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**I. SPECIAL REPORTS****MINUTES OF THE WHEAT CROP GERMPLASM COMMITTEE****13 January, 2005.****San Diego, CA, USA.**

**Attendees:** Harold Bockelman, Gina Brown-Guedira (Vice-Chair), Kim Garland Campbell (Chair), David Marshall (Secretary), Dave Matthews, Jackie Rudd, Kay Simmons, Maarten Van Ginkel, and David Van Sanford.

Chairperson Kim Campbell convened the meeting at approximately 2:15 PM.

Harold Bockelman, Curator of the USDA–ARS National Small Grains Collection (NSGC), distributed information concerning the PI assignments during 2004. The PI number assignments for all wheat, rye, triticale, and *Aegilops* accessions were disseminated to the attendees. Within the collection, some difficulties in germination and viability have been encountered, which are being investigated. All seed previously produced in Arizona is being destroyed because of potential Karnal bunt contamination. A nursery in Parlier, CA, is now being used instead of Maricopa, AZ. The status of ancestral species of wheat was discussed. Recent collections, such as the TTCC (Texas–Turkey Cereal Collection) at Texas A&M University and recent collections from Tajikistan and Kazakhstan have not yet made in into the National Collection.

Maarten Van Ginkel presented an overview of the wheat genetic resources at CIMMYT. Following a recent inventory, efforts have been made to delete duplications, add GPS coördinates where possible, and move into a role of evaluation and application of the germ plasm and information present in the CIMMYT germ plasm bank. Recent additions to the CIMMYT collection include approximately 10,000 Mexican landrace selections, 2,300 Iranian landrace selections, and about 1,000 spring and 200 winter synthetic wheats. A motion was made, seconded, and passed for the USDA–ARS NSGC (Harold Bockelman) to obtain the 1,200 synthetics from CIMMYT. M. Van Ginkel also updated the Committee on the 2004 reorganization of CIMMYT.

Kay Simmons explained the National Plant Disease Recovery System, which is to provide the tools, infrastructure, and capability to mitigate plant disease outbreaks. Plant germ plasm plays a key role in the ability to recover from a devastating disease. A motion was made, seconded, and passed to reinstitute uniform disease screening nurseries in order to determine resistance and susceptibility levels in U.S. germ plasm.

D. Matthews presented the activities of GrainGenes for 2004. Included were potential interactions with other databases and the need for better interface for data queries and graphical displays of sequences.

The report on the status and future of wheat germ plasm was hoped to be completed by February 2005.

The meeting concluded at approximately 6:00 PM.

**MINUTES OF THE NATIONAL WHEAT IMPROVEMENT COMMITTEE (NWIC)  
MEETING.****14 January, 2005.****San Diego, CA, USA.*****Attendance.***

NWIC members: Allan Fritz, Brett Carver, Jim Peterson, Jackie Rudd, David Van Sanford, Jose Costa, Jim Anderson, Harold Bockelman, Dave Garvin, Joe Anderson, Xianming Chen, Kim Garland Campbell, Robert Graybosch, Kim Kidwell, and Kay Simmons (ad hoc).

Guests: Maarten Van Ginkel, Bikram Gill, Jakub Hadam, John Raupp, Forest Chumley, David Frey, Dave Hilferty, Mark Gage, Jorge Dubcovsky, Dave Matthews, Guihua Bai, Bob Bowden, Floyd Dowell, Gina Brown-Guedira, David Marshall, Ed Kaleikau, Kulvinder Gill, and Mark Sorrells.

**Approval of minutes.** Minutes from the December 2003 meeting, as published in the *Annual Wheat Newsletter*, were approved without revision.

***Annual Wheat Newsletter.***

Brett Carver and John Raupp – The current AWN account balance is approximately \$4,000. Annual contributions typically average \$1,800, and annual expenses (largely printing and mailing) equal approximately \$2,000/year. Publication and distribution of printed copies will continue as long as sufficient funds exist. A discussion was held as to whether future versions will include only a CD version, all on-line publications, etc. Conclusion was that the *status quo* will be maintained as long as sufficient funds are available. A request for receipt of hard copies will be circulated next year.

***USDA–ARS staffing update.***

Kay Simmons, USDA–ARS National Program Staff – Modest funding increases were obtained for the genotyping center at Raleigh, and Gina Brown-Guedira now has been appointed the director. The USDA Scab Research Initiative for FY05 will distribute \$ 5 million. Increased funding of \$ 200,000 was provided for wheat genomics research at Ithaca, NY. The plan will be to develop a new CRIS project to work on analytical tools for breeders of small grains in coöperation with GrainGenes.

***CSREES programs.***

Ed Kaleikau – A draft concept paper on a multi-state coördinating committee for plant breeding is being circulated amongst interested parties. The goal is to increase visibility of plant breeding to the public. Reported on progress toward establishment of Coordinated Agricultural Project (CAP) research projects for various crops. Wheat CAP group held a coördination meeting last year, headed by Jorge Dubcovsky of UC–Davis. A report is available on the GrainGenes web site: <http://wheat.pw.usda.gov/ggpapes/index.shtml>.

***Regional reports.***

**Eastern and southern soft wheat region.** Joe Anderson and others noted a joint Eastern/Southern meeting will be held in May 2005 at Bowling Green, Kentucky. Current vice-chair, Curtis Beazer, will become chair of the Eastern wheat workers. Jose Costa reported on the Southern region. Warm winter, mildew, and leaf rust are on the increase this winter already, along with BYDV. Only 10 % of the typical Arkansas wheat acreage was seeded.

**Spring wheat region.** Dave Garvin and Jim Anderson – ARS genotyping center at Fargo, ND, now is staffed and operating, with Shiaoman Chao as director.

**Western region.** Kim Kidwell – Western wheat workers meeting was held in Pullman, WA. The major topic of conversation being new races of stripe rust in North America, with at least 10 new ones having been discovered. Brian Beecher has joined the ARS group at Pullman to work on molecular approaches to improving Asian wheat product quality; the genotyping center at Pullman has been established and work is commencing. Oregon State has advertised to fill a cereals extension position.

**Winter wheat region.** Brett Carver – Kansas State University Grain Science Department has had several changes. Bob Bennett has moved to The International Grains Program, and Virgil Smail has been appointed Department Chair. Tim Herrman left an extension position at Kansas State to assume a similar position at Texas A&M. Yinghua Huang has joined the ARS group at Stillwater, OK, and will work on insect resistance in wheat, barley, and sorghum. ARS also has added a heat-stress scientist, Zoran Ristic, at Manhattan, KS. Jeff Edwards has assumed a wheat extension position at Oklahoma State University. The annual wheat breeders field tour, will be held 19 May at Lahoma, OK. Preharvest sprouting was a major problem in 2004 and acreage seeded to white wheat has declined.

### ***Wheat Crop Germplasm Committee.***

Kim Garland Campbell presented a summary of CGC meeting. ARS will be adding > 1,000 synthetics from CIMMYT to the National Small Grains Collection. It was recommended the wheat community should be proactive in getting international efforts in stripe rust screening. The CGC needs five or six new members and will meeting with NWIC again next year.

### ***NWIC bylaws.***

A decision was made to update the NWIC bylaws. A draft version will be written and circulated for approval.

### ***National Association of Wheat Growers update.***

Dave Hilferty, research committee, thanked the NWIC for a working relationship with NAWG. A priority list of projects recommended by NAWG for increased funding was presented and included:

- i. Karnal bunt,
- ii. the Wheat Genome Program – NAWG believes wheat should be the next crop genome sequenced,
- iii. the ARS Wheat Quality Laboratories,
- iv. the ARS Genotyping Laboratories.
- v. the National Stripe Rust Initiative,
- vi. increased funding for the Cereal Disease Laboratory,
- vii. GrainGenes, and
- viii. preharvest sprouting research

Mark Gage, NAWG chair, discussed the ‘Road Forward in Wheat (RE biotech)’, a document detailing the current state of affairs in wheat biotech and NAWG’s position. NAWG has decided the growers need to assist in the development of a market for biotech wheat. He described the plan NAWG has for the establishment of international and national markets for biotech wheat. NAWG passed up one opportunity (Roundup resistance) and U.S. wheat growers might not want to pass on future technologies. Much and sundry discussion commenced.

**New uses of wheat.** NAWG feels we should be keenly aware of additional opportunities for new uses of wheat. Need to move items from research side to commercialization. Feels this and biotech issue are the two key items in keeping wheat producers competitive.

Kim Campbell motioned NWIC appoint a subcommittee to draft a statement from NWIC regarding the ‘Road Forward on Wheat Biotech’. Subcommittee would consist of Jim Peterson (chair), Jose Costa, and Dave Garvin. Allan Fritz seconded. Motion passed. None opposed.

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***Wheat Workers Code of Ethics revision.***

Allan Fritz noted that the revision has yet to be completed. Emphasis was placed on the fact that every employer has different rules and obtaining a consensus in this day and age will be difficult. It was noted once material goes into the USDA National Small Grains Collection, it is freely available for distribution without MTAs. Wheat workers were encouraged to deposit materials in the collection so they can be made available to the world's wheat research community.

***Crop Science registration of restricted materials.***

Crop Science Society has a new policy that allows registration of materials with restricted release requirements. See the web page of the Crop Science Society of America for details.

***CIMMYT update.***

Maarten Van Ginkel noted new objectives at CIMMYT will be to increase efforts in South Asia, maintain in Africa, and reduce in Latin America. Six broad multidisciplinary programs will include

- i. Genetic Resources Program;
- ii. African Livelihood Program, primarily maize;
- iii. Tropical Ecosystems Program;
- iv. Rain-fed Wheat Systems;
- v. Intensive Agricultural Systems; and
- vi. Knowledge and Impact Program.

Most of the CIMMYT offices now are in Asia or Africa. CIMMYT is planning on contributing 1000+ synthetic wheats to the USDA-ARS NSGC for deposit and maintenance. Stem rust is now a major problem in Africa, especially in Kenya. Wide crosses will continue. CIMMYT, however, no longer has a full-time position working on Karnal bunt. Appreciation was expressed by the NWIC to Maarten van Ginkel for all of his contributions to international wheat research. NWIC also voiced concern over the de-emphasis of wheat breeding at CIMMYT. A letter from NWIC will be sent to AID and other funding institutions expressing the concern of the NWIC over the decline of funding for breeding and prebreeding at CIMMYT.

CIMMYT trip. Jim Peterson and Allan Fritz are coordinating a visit to CIMMYT by U.S. wheat breeders to CIMMYT facilities in Mexico. The visit will occur in early April 2005.

***Stem rust issues.***

Allan Fritz – new races seem to be showing up in Africa. Discussion followed regarding possibility for sending regional nursery materials to Kenya perhaps to be screened for stem and stripe rust. Kim Campbell and Allan Fritz will work together to see if we can make arrangements for coordinating forwarding of materials.

**Barberry quarantine.** Rollie Sears via Dave Van Sanford – USDA-APHIS now requires inspections of ornamental shrub nurseries, but no longer funds them. Some nursery owners find this task odious, but larger nurseries are supportive of it as it allows export to Canada. More on this issue should be forthcoming.

***CAP grant proposal.***

Jorge Dubcovsky reported on barley and soybean CAP programs. The wheat group attempting to secure a CSREES CAP grant is an expanded group 'From Genomics to Wheat Field' project. The new proposal will incorporate 18 breeding programs and the four regional genotyping centers.

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***USDA–ARS Engineering Research Unit.***

Allan Fritz and Floyd Dowell detailed the status of the USDA–ARS Engineering Research Unit at Manhattan, KS. The unit has lost half of their scientists in the past 8 years, and increased funding is necessary to maintain this group as a viable entity.

***IGROW project update.***

Bikram Gill described the white paper on the IGROW (International Genome Research on Wheat) to be presented at the 2005 Plant and Animal Genome Conference detailing progress to date. A meeting workshop was held in 2003 (text available at: <http://www.genetics.org/cgi/content/full/168/2/1087>) and will be followed by a pilot phase, assessment phase, and then scale-up if warranted. The goal is to establish a project for the sequencing of the wheat genome. The NWIC is supportive of this effort. An additional report from IGROW can be found on pages 15-17.

***USDA–ARS Genotyping Labs.***

Gina Brown-Guedira – Raleigh, NC, lab now is established with a mandate to work on wheat, maize, oats, and barley. Gui Hua Bai – Manhattan, KS, lab is up and running and has established research projects on mapping mildew and rust resistance genes and AI tolerance. New targets will include preharvest sprouting, continued work on AI tolerance, QTL for scab resistance from Korea, dwarfing genes, waxy genes, HMW-glutenin genes, and RWA resistance. Kim Campbell – Pullman, WA, lab received modest (less than required) funding, but has hired a postdoctoral associate and part-time technician to initiate work. Fargo, ND lab, under the direction of Shiaoan Chao, is fully funded and well equipped. They are in the process of completing staffing and will take lead in display of data and data analysis procedures.

***GrainGenes***

Olin Anderson described the liaison committee that has been formed to establish priorities, first of which was to migrate GrainGenes to a new database system. In April 2004, they rolled out GrainGenes II and made a formal announcement of the transfer of GrainGenes to a relational database system. A demonstration of the new system was presented at PAG meeting. Increasing importance is interaction with the Gramene project. Funding limits have resulted in staff reductions, which may require significant evaluation of activities and procedures. The NWIC supports GrainGenes and requests funding be maintained at current or enhance levels.

***Affymetrix chip.***

Joe Anderson reported the wheat chip was made available in December, 2004, and can be purchased. The wheat chip has 50,000+ probes, representing all 42 chromosomes. A rice gene chip also is available.

***National Wheat Genetics Meeting.***

Kulvinder Gill proposed an Annual National Wheat Genetics Meeting be established. We have one with goal of developing a common background and platform for wheat. Kulvinder Gill, Kim Kidwell, Gina Brown-Guedira, and Joe Anderson will form a subcommittee to explore possible meeting time and location.

***International Agriculture in Central Asia & the Caucasus.***

Kim Campbell described the current project coordinated by Washington State University via a special grant from CSREES. Currently funded projects include work at Oregon State, Washington State, and South Dakota State University. The NWIC is supportive for this project and recommends funding be continued.

***Wheat descriptor information.***

Harold Bockelman described circulation of a questionnaire seeking information on optimal descriptors for wheat germplasm in the collection. Discussion tabled until summary report, prepared by Carl Griffey, is circulated. Item will be discussed again at 2006 NWIC meeting.

***Ongoing initiatives – Karnal bunt Initiative.***

Forrest Chumley – U.S. government has set a target to have Karnal bunt deregulated by 2007. Outlook still is not promising. A minor disease of wheat continues to erode U.S. export markets. An update was presented on research progress of the program to date. Funding has been via a special grant through ARS. NWIC support has been key to maintenance of current funding levels. The initiative needs increased emphasis on genetics and breeding as the best approach will be to have resistant or immune cultivars. If we can develop Karnal bunt-resistant cultivars, deregulation is more likely.

***Stripe Rust Initiative.***

Current initiative plans to allocate funds to ARS, with ARS to distribute them, half within, half to state programs, with land-grant (state) portion distributed on a competitive basis. Allan Fritz will serve as NWIC representative to evaluate the program. Current version of stripe rust initiative will be used as a document to solicit increased funding.

***NWIC ballot on research efforts targeted for additional national funding.***

The NWIC supports (in order of decreasing priority) increased funding for the following research objectives:

- a. Stripe rust initiative,
- b. USDA–ARS Wheat Genotyping Centers,
- c. USDA–ARS Wheat Quality Laboratories, and
- d. the Karnal bunt initiative.

***Announcements.***

**2006 NWIC and CGC meetings.** A motion was passed to meet in San Diego, CA, in January 2006 in conjunction with Plant and Animal Genome Conference. Alternative time and site of December in Milwaukee received not all that many votes.

**Election of new NWIC chair.** Several candidates were nominated. A motion was passed to conduct a primary election, with the top two vote recipients being advanced to the final ballot.

**Resolutions and letters.** Brett Carver will draft resolutions and letters from the NWIC to appropriate parties.

The 2005 NWIC meeting was the final meeting chaired by David Van Sanford, University of Kentucky. On behalf of the U.S. and world wheat improvement community, the NWIC thanks Dave for his efforts.

*Post meeting note: subsequent to the 2005 NWIC meeting, an E-mail election for the incoming chair was held. C. James Peterson, Oregon State University, was elected chair, and will commence a 3-year term in 2005. Congratulations to Dr. Peterson, and gratitude is herein expressed to all candidates for their willingness to serve.*

Prepared by R.A. Graybosch, Secretary, National Wheat Improvement Committee, March, 2005.

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July 2005.*

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**WHEAT WORKER'S CODE OF ETHICS**

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This seed is being distributed in accordance with the 'Wheat Workers' Code of Ethics for Distribution of Germ Plasm', developed and adopted by the National Wheat Improvement Committee on 5 November, 1994. Acceptance of this seed constitutes agreement.

1. The originating breeder, institution, or company has certain rights to the material. These rights are not waived with the distribution of seeds or plant material but remain with the originator.
2. The recipient of unreleased seeds or plant material shall make no secondary distributions of the germ plasm without the permission of the owner/breeder.
3. The owner/breeder in distributing seeds or other propagating material grants permission for its use in tests under the recipient's control or as a parent for making crosses from which selections will be made. Uses for which written approval of the owner/breeder is required include:
  - (a) Testing in regional or international nurseries;
  - (b) Increase and release as a cultivar;
  - (c) Reselection from within the stock;
  - (d) Use as a parent of a commercial F1 hybrid, synthetic, or multiline cultivar;
  - (e) Use as a recurrent parent in backcrossing;
  - (f) Mutation breeding;
  - (g) Selection of somaclonal variants; or
  - (h) Use as a recipient parent for asexual gene transfer, including gene transfer using molecular genetic techniques.
4. Plant materials of this nature entered in crop cultivar trials shall not be used for seed increase. Reasonable precautions to ensure retention or recovery of plant materials at harvest shall be taken.

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## II. ANNOUNCEMENTS & PUBLICATIONS

### *Wheat Fingerprinting Database.*

CIMMYT is pleased to announce the release of the Wheat Fingerprinting Database, a Microsoft Access™ Database containing molecular-marker characterization data from wheat germ plasm. This germ plasm includes CIMMYT cultivars, breeding lines, and landraces. A simple user's manual is included as an additional Microsoft WORD™ file. Both files are downloadable from the CIMMYT website at <http://www.cimmyt.org/english/wps/publs/Catalogdb/index.cfm>. If your internet connection does not support downloading large files, you may obtain a free CD-ROM version from CIMMYT by contacting Liliana Villaseñor ([l.villasenor@cgiar.org](mailto:l.villasenor@cgiar.org)). Microsoft Access must already be installed on your computer in order to open and run the database.

The database was constructed around linked tables containing information on the studies that generated the data, the genotypes that were fingerprinted, the markers used in fingerprinting, and the marker data itself. Users may input or receive data in various formats through the use of forms provided with the program, and query functions allow subsets of data to be generated. Currently, all data are from individuals from heterogenous populations or pure lines, but a second table that handles population data (with multiple alleles and allele frequencies) is available and marker data will be available in this table in the near future. The CIMMYT Wheat Fingerprinting Database currently holds 32,518 data points, which are all SSR marker loci scored in five separate studies, which analyzed between 40 and 240 individuals or pure lines; marker data for 494 genotypes total are currently available. Both the functionalities (form tools and queries) and the data are expected to increase in the future, and the database on the CIMMYT website will be updated periodically.

This data is freely available without restrictions, however, please use the citation below when referring to the database in published works and posters. Comments and questions about the database and its contents may be referred to Marilyn Warburton ([mwarburton@cgiar.org](mailto:mwarburton@cgiar.org)). We are particularly interested in receiving feedback about the usefulness of the data and how it is being utilized.

**Correct citation.** Warburton M, Norgaard J, Lopez C, and Alarcon JC. 2004. CIMMYT Molecular Characterization Data for Wheat (CD-ROM). Mexico D.F.: CIMMYT.

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***Principles of Soil and Plant Water Relations***

by M.B. Kirkham, Kansas State University. Imprint: Academic Press. 2005. xvii + 500 pages. Hardbound. ISBN: 0-12-409751-0. \$79.95; £47.50.

*Principles of Soil and Plant Water Relations* combines biology and physics to show how water moves through the soil-plant-atmosphere continuum. Intended for graduate students in plant and soil science programs, this book also serves as a useful reference for agronomists, agricultural engineers, horticulturists, and plant ecologists. The book has 27 chapters organized to follow the movement of water through the soil-plant-atmosphere continuum. In addition, instrumentation and methods used to measure the status of water in the soil and plants are given. Each chapter ends with biographies of the scientists whose principles are discussed in that chapter. The chapters are as follows:

1. Introduction (Why study soil-plant-water relations; growth curves)
  2. Definition of Physical Units and the International System
  3. Structure and Properties of Water
  4. Tensiometers
  5. Soil-Water Terminology and Applications
  6. Static Water in Soil
  7. Water Movement in Saturated Soil
  8. Field Capacity, Wilting Point, Available Water, and the Non-Limiting Water Range
  9. Penetrometer Measurements
  10. Measurement of Oxygen Diffusion Rate
  11. Infiltration
  12. Pore Volume
  13. Time Domain Reflectometry to Measure Volumetric Soil Water Content
  14. Root Anatomy and Poiseuille's Law for Water Flow in Roots
  15. Gardner's Equation for Water Movement to Plant Roots
  16. Measurement of Water Potential with Thermocouple Psychrometers
  17. Measurement of Water Potential with Pressure Chambers
  18. Stem Anatomy and Measurements of Osmotic Potential and Turgor Potential Using Pressure-Volume Curves
  19. The Ascent of Water in Plants
  20. Electrical Analogues for Water Movement through the Soil-Plant-Atmosphere Continuum
  21. Leaf Anatomy and Leaf Elasticity
  22. Stomata and Measurement of Stomatal Resistance
  23. Solar Radiation, Black Bodies, Heat Budget, and Radiation Balance
  24. Measurement of Canopy Temperature with Infrared Thermometers
  25. Stress-Degree-Day Concept and Crop-Water-Stress Index
  26. Potential Evapotranspiration
  27. Water and Yield
- Index

Readers of the *Annual Wheat Newsletter* will be especially interested in the following chapters. In Chapter 14, wheat roots are used to demonstrate Poiseuille's law for water flow through roots. Evapotranspiration of wheat is considered in Chapter 25. Stomata of wheat are discussed in Chapter 22. The stress-degree-day concept is applied to wheat in Chapter 25. The relation between water and yield of wheat is shown in Chapter 27. A further description of the book and reviews of it are given on the book's Web page: [http://www.elsevier.com/wps/find/bookdescription.cws\\_home/703882/description](http://www.elsevier.com/wps/find/bookdescription.cws_home/703882/description). Alternatively, one can go to <http://books.elsevier.com> and follow the instructions. The book is listed under "Agricultural and Biological Sciences." Under "Author," type in Kirkham (last name only).

For customers in the Americas (North, South, Central), the book can be ordered from the following address: Elsevier Customer Service, 11830 Westline Industrial Drive, St. Louis, MO 63146 USA, 1-800-545-2522 or 1-314-579-3300 (TEL); 1-800-535-9935 or 1-314-523-5940 (FAX); E-mail: [usbkinfo@elsevier.com](mailto:usbkinfo@elsevier.com)

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**Update on IGROW (International Genome Research On Wheat).**

Bikram S. Gill, the Wheat Genetics Resource Center, Plant Pathology Department, Kansas State University, Manhattan, KS 66506-5502, USA.

I introduced IGROW in the 2002 *Annual Wheat Newsletter* (48:14-15). I shall begin by reiterating the vision of IGROW, which is to

- create a knowledge base on the genetics, genomics and biology of wheat plant,
- sustain wheat genetic and genomic infrastructure and resources, and
- serve as a platform for all wheat stakeholders.

Our immediate, urgent goal is to generate a global physical map and a draft sequence of the gene-rich regions of the wheat genome. Many people on behalf of IGROW have been very active in support of this mandate. I would like to update the activities of IGROW since mid-summer of 2004.

Several important milestones were reached during this time interval. IGROW held its first ever public workshop on 15 January, 2005, in the Sunrise Room, Town & Country Convention Center, San Diego, CA, as a part of the Plant and Animal Genome XIII Conference held annually and attended by thousands of scientists from several dozen countries (The IGROW workshop abstracts can be viewed at the PAG website: <http://www.intl-pag.org/13/>). The wheat genetics community has to be congratulated for their enthusiasm, because the workshop room was overflowing. I presented the white paper on IGROW, reiterating the deliberations and decisions presented in the *Genetics* article (see Gill et al. 2004). Jaroslav Dolezel, Boulos Chalhouh, and Catherine Feuillet made a joint presentation entitled 'Targeted approaches to decipher the complex genome of wheat'. They have made significant progress in making a BAC-contig physical map of 3B using a flow-sorted library (Safer et al. 2004). Jan Dvorak updated progress of the physical map of *Ae. tauschii*, which can be reviewed at the project website: <http://wheat.pw.usda.gov/PhysicalMapping>. Daniel Peterson reviewed 'Gene-enrichment strategies for analysis of the wheat gene space', including recent research in wheat (Didier et al. In press). Yasunari Ogihara reviewed the 'Wheat transcriptome project in Japan'. Robin Buell reviewed The Institute for Genomics Research (TIGR) efforts on the 'Development of a bioinformatics pipeline for wheat genome annotation'. Readers are encouraged to visit the TIGR wheat website: <http://www.tigr.org/tdb/e2k1/tae1/>.

The public workshop was followed by an informal workshop in the evening. Following updates of the genome projects from different countries, most of the discussion was devoted to the mission statement and the organizational aspects of an international wheat genome sequencing project. In the ensuing months and many discussions later, an International Wheat Genome Sequencing Consortium (IWGSC or WGSC) was organized and formally launched at the ITMI workshop meeting in Bozeman, MT (28 May–1 June, 2005). The WGSC website (<http://www.wheatgenome.org>), has all relevant documents and information. Membership is open to anyone interested in wheat genome sequencing, and application forms can be downloaded from the website.

So we have ITMI and IGROW, and now WGSC? Confused, yes, and you are not alone, but I will make an attempt to rationalize. ITMI provides an umbrella for all Triticeae research, and IGROW is an umbrella for all genetics and genome research on wheat (check out the ten areas of emphasis of IGROW at website: [http://www.ksu.edu/igrow/IGROW\\_history.html](http://www.ksu.edu/igrow/IGROW_history.html)). The WGSC will provide leadership specifically for securing funding and coordination of research for the physical mapping and sequencing of the wheat genome. This is going to be a very challenging endeavor, and we all need to be working as a team to make it a success. There is no doubt in my mind that such a project will have huge impact on wheat breeding and end-use research so that the wheat plant we all love continues to play a preëminent role in human nutrition and caloric intake as well as a model for polyploidy research.

Of course, it is always a pleasure to update the awarding of new and ongoing wheat genomics projects to the wheat genetics community. Some good news from the NSF–Crop Genome Research Program as one wheat genomics grant was awarded to J.L. Bennetzen and K.M. Devos (University of Georgia, Athens), and P.J. SanMiguel (Purdue University, W. Lafayette, IN) for sample sequencing of the Chinese Spring wheat genome. Mark Sorrells and colleagues won an award from the USDA–NRI for 'Mapping expression profiles of genes controlling seed dormancy in wheat' using microarrays. However, this level of funding is totally inadequate considering the size of the wheat genetics community, and we need to work hard at garnering a bigger piece of the pie, both from NSF and USDA–NRI.

Some exciting news was received in terms of publications reporting on new genomic resources for the wheat community. The results of a recently concluded, 4-year project funded by the NSF involving 10 universities on the 'Structure and function of the expressed portion of the wheat genomes' (lead PI: Cal Qualset, University of California, Davis) (project website: [http://wheat.pw.usda.gov/cgi-bin/westsq1/map\\_locus.cgi](http://wheat.pw.usda.gov/cgi-bin/westsq1/map_locus.cgi)) were published in a series of papers in special volume of *Genetics* (October 2004). Wheat-rice syntenic maps (TIGR website) are now part of an essential toolkit of every wheat geneticist. Li et al. (2004) generated 2.9 Mb of genomic shotgun sequence and 556 kb of methyl-filtered sequence from *Ae. tauschii*. Lamoureux et al. (2005) produced 1.4 Mb Cot-filtered genomic sequence of Chinese Spring. So far, over 4 Mb of contiguous wheat sequences consisting of 10–20 kb cosmids to over 200 kb BACs have been reported in the NCBI database. For 2004–05, 2.5 Mb wheat sequences were generated mainly from the laboratories of Justin Faris (five BACs, 0.786 Mb surrounding the tan spot toxin gene, unpublished), Olin Anderson (0.592 Mb surrounding the *Glu* locus, see Kong et al. 2004; Gu et al. 2004), Beat Keller (0.341 Mb from the *Lr10* gene region, see Isidore et al. 2005), Peter Langridge (0.275 Mb from the *Ph2* gene region, unpublished), Boulos Chalhoub (0.274 Mb from the *Ha* locus, see Chantret et al. 2005), and Jorge Dubcovsky (0.235 Mb from the *Ha* and *VRN2* gene regions, see Chantret et al. 2004 and Yan et al. 2004, respectively). The application of TILLING, another useful reverse genetic tool for wheat genome analysis was reported by Slade et al. (2005). This method provides a targeted approach for rapid screening of mutants for a candidate gene. Scofield et al. (In press) reported a VIGS technique to advance functional genomics research in wheat.

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