PROCEEDINGS OF THE SIXTH MEETING OF RESEARCH ADVISORY COMMITTEE (RAC) AND THIRD MEETING OF RECONSTITUTED RAC UNDER THE CHAIRMANSHIP OF DR E A SIDDIQ AT NBPGR, NEW DELHI ON 14-15 MAY 2004

The sixth meeting of Research Advisory Committee (RAC) and third meeting of re-constituted of RAC, was held under the Chairmanship of Dr. E A Siddiq. The eleven members of re-constituted RAC and the special invitees are as follows:

1.	Dr. E A Siddiq National Professor Directorate of Rice Research Rajendranagar, Hyderabad 500 030	Chairman
2.	Dr. A S Khehra 903, Phase 3-B-2, Sector 60, Mohali Chandigarh	Member
3.	Dr. K.L. Chadha Former DDG (Hort.) ICAR and National Professor, 1082, B-10, Vasant Kunj, New Delhi 110 070	Member
4.	Dr. P. Pushpangadan Director, NBRI, Lucknow (UP)	Member
5.	Dr. B L Jalali CCS HAU, Hisar (Haryana)	Member
6.	Dr. R K Arora Former Coordinator, IPGRI South Asia Office, Ch. Devi Lal NASC Complex DBS Shastri Marg, Pusa, New Delhi 110 012	Member
7.	Dr D V Seshu 208, Park View Enclave Road No 2, Banjara Hills, Hyderabad 500 033	Member
8.	Padmashri Chandi Dan Detha, (Progressive Farmer) Roopayan Sansthan, Borunda Dist. Jodhpur (Rajasthan)	Member
9.	Dr. S Prakash Tiwari	Ex-Officio Member

ADG (Seeds), ICAR,
New Delhi 110 001

10. Dr. B. S. Dhillon — Ex-Officio Member
Director, NBPGR,
New Delhi 110 012

11. Dr P. C. Agarwal — Member Secretary
Principal Scientist,
NBPGR, New Delhi 110 012

Special Invitees from NBPGR

12	Dr. J.L. Karihaloo	Project Director, NRC DNA FP
13	Dr. S.S. Malik	HoD, Plant Exploration and Collection
14	Dr. Umesh Srivastava	Ex-member Secretary
15	Dr. Arjun Lal	HoD (Act.), Plant Quarantine
16	Dr. A. K. Singh	HoD, Germplasm Conservation
17	Dr. Mahendra Singh	HoD, Germplasm Evaluation
18	Dr. R. V. Singh	O/I, Germplasm Exchange Unit
19	Dr. R. P. Dua	O/I, UUP
20	Dr. B.B. Mandal	O/I, TC&CP Unit
21	Dr. R.C. Agrawal	O/I, ARIS Unit
22	Dr. S.K. Pareek	PI, NATP Plant Biodiversity
23	Dr. R.K. Tyagi	Senior Scientist, TC&CP Unit
24	Dr Rekha Chaudhary	Senior Scientist, TC&CP Unit
25	Dr. Pratibha Brahmi	O/I, PGR Policy Planning
26	Dr.K.V. Bhat	Senior Scientist, NRC DNAFP
27	Dr. G.J. Randhawa	Senior Scientist, NRC DNAFP
28	Dr. K.C. Bhat	Senior Scientist, Plant Exploration and Collection
29	Dr. K.K.Gangopadhyay	O/I, NBPGR Regional Station, Srinagar
30	Dr. V.D. Verma	O/I, NBPGR Regional Station, Shimla
31	Dr. K.S. Negi	O/I, NBPGR Regional Station, Bhowali
32	Dr. D.K. Hore	O/I, NBPGR Regional Station, Umium, Shillong
33	Dr. N.K. Dwivedi	O/I, NBPGR Regional Station, Jodhpur
34	Dr. I.P. Singh	O/I, NBPGR Regional Station, Akola
35	Dr. J.B. Tomar	O/I, NBPGR Regional Station, Ranchi
36	Dr. D.P. Patel	O/I, NBPGR Regional Station, Cuttack
37	Dr. K.S. Varaprasad	O/I, NBPGR Regional Station, Hyderabad
38	Dr. Z. Abraham	O/I, NBPGR Regional Station, Thrissur
39	Mr. P.K. Jain	SAO
40	Mr. B.K. Bansal	F. & A. O.

Four members of the RAC, namely Drs. A S Khehra, K. L. Chadha, D V Seshu and the Progressive Farmer, Padmashri Chandi Dan Detha could not attend the meeting.

The meeting started according to Agenda items.

AGENDA ITEMS FOR 6th RAC (14-15 May 2004)

I Welcome and introductory remarks by the Director, NBPGR

II. Remarks by the Chairman and Members

III. Confirmation of minutes of the 5th RAC meeting held on 2-3 June 2003

IV. Presentation of Action Taken Report (ATR) of the last RAC (Annexure-I, Page-13)

V. Presentation of activities and achievements of the Divisions/Units -NBPGR

Plant Exploration and Collection (Annexure-II)

Germplasm Exchange (Annexure-III)

Plant Quarantine (Annexure-IV)

Germplasm Evaluation (Annexure-V)

Germplasm Conservation (Annexure-VI)

Tissue culture & Cryopreservation (Annexure-VII)

DNA Fingerprinting (Annexure-VIII)

ARIS (Annexure-IX)

PGR policy (Annexure-X)

AICRP on UUC (Annexure-XI)

VI. Confirmation of the recommendations of SRC (Annexure-XII)

VII Any other item with the permission of the Chair.

1. NRC on DNA Fingerprinting be declared as ICAR referral Centre for DNA fingerprinting of plant varieties and germplasm
2. On-farm conservation of rice in lower Subansiri and Lohit district of Arunachal Pradesh

I. Welcome and Introductory Remarks by the Director, NBPGR

At the outset the Director NBPGR, Dr. B. S. Dhillon, welcomed the honourable Chairman, Dr. E. A. Siddiq, members of RAC and special invitees. In his introductory remarks, he briefly presented the salient achievements of the Bureau which are presented Division/ unit wise below:

- Plant Exploration and Germplasm Collection: One hundred and seventy-eight explorations including four special missions were undertaken. Explored several areas of the country for the first time and collected the valuable germplasm. Two new species of *Citrus* and *Musa* were collected. The gap analysis on cultivated and wild species was focused and the increase in collection of wild material as compared to that of earlier years was highlighted. The information on germplasm collected in different crop groups was presented, comprising 9,354 accessions including land races and wild relatives.

- Germplasm Exchange: Introduced 92,519 samples comprising 18,165 accessions of germplasm (20,115 samples), 9304 accessions of trials (72,381 samples) and 23 transgenic material. The export of germplasm comprised 413 accessions (444 samples) from headquarters and 8430 (11,629 samples) from regional station Hyderabad, mainly of ICRISAT material. Compilation of information on trait specific and need based introductions helped in the procurement of 619 exotic accessions.

Eight issues of Plant Germplasm Reporter (PGR) containing information upto December, 2003 were published.

- Plant Quarantine: Quarantine processing of germplasm under exchange resulted in the detection of pest infestation/ infection/ contamination in 1,697 samples. Of these, 1,694 samples were salvaged using various physico-chemical techniques. Supportive research led to the preparation of check-list of pests of quarantine significance of cereals and studies on use of Electron Beam (EB) as an alternative to methyl bromide were carried out.

- Germplasm Evaluation: A total of 26,183 accessions were characterized and evaluated and 5,705 accessions regenerated. Biochemical evaluation of 2,833 accessions and phyto-chemical evaluation of 212 accessions resulted in the identification of promising accessions. Germplasm field days were organized for several crops both at Headquarters and Regional Stations. Fourty-four crop based Electronic catalogues were brought out and distributed. Reports on germplasm evaluation for K*harif* 2002, *Rabi* 2002-03 and horticultural crops 2002-03 were brought out. Computerization and editing was completed for passport data on 25,000 accessions.

- Germplasm Conservation: The present status of material conserved in long term includes-ex-situ conservation 2, 67,417 accessions, cryopreservation-5,373 accessions and *in vitro* conservation -1,455 accessions and released varieties- 456. Fifty-six accessions of germplasm have been registered. Research aspects on conservation included studies on effect of relative humidity, ultra-desiccation, dormancy breaking, cryopreservation protocols, seed storage behaviour of cryopreserved material and alternative conservation methods for highly recalcitrant seed species.

- NRC on DNAFP: Completed DNA finger printing of 695 accessions belonging to different crop groups. Twenty three transgenic samples tested for terminator gene, protocols standardized for detection of genes and multiplex-PCR developed.

- Policy Planning: Helped in the execution of Global Plan of Action, National Biodiversity Strategy and Action Plan, Policy Issues Related to Plant Quarantine and Functional Committee on Plant Genetic Resources.

- Underutilised crops: A variety of Amaranth has been released with an average seed yield of 17.21 q/ ha. Apart from several trainings at various levels, grassroot level training was imparted to 910 participants under NATP Programme.

  New initiatives included a new system of germplasm evaluation in collaboration with NAGS/PC/PD. Multilocation evaluation of four major crops (rice, wheat, chickpea, pigeonpea) in collaboration with AICRP, joint evaluation with IARI, development of National Germplasm Nursery for multilocation and of trait-specific introductions; acquisition, evaluation and promoting utilization of core collections (ICARDA-barley, CIAT- French bean and ICRISAT- mandate crops); strengthening of germplasm management activities at NAG Sites and on germplasm collection and conservation of wild relatives.

II. Chairman's and Members Remarks

In his introductory remarks, Dr. E. A. Siddiq, appreciated the progress made in the introduction of germplasm of wild species and emphasized on its augmentation. He also stressed that efforts should continue: to introduce exotic perennial horticultural crops; all precautions be taken for preventing introduction of exotic pests along with introduced plant material; and characterization and accelerated evaluation of PGR collected under NATP. Appreciating the efforts made on documentation in the form of electronic catologues and information provided on PGR conserved. He emphasized that it should be made available to breeders. He further suggested that extra precaution be taken while studying transgenic material under field conditions; that centers of diversity for different crop species be identified for collection of wild alleles and that due importance be given for study of under utilized crops for their industrial value besides food value. Dr. B. L. Jalali in his remarks appreciated the achievements of the Bureau in terms of quality and quantity of work carried out. He suggested that the outcome of on-going efforts should reach various stakeholders. Dr. S. P. Tiwari, ADG (Seeds) emphasied on trait specific introductions, need for linkages in frontier areas of agricultural science (e.g. obtaining allele mining material of rice generated at IRRI) and knock out mutations for traits of interest. Also, he felt that NBPGR should review on-going project on underutilised crops for expansion of its scope and further utility. Realising that alien invasive species are becoming threat to various crop improvement programmes, he suggested specific studies be undertaken on this aspect. Mapping populations built by various groups in the country for tagging genes of economic significance be collected and conserved for use by others.

Dr. P. Pushpangadan emphasised the importance of passport data and digitalization of information for patenting. Dr. R. K. Arora complimented the work done and emphasied: for conservation of wild relatives of crop plants, documentation of the information considering the diversity, distribution, and their use. He also suggested identifying more number of crop species under the underutilised plants and to explore the scope of their industrial use. The NBPGR has attained the status of Centre of Excellence to impart training at regional and international level in conservation technology. PGR related information needs to be consolidated and efforts be made to make the same reach masses through publications in collaboration with IPGRI.

III. Confirmation of the Proceedings of the fifth meeting of RAC

The proceedings of 5th RAC meeting held on 2-3 June 2003 were unanimously adopted as there were no comments or suggestions received except that on recommendation No. 13 where Head, Plant Quarantine proposed rewording and was approved in principle.

IV. Presentation of Action taken report (ATR) of the last RAC

The action taken report (ATR) on the recommendations of 5th meeting of the RAC (Annexure-I, Page-13) held on 2-3 June, 2003 was presented by Dr. P. C. Agarwal, Member Secretary. The Chairman allowed detailed discussion on each recommendation and requested all the members to give their views. The Chairman was satisfied with the Action Taken Report and approved. The in-depth discussion that followed led to recommendations, which are listed elsewhere (page 10).

V. Presentation of achievements of different Divisions/ Units of NBPGR

The Heads of Divisions/Units, Project Director of NRC DNA Fingerprinting and OIC on Under-utilized crops made their presentations on the achievements made during the last one year (Annexure-II to XI).

VI. Confirmation of SRC recommendations

Dr. A K Singh, Secretary, SRC presented the recommendations of SRC held during 16-17, December, 2003. The recommendations on each activity were discussed at length. The report was approved by the RAC (Annexure-XII)

Item No V: Any other item with the permission of the Chair

With the permission of the Chair, Dr. P. C. Agarwal, Member Secretary presented following two new agenda items received

- NRC on DNA Fingerprinting be declared as ICAR Referral Centre for DNA fingerprinting of plant varieties and germplasm. The agenda was approved in principle. However, the Chairman emphasised that procedure/ guidelines be framed as per the ICAR rules for implementation.
- As regrds the proposal on on-farm conservation of rice in lower Subansiri and Lohit district of Arunachal Pradesh, after in-depth discussion, NBPGR was asked to explore the possibilities of locations for its on-farm conservation near Shillong in North-East.

  During discussions it was also decided that possibilities of on-farm conservation of small millets in Eastern Ghats also be explored.

The Recommendations of the 6th RAC

The following recommendations emerged during discussion on the following issues:

Plant Exploration and Germplasm Collection

1. There is a need to collect germplasm of:
   - Medicinal rices (Nivara type) from Kerala.
   - Mangosteen and Rambutan from Kerala
   - Remie from Assam
   - Perennial horticultural crops from different parts of the country

Germplasm Exchange

2. There is a need to introduce germplasm of:
   - Avocado from Sri Lanka
   - Durian from Malaysia
   - Remie (fibre crop) from China
   - Perennial horticultural crops from different countries

3. A list of the germplasm of crop species which should not be exported be prepared
4. A proforma be developed for getting feed back from indenters on the performance of trait specific exotic introductions made available to them.

Plant Quarantine

5. Experiments with the introduced rust, *Puccinia spegazzinii* being carried out at NBPGR be done with extra care since the rust is not yet reported from India. The Project Directorate on Biological Control (PDBC) may be advised to screen as many host species as possible against the rust.
6. Recognizing the importance of weeds it was stressed that more emphasis be given for their detection, identification and control in quarantine and necessary facilities be strengthened in terms of infrastructure and manpower.
7. The germplasm of legumes which is released after post-entry quarantine growing be monitored for at least one crop season at indenter's site to avoid any eventual escape of viral diseases. Therefore, the indenter may be requested to grow the material under the supervision of a Plant Pathologist working in the same organisation or the nearest Designated Inspection Authority (DIA) and information should be communicated to the Head, Plant Quarantine as soon as disease symptom(s) appear for necessary action.
8. Information being compiled on the plant pests while preparing check list should also include those that can be used as weapons of biological warfare.
9. A status paper on introduced pests of quarantine significance, their present status and management strategies may be prepared.
10. Information on pests of quarantine significance regularly intercepted but not yet reported in the country be published as leaflets.

Germplasm Evaluation

11. Chemical analysis of Indian mustard germplasm should include glycosinolate.
12. NBPGR may explore the possibility of identifying black and other wild kulthi (Horsegram) germplasm having the reported ingredient for dissolving kidney stone. For this, collaborations may be established with institutes like CDRI, Lucknow etc.
13. Trait specific germplasm introduced /collected should be checked for its performance under field conditions.
14. There is an urgent need to familiarise plant breeders about the DUS testing, and NBPGR may facilitate in organising training for the same.

Germplasm Conservation

15. A list of critically endangered wild relatives of crop species may be prepared in consultation with Dr. R. K. Arora to initiate efforts for their conservation.
16. Identity of wild accessions or crop species which are conserved in the Genebank with generic identity should be established through planting them in the relevant institutes.
17. Information regarding germplasm, particularly the accessions with traits of potential value be disseminated to enhance their use in breeding programmes.
18. Recognising the danger of unforeseen calamities, efforts should be made to identify additional sites for conservation of duplicate of the germplasm in other parts of the country. Conventional seed storage or any other cost effective method for such conservation be considered.

19. *In situ* (on-farm) conservation programmes may be taken up for developing suitable models for conservation of agro-biodiversity in traditional agro-ecosystem. NBPGR Regional Stations at Hyderabad and Shillong may initiate such programmes at selected target sites in their respective zones. (Action: Head Conservation & O/I Hyderabad and Shillong)
20. Efforts should be made for acquisition of germplasm of Indian origin from CGIAR institutes and other genebanks, particularly in the developed countries.

Tissue Culture & Cryopreservation

21. Efforts should be made to conserve all the released varieties of vegetatively propagated crops where *in vitro* conservation protocols are available as the material may disappear after some time.
22. Protocol may be developed for *in vitro* conservation of Aonla
23. Possibilities of cryopreservation of sugarcane buds should be explored.

PGR Policy Planning

24. Information on IPR management particularly related to the access to PGR should be collected for awareness generation among scientists.

DNA Fingerprinting

25. Unique rice germplasm collected by Shillong centre should be studied cytologically and if needed molecular techniques be used to establish its taxonomic identity.
26. NRC should strengthen research component in addition to routine DNA fingerprinting so that expertise of scientists is better utilized.
27. In pulses and some other crops, where STMS markers are not available these should be developed.
28. Extent of molecular diversity available in the germplasm as against in the released varieties be undertaken.

Under Utilized Crops

29. Considering the industrial value of under-utilised crops there is a need to reassess the crops included in the project, in consultation with Dr. R. K. Arora.
30. Keeping in view the diversity of crops, their industrial potential and emerging issues, ICAR may consider creating a National Research Centre on Under Utilised Crops.

General points:

31. A list of countries may be prepared where Agricultural Attaché needs to be appointed. (Action: Germplasm Exchange)