, New Delhi	Chairman
Dr. R. G. Saini, Former Head, Deptt. of Pl. Breed. & Genetics, PAU, Ludhiana	Member
Dr. R. D. Mishra, Former, Dean (Agriculture), GBPUA&T, Pantnagar	Member
Dr. D. V. Singh, Former Head, Division of Pl. Pathology, IARI, New Delhi	Member
Dr. S. S. Singh, Project Director, DWR, Karnal	Member
Dr. Ravish Chatrath, Principal Scientist, DWR, Karnal.	Member-Secretary

The meeting was also attended by all the Principal Investigators of various programmes including representatives of Regional Station, Flowerdale, Shimla and Dalang Maidan, Lahul Spiti (H.P.) along with all the scientists of DWR, Karnal.

At the onset, Dr. Ravish Chatrath, Member-Secretary welcomed the Chairman, Members and all the participants and presented the agenda to RAC members. Briefing the members about the major achievements of the Directorate, the Project Director, Dr. S.S. Singh emphasized that the country is looking forward to a bumper wheat production from the current season. He also emphasized the importance of this production so as to offset any imbalances due to decline in rice production in the last *kharif* season. He also highlighted the various issues of wheat production during the last cropping season along with wheat varieties released during that period. Dr. S. S. Singh was also confident about the capacity of the Directorate to take up any future challenge of wheat production to meet our growing demands.

The Chairman, Dr. Jain, in his opening remarks said that wheat and rice are the lifeline of food security in India. He reiterated the contribution of AICW&BIP as quite impressive and further stated that India is the only country to have a successful coordinated programme in most of the crops. Since wheat is becoming a dominant cereal world wide, the chairman stressed upon the need to double the wheat production in next five years.

Referring to the research and extension gaps, the Chairman said that there is a basic need to bridge any such gaps if wheat production is to be doubled. He also focused on the need to analyze the management gaps, which are more important. Acknowledging the

contributions of wheat research, he recapitulated that the AICW&BIP of 1960-70's was the strongest one and now there is a need to strengthen all the cooperating centers. The Directorate needs to be proactive in this regard and should fix season-wise targets. He also emphasized on the need for a district by district analysis of the problems and their solutions. The Directorate should take into confidence and interact with the state departments of agriculture on regular basis. The challenge to further increase the yields, even though a high genetic potential has been attained, needs to be taken sincerely. It was noted that India's wheat programme continues to be dependent to a significant degree on the advance breeding lines of CIMMYT. The following table shows the percentage of varieties based on direct selection from CIMMYT vis-à-vis through crosses developed by the coordinated centre. Some of the cooperating centres have hardly released a variety developed through their own crosses. It is the job of the coordinator to make sure that all the centres receiving financial resources should be active and make large crosses of their own. CIMMYT's material remains very valuable, but it should be mostly used in crosses.

	Varieties released		
	Total	Indigenous	Exotic
2007-2009	20	18 (90 %)	02 (10%)
2001-2006	33	27 (82 %)	06 (18 %)
1995-2000	35	22 (63 %)	13 (37 %)
1990-1994	19	08 (42 %)	11 (58 %)
1986-1989	23	14 (61 %)	09 (39 %)
1980-1985	46	19 (41 %)	27 (59 %)
Last 29 years	176	108 (61 %)	68 (39 %)

Dr. Ravish Chatrath, Member Secretary of RAC presented the action taken report of the 13th RAC meeting which was subsequently approved by the Committee (Annexure –I). The RAC members showed satisfaction on the action taken by integrating the suggestions into new projects being formulated at DWR level.

The Project Director, Dr. S. S. Singh initiated the main agenda of the meeting with a presentation on 'Opportunities for enhancing wheat production in the country'. He informed the house that during 2008-09 the country harvested 80.58 million tons of wheat from an area of 27.8 million hectares, which is an all time highest in India. He gave detailed information about wheat production, area and productivity of the states and different wheat zones. The Project Director speculated a higher wheat production this season also as there were low incidences of rusts and temperatures were congenial for wheat crop. He also emphasized on having short term strategies and a need to phase out susceptible wheat varieties. He said that we should

focus more on pre-breeding activities to broaden the genetic base of our genotypes. Amongst the new researchable issues, focused attention is required on specific biotic and abiotic stresses. He also emphasized the role of biotechnological interventions for enhancing the heat, drought, salinity and water logging tolerance, disease resistance and quality improvement, including nutritional aspects. Efforts are being made to enhance the yield potential of wheat varieties through the use of winter wheat, bultre germplasm, synthetic hexaploids from CIMMYT and Chinese sub-compactoid accessions, alien species and exploitation of heterosis for the production of hybrids using CMS approach. At the end the Project Director proposed the need for a wheat research institute, keeping in view the importance of the crop. The main mandate of the institute will be coordination along with the research programmes.

The progress reports of various programmes of the Directorate were presented by the respective Principal Investigators viz., Dr. Jag Shoran (Crop Improvement), Dr. A.K. Sharma (Crop Protection), Dr. Y. P. S. Sharma (Regional Station, Flowerdale), Dr. R.K. Sharma (Resource Management), Dr. R.K. Gupta (Quality & Basic Sciences), Dr. R.P.S. Verma (Barley) and Dr. Randhir Singh (Social sciences). The Chairman and the members interacted with the scientists during the presentations and they appreciated for the achievements made in each discipline.

The Chairman, Dr. H. K. Jain concluded the meeting by putting forward the important recommendations in consultation with the expert team members. He expressed his satisfaction and appreciation for the good work being carried out at DWR. He also thanked the experts and experienced members for their advisory role in shaping the programme.

The meeting ended with a vote of thanks to the chair and members by Dr. Ravish Chatrath, the Member Secretary.

RECOMMENDATIONS

On the basis of the presentations, discussions and the suggestions given by the RAC members, the following recommendations were made:

- The Directorate should come out with a blue-print of the action plan to double national wheat yield in five years. Both macro level (state) and micro level (district) analysis should be done to identify the constraints in wheat production.
- For proper management of tillage operations and irrigation management, RAC recommends a separate section of agricultural engineering at the Directorate.
- Attempts should be made to broaden the genetic base of wheat varieties. Progenitors of present day hexaploid wheat and old varieties (such as Sonalika, HD 2329) should be revisited for incorporating new genes. Spring x winter crosses should be continued to harness the stress tolerance traits from winter wheat in the background of spring wheats. The Chairman proposed that the breeders should make a large number of crosses so that a lot of variation is generated. At workshop the crossing program be reviewed for main wheat breeding centers / universities.

- Some of the major centres have shown a decline in their contributions. The Project Director should discuss these issues with the Vice Chancellors offering such help as may be needed to strengthen them. The matter should also be discussed with the senior officials of ICAR like DDG (Crop Science).
- Possibility of increasing area under wheat in NEPZ and far-east including Manipur and West Bengal should be explored. A survey may be conducted by Directorate where one crop is grown to introduce wheat as a second crop. Collaboration with Central Agricultural University (CAU), Imphal is needed to access the possibility of growing high yielding wheats in North East Indian states.
- DWR should strengthen its cooperating centers. An in-depth analysis should be done as to why the centers are not making the kind of contribution to the program as they used to do earlier. Steps should be taken to strengthen the centers.
- New ideas / technologies be innovated to reduce the cost of irrigation and fertilizer through integrated nutrient management and minimum tillage. An experiment may be designed involving other cooperating centers so that area specific recommendations are given.
- In the interest of basic research DWR should have PhD students in collaboration with IARI, PAU, HAU and GBPUA&T. The students will do the course work at their own university/institute and will carry out research under the guidance of a scientist at DWR. DWR should also have a number of post-doctorates for strategic research such as that relating to synthesis of bread wheat from its progenitors so that genes for resistance can be transferred into improved varieties. Moreover, research in biotechnology will be strengthened with the induction of post doctorate and PhD students.

Other important recommendations

- DWR should make region/zone wise recommendations rather than generalized ones.
- The packages and practices (area wise) for wheat crop should be provided to farmers and state workers well before the season.
- Krishi Darshan program on Door-Darshan (All India Radio) may be used as a mean to spread awareness for new technologies among the farmers during wheat crop season.

H.K. Jain
(H.K. Jain) 18/7/10
Chairman

Research Advisory Committee
Directorate of Wheat Research
Karnal

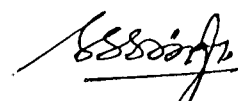
**DIRECTORATE OF WHEAT RESEARCH
KARNAL**

Action taken report on the recommendations of 13th RAC held at DWR, Karnal, on March 3, 2009 and chaired by Dr. H.K. Jain, Ex-Director, IARI, New Delhi.

	Recommendations	Action taken
	<p>Emphasis should be given on developing varieties having tolerance to heat, drought, and lodging. The genetic stocks for these traits should be developed in good agronomic backgrounds.</p>	<p>Two network projects on thermal tolerance and drought tolerance in wheat have been initiated during this crop season</p> <p>25 entries of AVT final year have been included in multilocation heat tolerance trial being conducted at 7 centres.</p> <p>Eighty two indigenous germplasm, genetic stocks and synthetic hexaploids are being screened for heat tolerance in poly house as well as late sown condition in field.</p> <p>Mapping populations of Raj3765/P11632, Raj4014/HUW510 and Halna/Raj4014 are being phenotyped for terminal heat tolerance.</p>
	<p>With climate change and rise in temperatures the wheat crop is expected to suffer yield loss specially during the tillering and the ripening phase. The RAC recommends that a new shuttle breeding programme should be started in the course of which segregating populations will be exposed to different temperatures. For this purpose suitable locations should be identified eg., Karnal and Durgapura.</p>	<p>A shuttle breeding programme involving various centres in eastern and peninsular India under the rice-wheat project is underway.</p>
	<p>Substitution of chromosomes from different species of wheat should be tried to generate new variability and create new ideotypes. Spring x winter crosses be continued to harness the stress tolerance traits from winter wheat in the background of spring wheats.</p>	<p><i>Ph</i> mutant line has been crossed with five <i>aestivum</i> and <i>durum</i> wheat varieties to obtain chromosomal substitutions from wild species.</p> <p>Winter x spring hybridization programme is being pursued in cooperation with VPKAS, Almora. During 2009-10 crop season 45 F₂s were supplied to six cooperating centres for selection under prevailing agroclimatic conditions. A total of 37 F₁s have been raised at Karnal during the ensuing crop season for further utilization.</p>

<p><i>Rht1</i>, <i>Rht2</i> (from Indian material) and <i>Rht 8</i> genes (Italian material) be tested and used for lodging resistance without compromising yield and grain size. Old triple gene dwarf varieties like Hira, Moti, Shera etc should be re-tested as the weather conditions in April/March have become even more turbulent.</p>	<p>Work has been initiated in this direction</p>
<p>Possibility of increasing area under wheat in NEPZ and far-east including Manipur and West Bengal should be explored. A survey may be conducted by Directorate where one crop is grown to introduce second crop as wheat.</p>	<p>Coochbehar, a funded centre of AICW&BIP, located in West Bengal, is promoting wheat to replace boro rice in West Bengal.</p>
<p>Programme on durable resistance be strengthened. New genetic stocks be developed by pyramiding the new resistant major as well as minor genes. Programmes on emerging biotic stresses like powdery mildew, leaf blight, Karnal bunt, head scab and aphid resistance should be taken up.</p>	<p>Two RIL populations viz., BW11/C306 for brown rust (100 lines) and HI977/HD2329 for stripe rust (105 lines) have been developed for adult plant resistance.</p> <p>Multilocation phenotyping of 728 RILs for HLB is underway at six centres for obtaining durable resistance against leaf blight.</p> <p>Two new genetic stocks (LBRL11 and LBRL13 possessing leaf blight resistance have been registered with NBPGR, New Delhi.</p>
<p>DWR may organize the coordinated trials with other centers over a number of years to refine the tillage technology which will save water and also reduce the cultivation cost.</p>	<p>Trials on RCTS are under progress at various AICW&BIP centres.</p>
<p>There is need to reschedule, state-wise, the sowing dates for wheat production in view of the varietal spectrum of the area. Such a planning will help the state departments and farmers in their efforts for further increasing the wheat production in the country.</p>	<p>It is important to reschedule the sowing dates and the state agricultural universities take care of it by routinely updating the package of practices of their respective states. Directorate also conducts dates of sowing trials on zonal level.</p>
<p>Sustainability of zero tillage and effect of available nutrients on long term basis should be determined to avoid any third generation problems. There is also a need to confirm if the rotary tillage is better than conventional and / or zero tillage keeping all pros and cons in mind.</p>	<p>The long term experiments has already been started to address these issues.</p>

	<p>Characterization of herbicide cross resistance should be done as a strategy to meet the future challenges on weed management in wheat.</p>	<p>The experiments are in progress to characterize the herbicide cross and multiple resistances in <i>Phalaris minor</i>.</p>
	<p>Effect of residue management options (including surface retention) on soil properties and productivity should be worked out.</p>	<p>The long term experiment is in place to evaluate the effect of residue management options, including surface retention, on soil properties and productivity.</p>
	<p>Studies on various protein fractions like glutenin, gliadin, albumin and globulin and their influence on the quality of various wheat products should be carried out.</p>	<p>Thirty two released wheat varieties were fractionated for various protein fractions and their role evaluated. The influence of HMWGS, LMWGS and γ-gliadin studied in detail.</p>
	<p>In varietal release process, due consideration should be given to end product quality. This will cater to the need of food processing industries.</p>	<p>During varietal identification committee meeting, due consideration is given to end product quality for identification and release of wheat varieties.</p>
	<p>The Chairman proposed that a News Letter on "Futuristic Wheat Research" be started consisting of abstracts / short notes on new innovations. This will serve as a means to provide first hand information to wheat researchers in India.</p>	<p>A six-monthly newsletter "DWR News" will carry abstracts/short notes on new innovations, as suggested by RAC</p>



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