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Hans-Joachim Braun and Tom Payne.

During the past few years a number of changes have occurred within CIMMYT and CIMMYT's wheat research group. The challenges wheat research faces today are as daunting as ever, with high commodity prices (approaching US$12.00/bu), rapid changes and migrations in wheat pathogen virulences, and customers' increasing awareness of our intertwined relationship between food, agriculture and climate.

CIMMYT Director General.

Dr. Thomas Lumpkin, a well respected scientist and science administrator, will succeed Dr. Masa Iwanaga as the new Director General of CIMMYT. Dr. Lumpkin, a U.S. national, is currently Director General of AVRDC, the World Vegetable Center, headquartered in Taiwan. Under his leadership, the center has expanded significantly, reaching beyond its roots in Asia to apply its expertise and strengthen its presence in parts of the world where vegetables could make a significant difference in the lives of the rural poor.

Dr. Lumpkin will assume his post at CIMMYT on 15 March, 2008. Prior to his appointment at the World Vegetable Center, he chaired the Department of Crop and Soil Sciences at Washington State University. Dr. Lumpkin holds a BSc in Agronomy from Washington State University and MSc and PhD degrees in Agronomy from the University of Hawaii. He is widely known in agriculture and development circles for his books and publications on global horticultural needs and approaches to poverty alleviation in the developing world.

International wheat nurseries.

CIMMYT annually distributes nearly 6 t of seed of thousands of experimental lines. Our international nurseries are targeted to specific wheat mega-environments and grain-color types. In addition, CIMMYT holds in-trust approximately 144,000 wheat, triticale, and barley accessions, which are freely available. All germ plasm is distributed under the standard material transfer agreement (SMTA). Further information can be obtained at:

CIMMYT International Nurseries: http://www.cimmyt.org/english/wps/obtain_seed/sidu.htm.

CIMMYT International Wheat Nursery data: http://www.cimmyt.org/ wpgd/index.htm.

CIMMYT International Nursery field books: http://www.cimmyt.org/ iwin/index.htm.

Standard Material Transfer Agreement (SMTA), for seed and germ plasm distribution: http://www.cimmyt.org/ english/wps/obtain_seed/smtainformation-en.htm.

Frequently asked questions (FAQ) regarding the SMTA: http://www.cimmyt.org/english/wps/obtain_seed/smtafaq-en.htm.

Spot blotch screening in Mexico.

Etienne Duveiller.

Although a lot of progress has been achieved toward understanding the epidemiology and factors modulating the expression of field resistance of wheat to spot blotch caused by *C. sativus*, sources of genetic resistance to this disease remain limited. The Eastern Gangetic Plains Screening and Yield Trial nurseries (EGPSN and EGPYT) have contributed to the dissemination of high-yielding, heat stress-tolerant materials harboring spot blotch resistance with local adaptation to the warmer areas in the Indian Subcontinent. However, when sources of genetic resistance and genotypes cited during the last 10 years to harbor genetic resistance are analyzed, most materials appear to result largely from the direct use of resistant sources identified through CIMMYT screening in the lowlands of Mexico. Thus, if the base of genetic resistance has to be expanded including through the use of new interspecific crosses or synthetic derivatives, field screening against spot blotch in Mexico should not be overlooked. This was confirmed during a visit to Agua Fria, a CIMMYT Maize station at the limit of Puebla and Veracruz, where several hundreds advanced lines were tested. Typical spot blotch symptoms could be observed, and scoring was easily conducted in second half of February. The disease, however, must be induced by spreading in the rows infected sorghum grains around the first two weeks of January. The wheat pathology laboratory produced about 70 kg of a grain-based sorghum inoculum that had been incubated for approximately 6 weeks at room temperature after being inoculated with three local *C. sativus* strains. A list of resistant sources to spot blotch cited or identified in the last 10 years is included.

Septoria tritici blotch research.

Etienne Duveiller.

Field Testing of 30 genotypes against ten *M. graminicola* isolates. For the second year, 30 bread wheat genotypes were tested in Toluca against ten strains of *M. graminicola* originating from the state of Mexico. These strains had previously been characterized (2006) in the laboratory for their virulence against a set of differential lines and genotypes using a detached leaf technique. Preliminary results confirmed that excellent sources of resistance to Septoria tritici blotch are available in CIMMYT materials. Resistance in the most resistant genotypes does not seem to be isolate-specific, but a more comprehensive analysis with all stains needs to be conducted on 2006 and 2007 results. Several genotypes such as Tinamou, 'Milan/S87230//Babax', and 'Milan/OTUS//Attila/3*BCN' are moderately resistant to strain 26 and 32 but significantly more susceptible to the more aggressive strain 86. In contrast, 'KAUZ/Pastor//PBW343' and 'PBW343*2/Kukuna' seem moderately susceptible to the three strains.

In the *M. graminicola*–wheat pathosystem, we recognize that a high diversity exists among isolates within a field as a result of sexual recombination. There might be not less variability within a field than between distant locations. During a visit at ETH, Zurich, in January 2007, we discussed earlier results related to isolates sent from Patzcuaro, Mexico, for a population diversity research. Against expectations, these isolates were found to be clonal, which suggests that they might originate form a single source. Because the Patzcuaro fields had not been inoculated, one hypothesis could be the absence of sexual recombination, which would imply that both mating types were not found. A series of strains isolated from farmers' fields and used at CIMMYT were sent to Belgium, UCL, Unit of Phytopathology, to determine the mating type with PCR. Results showed that both mating types were found in equal amount, suggesting that sexual recombination does occur and that isolate diversity can be found as in other parts of the world. However, the situation in Mexico differs for instance from Tunisia where the *S. tritici* disease severity observed is much more severe in durum wheat than bread wheat. Samples collected on durum and bread wheat in Tunisia were sent to Wageningen for isolation and characterization.

Screening for tan spot resistance in El Batan and Oaxaca. Tan spot, caused by *P. tritici-repentis*, is considered to be the most important foliar wheat disease associated with zero tillage because the fungus can over-wintering on stubble. Screening for resistance in the field is cumbersome and difficult: the production of inoculum in sufficient quantity is complicate and slow because conidia are important for the disease development but are only induced under specific light requirements. Also, tan spot development in El Batan is relatively slow and symptoms are difficult to assess because plants are submitted to earlier attacks by other foliar pathogens such as rusts. In Mexico, two races (1 and 2) at least (based on host specific toxins) are known to exist. In 2007, systematic field screening in pathology plots resumed at El Batan using race 1, the most commonly found race globally. A range of approximately 120 wheat entries known to show differences in resistance were field-tested from June to late September. The inoculum production protocol was revised and the rate of conidia production in the laboratory was dramatically improved. However, we confirmed the difficulty to establish the tan spot epidemics at El Batan; plots had to be inoculated about twice a week during a month, which required some 2,000 petri dishes of fungal culture. Because of slow disease progress in spite of having set-up the trial in an area under fine misting system, tan spot evaluation could not start before the end of Aug. when attacks of yellow and leaf rust had already killed various entries. Clear-cut differences for tan spot among various genotypes, including known differentials, were eventually observed and results were relatively encouraging. Some known resistant genotypes such as Milan, 'Milan/Sha-7', or 'Gisuz/Sabuf' appeared much more resistant than Ciano-79 or 'Irena/Kauz'. These observations were confirmed by results obtained in Oaxaca (Yanhuitlan) a location where CIMMYT used to screen efficiently for tan spot resistance under natural conditions until 1997 and where we resumed our collaboration with INIFAP pathologist L. Osorio in 2007. In Yanhuitlan, although tan spot severity was low, due probably to an area reduction in wheat grown in monoculture in the area, tan spot symptoms were typical and easier to recognize than in El Batan. In Oaxaca area, we collected leaf samples from farmer fields to enrich the *P. tritici-repentis* collection at CIMMYT with new isolates.

Fusarium head blight.

Etienne Duveiller.

CIMMYT started a breeding program for FHB resistance approximately 20 years ago. FHB of wheat is now recognized as a very important disease, which should be controlled in order to attain sustainable production of wheat crops in both developing and developed countries. For its role and contribution to FHB research, CIMMYT is considered a very suitable institute to organize a FHB network in partnership with national and international institutions throughout the world. The present research program aims to identify new FHB-resistance gene sources by screening germ plasm accessions maintained at CIMMYT and to use them in the development of resistant wheat lines employing the latest biotechnology approaches. Although the field screening of up to 9,500 wheat and barley materials under inoculation and a fine misting system consists in the core activity, attention is increasingly given to the detection of low toxin content in field resistant materials.

In 2007, for the second year we used our FHB-screening system at El Batan, which gives greater screening capabilities, accuracy, and precision. We use an automated, programmable misting system and precision CO_2 sprayers for liquid inoculum application. Over 9,000 plots were planted in El Batan, Mexico, under artificial inoculation and misting for FHB evaluation in 2007. The isolates are *F. graminearum* from El Batan for which DON chemotype had been confirmed and aggressiveness has been tested in the greenhouse on a resistant and susceptible checks. In the field, ten spikes were tagged at anthesis (wheat) or heading (barley) and spray inoculated. Wheat plots were rated at 31 days after the first spray inoculation. Careful notes were taken on a sample of ten spikes (number of spikelets infected and the total number of spikelets). For wheat, preliminary screening materials, FHB index (a disease statistic reflecting a combination of the severity and incidence of disease) ranged from <1% to 100%.

Identification of isolates for 2007 field screening season. To keep our pathogen isolate collection valid and fresh for the field inoculations for the 2007 FHB nursery, 13 isolates from various origins identified as *F. graminearum* according to PCR evaluation were screened for aggressiveness by single-floret inoculation of five different genotypes in the greenhouse in the spring of 2007. Spikes were inoculated by point inoculation using 10 μl or inoculum at 100,000 spores/ml. Following inoculation, spikes were misted in a misting chamber for approximately 2 days to ensure infection, after which they were returned to normal greenhouse benches for evaluation. Spikes were evaluated for visual symptoms of disease in the spikelets as well as the rachis at 7, 14, and 21 dpi.

The line HEILO, CMSS93Y02492S-2Y-010M-010Y-010M-10Y-1M-0Y-3SJ-0Y, was identified with similar levels of resistance to FHB as that of Sumai #3.

Research on toxins and DON evaluation in field selected wheat materials. We are placing a high priority on toxin evaluation of selected trials/entries from the FHB-screening nurseries. We realize that the correlation between field symptoms and DON assessment may not be strong since the toxin production depends on gene expression of the fungus and because the DON production itself might depend on the resistance level of the host. In other words, depending on the resistance mechanism, the level of stress caused to the pathogen may affect the DON production. The toxin content in grain depends on the Fusarium species involved, their ability to produce one or another toxin, and the environment and the level of scabby kernels. Also, a situation where grain samples are collected in an inoculated plot may largely differ from a field under natural infection. In principle, because *F. graminearum* has been used in field trials, DON is the major toxin of concern.

In 2006, we started to actively place a high priority on toxin evaluation of selected trials/entries from the FHB screening nurseries. The first approach was to use the RIDASCREEN® FAST DON ELISA kit and quantitative PCR (qPCR) to evaluate the amount of DON based on serology and on the amount of fungal DNA (TRI5 gene). Additional evaluation methods also are being used for examining the correlation between toxin evaluation using other possible methods such as the Fluoroquant method (in collaboration with colleagues in the Southern Cone, South America), or a new immunoassay under development at Ghent University, Belgium, and tested at CIMMYT in 2007. Other approaches to investigate these correlations included spike point inoculation in the greenhouse, fungal biomass accumulation and visually scabby kernels.

The 11th CIMMYT Scab Resistance Screening nursery. CIMMYT has regularly developed and distributed a Scab Resistant Screening Nursery (SRSN) over the past decade. These nurseries have consisted of the best scab resistant material identified through CIMMYT's FHB-screening trials and have been distributed to interested programs around the world upon request. The most recent nursery distributed was the 10th SRSN, which was made available in 2006. Since that time, CIMMYT's method for screening FHB has been modified for more effective identification of FHB resistant germ plasm. These changes have included modifications in the location of the screening nursery, isolates used for inoculation, inoculation technique, and misting technology. After two years of screening a range of materials using the modified methodologies, entries for the 11th SRSN have been identified. This nursery primarily includes the best FHB-resistant, advanced lines developed by the CIMMYT wheat breeding programs. The 11th SRSN will be available for distribution in 2008.

Selection of lines for the 11th scab resistant screening nursery (SRSN). ***El Batan field screening 2006 and 2007.*** In 2006 we made changes to our FHB-screening methods. Given the importance of these changes, we decided to have two years of screening under the new screening methods before selecting entries to distribute in the internationally distributed Scab Resistant Screening Nursery. Plants were planted in 1-m single replication or 1.5-m replicated double-row plots. At 50% anthesis, ten spikes in each plot were tagged. At anthesis and 2–3 days post anthesis, the plot was sprayed with 33 ml of *F. graminearum* conidia (100,000 spores/ml in 2006, 80,000 spores/ml in 2007). The programmed misting system was used to create wet/humid conditions conducive to disease throughout anthesis and grain fill. Thirty-one dpi, the ten marked spikes in each plot were scored for the total number of spikelets and the number of infected spikelets on each spike. These numbers were used to calculate the % incidence and % severity. From these data, the FHB Index was calculated (FHB Index = % Incidence x % Severity / 100).

Selections and post-harvest processing in 2006 and 2007. In 2006, over 3,700 entries were screened in 1-m, single replication plots for preliminary screening (though some of these had been screened once before in Toluca, Mexico), and nearly 300 were screened in 1.5-m replicated plots for possible inclusion in the SRSN. Those that performed very well for visual field symptoms, and for which we had an appropriate seed source for increasing in Mexicali Mexico (our Karnal Bunt free-site), were sent to Mexicali for increase in 2006–07 winter season.

FDK and ELISA from 2006 harvest. Lines that were selected according to visual field symptoms in 2006 were further processed for *Fusarium* damaged kernels (FDK) and contamination with DON via ELISA. FDK was examined from a 40-g sample of seed cleaned of chaff. These samples were quantified for DON used for ELISA using the RIDASCREEN ® FAST DON kit with the following modifications:

- For preliminary screening materials (single replication), a gravity divider was used to separate the original 40-g sample into two 20-g samples. One of these 2-0g samples was ground, from which a 2-g sample was taken.
- For advanced FHB-screening materials (replicated), the entire 40-g sample was ground, from which a 2-g sample was taken. The appropriate proportion of water was added to each 2-gram subsample and shaken. A 1-ml aliquot of the resulting liquid was centrifuged at 14,000 rpm for 15 minutes, from which 50 μl of the supernatant was used for ELISA.

2007 selection. In 2007, two 4-replicate, incomplete-block design trials were created, one from lines that had been selected from a single replication in 2006 (31 entries plus four checks), and one from lines that were selected from replicated trials in 2006 (38 entries plus four checks, four replications). These trials were evaluated for FHB using the same procedure outline above for 2006. Lines that again performed very well for visual symptoms in the field in 2007 were selected for inclusion in the 11th SRSN. Many of the lines are in elite backgrounds as selected by CIMMYT's bread wheat breeders. One resistant (Sumai 3) and two susceptible checks are included. Eleven lines with consistently high levels of resistance have been repeated from the 10th SRSN to ensure their distribution to FHB researchers. The 2006 FHB Index, DON, and FDK values shown are just for a general guide and must not be interpreted strictly, because these data are from multiple trials within 2006 (some replicated, others not), and more than one person was involved in taking notes (a single person/trial).

Facilitation of new international Fusarium nurseries. In March 2006, CIMMYT organized the 'CIMMYT Workshop on the Global Fusarium Initiative for International Collaboration' to provide a platform for international collaboration on Fusarium research projects. This workshop concluded and endorsed two new international spring wheat nurseries that were needed for better facilitation of international exchange and evaluation of Fusarium-relevant, spring wheat materials and the exchange of knowledge generated through the evaluation of these materials. These two nurseries include

1. the Fusarium Elite Spring Wheat Nursery (FESWN). The specific objective of this nursery is to enable contributors to know the performance of their entries across environments, and allow participants to identify useful sources of resistance in entries from other programs. The nursery will include two types of entries:
    - Elite FHB/FCR resistant spring wheat (registered or near-registered resistant cultivars) that have performed well in regional FHB/FCR nurseries.
    - Regional FHB/FCR resistant and susceptible reference/standard checks.
2. Fusarium Preliminary Spring Wheat Nursery (FPSWN). The purposes of this nursery include identification of new sources of resistance; examination of stability of QTL for FHB/FCR resistance; surveillance for new and/or problematic pathogen strains; and development of knowledge or solutions in regard to other issues such as negative correlations between resistance QTL and other traits. The nursery may include
    - Any materials which address the objectives listed above including Near Isogenic Lines (NILs) of FHB/FCR QTL; Parents of mapping populations;

The overall objective of these two nurseries is to make useful materials for FHB and Fusarium Crown Rot available throughout the world. CIMMYT is serving as the coordinator of these two nurseries. CIMMYT routinely develops internationally distributed nurseries. The first nurseries will be distributed in 2008.

Launching of Global Fusarium Initiative Website. The new website of the Global Fusarium Initiative (GFI) was launched in early 2007. The site includes a message board that offers possibilities to exchange actively new information between scientists. One of the first outcomes is the presentation of the full proceedings of the GFI workshop held at CIMMYT in Mexico in March 2006 and a calendar of important events related to FHB activities, including field screening, international nurseries, and research on mycotoxins. The website is located at http://www.globalfusarium.org

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Performance of advanced wheat lines that will form 30th Elite Selection Wheat Yield Trial (ESWYT) and 42nd International Bread Wheat Screening Nursery (IBWSN).

Ravi Singh and Julio Huerta.

A total of 1,540 new entries were tested for first-year, grain yield performance at Obregon during 2006–07 on raised beds. The season was good for the expression of yield potential with an average yield over 55 yield trials (Alpha-Lattice-Latinized design with three replications, two checks, and 28 entries in each trial) of 8.182 (ranging between 9.160–7.537) and 7.472 (ranging between 8.530–5.292) t/ha for the checks Roelfs 2007 and Waxwing, respectively. On average, Roelfs 2007 yielded 9.5% over Waxwing.

Progress was made in kernel weight, and a large portion of lines now has medium to large grain. For reference, the grain weight of Waxwing, Roelfs 2007, Kronstad, and Tarachi is 43.8, 47.2, 40.6, and 41.0 mg, respectively. Kernel weight was smaller than in the 2005–06 season. Small-grained (Kauz type) lines remain absent. The largest 1,000-kernel weight was 62.85 g for the line 'CNDO/R143//ENTE/MEXI_2/3/AE.SQ.(TAUS)/4/ Weaver/5/2*KAUZ/6/PRL/2*Pastor', which is derived from a cross involving synthetic wheat. Because the 'PRL*2/Pastor' parent had a 1,000-kernel weight of 50.7 g, the synthetic wheat must have contributed to a further increase in kernel weight.

Data for leaf rust (El Batan, 2 yrs, and Obregon,1 yr), yellow rust (Toluca, 2 yrs, and Ecuador, 1 yr), and stem rust (Kenya, 2 yrs) were obtained and used in selecting lines for further testing. *Septoria* and *Fusarium* data were also obtained and considered.

Quality analysis indicated that 15.4% of lines included in the second year yield trial during 2007–08 had excellent industrial bread-making quality characteristics, and another 23.9% would make good flat breads and chapatti; a major change in the last few years in irrigated bread wheat improvement materials. These lines are being tested for the second year during the Cd. Obregon 2007–08 season under five environments: raised-bed, full irrigation; flat (melga)-full irrigation; raised-bed reduced irrigation; raised-bed drip-based water stress; and raised-bed late sown.

Performance of advanced lines that formed 29th ESWYT and 41st IBWSN. The 29th ESWYT and 41st IBWSN were formed using two years of yield data from Obregon where 448 lines and checks (16 yield trials, 28 entries, and two checks, each trial with three replicates) were tested in Obregon 2006–07 under three environments: raised-bed four supplementary irrigations; flat (melga), four supplementary irrigations; and raised-bed, one supplementary irrigation. Compared to the check Roelfs F2007, 16.0%, 34.4%, 30.0%, and 20.5% lines displayed grain yield at 100% or greater in raised-bed, four supplemental irrigations; flat, four supplemental irrigations; raised-bed, one supplemental irrigation; and for the mean of the three environments, respectively. Correlation coefficients (r) for grain yields (expressed as % of Roelfs F2007) for 476 lines in raised-bed, four supplementary irrigations for two seasons (2005–06 and 2006–07); flat, four supplementary irrigations (2006–07), and raised-bed, one supplementary irrigation (2006–07) were calculated. Correlation coefficient (r) of about 0.4 under irrigated conditions is not too bad, however, there was practically no relationship between well-watered and reduced irrigation scenario. Despite this, noteworthy is that several lines maintained their performance irrespective of the planting method or irrigation regimes.

Performance of early maturing lines in northeastern India. One of the breeding strategies at CIMMYT in recent years has been to select early maturing wheats with increased yield potential to escape from late heat stress. Eight early maturing lines that have shown superior yield potential in Mexico were chosen to establish yield trials at experimental station of BHU, Varanasi, and eight farmers' fields together with two released varieties HUW234 and HUW468 and Baz, a line that performed well during 2005–06 in a similar trial. The two best lines showed an average yield advantage of 22 and 18% over the HUW234 check. All eight lines were statistically superior to HUW234 and HUW468 with 6–16% higher yields. 'Waxwing*2/Vivitsi' and 'Kiritait//HUW234+Lr34/Prinia' are resistant to Ug99 and are being evaluated and promoted during the 2007–08 crop season by Dr. A.K. Joshi.

Performance of entries in 2nd Elite Bread Wheat Yield Trial (EBWYT). The 2nd EBWYT was distributed to 28 sites in 11 countries (Mexico, India, Nepal, Pakistan, Iran, Afghanistan, Egypt, Turkey, Sudan, Syria, and Ethiopia) and data has been obtained from 25 sites. The trial is being grown in Ethiopia and Turkey at present. Seed multiplication in El Batan allowed us to disseminate and test these new materials two years earlier, especially considering the threat from Ug99 has increased. Fifteen entries were characterized to carry stem rust resistance based on two years of evaluations, including with the *Sr24* virulent variant. Resistance categories are R (15–20%), MR (30%), and MR–MS (40%) and were given based on two years of evaluation when susceptible lines were dead because of heavy high stem rust pressure. Resistance up to MR is considered adequate, but MR–MS lines also are expected to survive in areas where stem rust is not endemic causing epidemic to start late. Of note is gene *SrTmp*, which only gave an MR–MS level of resistance. For each country, resistant lines with superior yields over the check could be identified. Five entries on the average of 25 sites gave 6 to 10% higher yields over the check. At the individual country level, we see the yield advantage of new lines is much higher. For example, in India the best lines were 'Waxwing*2/Kiritati' (entry 521) and 'Babax/*Lr42*//Babax*2/3/Vivitsi' (entry 519) with yield advantages of 17 and 16%, respectively. Both of these lines are resistant to Ug99. Interestingly, even in the heat-stressed sites of Sudan, five entries had between 10–17% superior yields over the check. We succeeded in identifying lines that are not only resistant to all three rusts but also will increase productivity in each country by a significant margin of at least over 10%. Recuperation of data was 100%.

Grain yield performance of lines with *Gpc-B1* at Obregon 2006–07. A small project was initiated in 2002 to incorporate the *Gpc-B1* gene from ND643, a genetic stock from North Dakota, into selected CIMMYT wheats. We made 13 crosses and single-backcrosses with CIMMYT wheats and selection was carried out until the advanced lines with good agronomic features were developed. Marker analysis of 109 of these lines indicated that we succeeded in obtaining 55 lines from seven crosses that carry this gene. The seven genetic backgrounds are two different selections of Weebill1, 'PRL/2*Pastor', 'Attila/2*Pastor', and 'Seri/Rayon' and 'Seri 1B*2/3/KAUZ*2/BOW//KAUZ' and 'Seri 1B/KAUZ/HEVO/3/AMAD'. We failed to recover any line that had recovered the yield potential if it had the *Gpc-B1* gene. In contrast, some of the lines that inherited a gene for stem rust resistance from ND643 had recovered the yield potential; indicating that the early senescence associated with *Gpc-B1* may have negative effect on grain yield. New crosses have been made to see if this negative association can be overcome by manipulating the genetic background.

Shuttle breeding for stem rust resistance between Mexico and Kenya. About 1,000 seeds of 231 F_3 stem rust, 125 F_4 stem rust, and 28 F_5 stem rust populations (populations from crosses having at least one parent resistant to Ug99 race of stem rust) were also grown in two-row, 5-m plots/population in Kenya under high stem and yellow rust pressure during the 2006–07 off-season. A bulk selection was carried out after removing the tall plants from the populations. About 800 plump seeds were selected and grown again during the main season under high stem and yellow rust pressure and also sent to Mexico. Resistant plants with good agronomic features were selected in Kenya, and seed has been sent to Mexico for planting in Obregon most likely during the last week of November. However, a total of 203 F_4 and F_5 populations with plump grain sent earlier from one season of selection in Kenya were planted in Obregon during November 2007 for individual plant selections. We eventually will have parallel populations from the same crosses with no selection in Kenya in segregating generations, with one round of selection in Kenya, and with two rounds of selections in Kenya. These populations will allow us to determine the best strategy to obtain stem rust resistant lines that also have high yield potential. We have sent 406 new F_3 stem rust and 222 F_4 stem rust populations to Kenya, which were planted during the last week of November 2007 at Njoro.

Stem rust resistance in ESWYT and IBWSN. During the 2006–07 off-season in Kenya, we screened 1,650 new CIMMYT advanced lines entering in the first year of yield trials in Mexico and an additional 319 lines entering in the second year of yield trials and seed multiplication for forming international nurseries 29th ESWYT or 41st IBWSN during 2006–07 off-season. All 319 lines and 359 lines selected out of the 1,650, based on grain yield performance and resistance to three rusts, were retested in Kenya during he 2007 main season. During 2007, these materials were evaluated three times; 24 September, 1 October, and 11 October. The first stem rust notes were recorded when several susceptible lines already had 80% severity and a susceptible reaction. By the third notes, the susceptible entries had dried out from the high stem rust infection. A total of 26.3% and 30.1% entries in the two groups of nurseries displayed adequate adult-plant resistance (R, R–MR, and MR categories) under severe stem rust pressure in both years that is expected to be durable because race-specific resistance is not involved. The 7.4% and 19.6% of the entries in the MR–MS category in the two groups of materials also can confer a useful level of resistance or can be used as parents to build additional adult-plant resistance. An additional 9% and 11.6% of the entries carried effective known and unknown race-specific resistance genes. The *Sr25* resistance gene source in the lines being multiplied for inclusion in 30th ESWYT and 41st IBWSN is located in the translocation where a yellow-pigment gene has been eliminated through mutation.

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The global strategy for ex situ conservation with enhanced access to wheat, rye, and triticale genetic resources.

Hans Braun.

The Global Strategy for *ex situ* Conservation with Enhanced Access to Wheat, Rye, and Triticale Genetic Resources was the result of consultations involving genetic resource specialists and crop researchers. The authors, a Strategic Advisory Group (SAG), foresee a strategy that will serve as a dynamic work-in-progress, ever evolving as the client base of collections broaden and vary, as the collections themselves change, and as the world community becomes more aware of the incalculable value of crop genetic diversity. The SAG strongly endorses the support of conservation networks, involving diverse stakeholders oriented towards regional demands, and even involving crops beyond those discussed directly in this report. Bridging diverse cultures, philosophies, and approaches to research, development, and business, to achieve greater and more sustainable food and agricultural development in light of increased awareness of our changing climate are goals we can only fully achieve together.

The SAG was composed of a small group of experts with global experience in all aspects of the conservation and use of the genetic resources of wheat, rye, and triticale. The major global germ plasm collections of wheat, rye, and triticale were identified from existing public databases including those held by the Food and Agricultural Organization of the United Nations (FAO), Bioversity International (formerly the International Plant Genetic Resources Institute, IPGRI), and the European Cooperative Programme for Plant Genetic Resources (ECPGR). Particular emphasis was given to identification of collections holding unique accessions of wild relatives and genetic stocks of wheat. The wild relatives of wheat have proved to be highly useful sources of resistance to biotic and abiotic stresses in wheat breeding over the last two decades, and this trend is expected to accelerate in the future. Similarly, genetic stocks are finding increasing use as tools in the sophisticated application of modern biotechnologies in wheat improvement. Surveys were conducted of genebank managers and users (primarily wheat breeders). Catalogues of collections of precise genetic stocks and wild relatives of wheat also were compiled. Using information gleaned from the surveys and the SAG, a list of key collections that should be targeted for inclusion in global networks of wheat, rye, and triticale genetic resources was developed. Identification of gaps in the existing collections, establishment of priorities to fill those gaps, and plans to meet the most urgent priorities is a high priority. The evaluation of options for the development of integrated information management systems for the global networks of collections of each of the crops and how these fit with both current developments by strong existing networks as well as broad developments in the field of information technology was roundly endorsed.

The full strategy document can be found at http://www.croptrust.org/main/strategies.php?itemid=37.