



**1991-92 Project List
of the CIMMYT Wheat Program**

**For the In-House Wheat
Highlights Meeting**

El Batan, Mexico

September 10-11, 1992

**CENTRO INTERNACIONAL DE MEJORAMIENTO DE MAIZ Y TRIGO
INTERNATIONAL MAIZE AND WHEAT IMPROVEMENT CENTER
Lisboa 27 Apartado Postal 6-641 06600 México, D.F. México**

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1991-92 PROJECT LIST OF THE CIMMYT WHEAT PROGRAM

284 Projects (29 new, 39 terminated)

Key:

† Project description and/or update forthcoming.

‡ Project terminated due to departure of investigator; no update.

? Not sure if update is forthcoming or not.

* Project terminated in 1991-92.

GERMPLASM IMPROVEMENT (92 projects)

Bread Wheat (40 projects)

New Projects

- GIBW9201: Adaptability and stability of performance of bread wheats to Mexican highland areas (ME2). S. Rajaram, A. Hernandez (INIFAP), M. van Ginkel, M. Albarran, and J. Peña.
- GIBW9202: Shuttle breeding between Sichuan Academy of Agriculture Science and CIMMYT to increase yield potential of Sichuan wheats. S. Rajaram, M. van Ginkel, Zhong Hu-He, A. Morgunov (CIMMYT), Zou Yuchun (Sichuan Academy of Agriculture Science).
- GIBW9203: Improvement of industrial quality of bread wheat germplasm possessing the 1B/1R translocation by manipulation of high-molecular weight glutenin subunits. A. Morgunov, S. Rajaram, M. van Ginkel, and J. Peña.
- GIBW9204: Breeding wheats with good breadmaking quality and adaptability to lower Yangtze River region of China (ME2). S. Rajaram, Prof. Lieu, M. van Ginkel, and J. Peña.
- GIBW9205: Breeding slow rusting to leaf rust and high yield potential for North Western Great Plains of India. CIMMYT, Punjab Agriculture University (PAU), Hariyana Agriculture University (HAU), IARI and Punjab Agricultural University (UPAU) (S. Rajaram, R.P. Singh, Jesse Dubin, J.S. Nanda, Mohamad Yunus, K.B.L. Jain).
- GIBW9206: Breeding drought tolerant wheats adapted to Central and Peninsular zone of India (ME4C). S. Rajaram, M. V. Ginkel, Hanchinal (Dharwar) and Izardar (Indore).
- GIBW9207: Comparative yield trials of the best CIMMYT and Indian wheats. S. Rajaram and K.B.L. Jain (IARI).
- GIBW9208: Evaluation and quantification of slow rusting traits to stripe rust involving CIMMYT bread wheats in Ecuador. S. Rajaram, R.P. Singh, and M. Rivadeneira (INIAP, Ecuador).
- GIBW9209: Using spring/winter crosses to increase yield potential of CIMMYT spring wheat, and Chinese winter and facultative wheats. S. Rajaram, He Zhong-hu, Yan Jun(Anyang), Lei Zhengsheng (Zhengzhou), M. van Ginkel, and A.I. Morgunov.

Project Updates

- GIBW6601:** Breeding BW for optimum environments under irrigation (OE). S. Rajaram, M. van Ginkel, Zhong-Hu He, A. Morgunov, M. Camacho (INIFAP based in CIANO, Cd. Obregon, Sonora), R.L. Villareal, R.P. Singh, A. Amaya, J. Peña, K. Sayre, R. Gil Montoya, Yang Jun, H. Vega, J. Montoya, A. Miranda, and M. Albarran.
- GIBW7201 (7203):** Breeding BW for High Rainfall Areas (ME2). S. Rajaram, M. van Ginkel, A. Morgunov, Zhong-Hu He, L. Gilchrist, A. Amaya, J. Peña, R. Gonzalez (INIFAP based in Patzcuaro, Michoacan), R. Gil Montoya, H. Vega, J. Montoya, A. Miranda, and Mario Albarran.
- GIBW7202 (7209):** Breeding winter/facultative bread wheats. S. Rajaram, M. van Ginkel, Zhong-Hu He, M. Albarran, Y. Jun, A. Amaya and J. Peña.
- GIBW7401 (7405):** Breeding BW for Acid Soil Environments (ME3). S. Rajaram, M. van Ginkel, J. Lopez-Cessati, Zhong-hu He, A. Morgunov, A. Amaya, Peña, and R. Gonzalez (INIFAP staff member based in Patzcuaro, Michoacan-Mexico).
- GIBW7501 (7504):** Breeding BW for Drought Tolerance in semiarid environments (ME4). S. Rajaram, M. van Ginkel, Zhong-Hu He, A. Morgunov, K. Sayre, A. Amaya, J. Peña, J. Montoya, A. Miranda, R. Gil Montoya.
- GIBW8001:** Breeding/Screening BW for high temperature tolerance and the late planting conditions of the irrigated regions (ME1). S. Rajaram, Zhong-Hu He, M. van Ginkel, A. Morgunov, R. Gil, J. Montoya, A. Miranda, and H. Vega.
- GIBW8201 (8206):** Breeding BW Resistance to *Helminthosporium sativum* and high temperature tolerance (ME5). S. Rajaram, M. van Ginkel, Zhong-Hu He, A. Morgunov, A. Amaya, and J. Peña.
- GIBW8501 (8510):** Interspecific crosses utilizing durum wheat and synthetics to improve BW yield potential and increase Karnal Bunt resistance. S. Rajaram, M. van Ginkel, Zhong-Hu He, A. Morgunov, G. Fuentes, A. Amaya J. Peña, J. Montoya, A. Miranda, R. Gil, and H. Vega.
- GIBW8701 (8707):** Breeding BW Resistance to Karnal Bunt (*Tilletia indica*). S. Rajaram, M. van Ginkel G. Fuentes, Miguel Camacho (INIFAP based in CIANO, Cd. Obregon), Zhong-Hu He, A. Morgunov, A. Amaya, J. Peña, and J. Montoya.
- GIBW8801 (8808):** Screening BW for salt tolerance. S. Rajaram, Roberto Pargas-Lara (University of Baja California Sur, La Paz), M. van Ginkel, Zhong-Hu He, and A. Morgunov.
- ?GIBW8802:** Breeding BW of double dwarf (DD) stature for highly productive irrigated environments, such as the Yaqui Valley, Punjab, Egypt, and Zimbabwe. S. Rajaram, M. van Ginkel, M. Camacho, Zhong-Hu He, and R.P. Singh.
- GIBW8901 (8927):** The effect of dwarfing genes on yield performance of isogenic lines for semidwarf gene doses in spring wheats. R. Villareal, S. Rajaram, and E. DelToro.
- GIBW8902 (8929):** Yield performance of near-isogenic lines for 1B/1R translocation on some wheat populations. R. Villareal, S. Rajaram, A. Mujeeb-Kazi, and E. Del Toro.

- GIBW8903 (8934): Generation of wheat/rye translocations in hexaploid wheat. W.H. Pfeiffer, S. Rajaram, and J. Pena.
- GIBW9001 (9011): Shuttle breeding between (Jiangsu Academy of Agriculture Science) and CIMMYT, to increase the productivity of Chinese germplasm while maintaining Scab tolerance and adaptability to the Yangtze Region of China. S. Rajaram, Chaofei Zhou (Nanjing), M. van Ginkel, Zhong-Hu He, and A. Morgunov.
- GIBW9002 (9012): YR/BW breeding shuttle Ethiopia/CIMMYT. M. van Ginkel, G. Gebeyehu, and S. Rajaram
- GIBW9003 (9013): YR/BW genetics. M. van Ginkel, G. Gebeyehu, and S. Rajaram.
- GIBW9004 (9015): *Fusarium*/BW genetics. M. van Ginkel, L. Gilchrist, S. Rajaram *
- GIBW9005 (9020): Selection methodologies for drought tolerance BW. M. van Ginkel and S. Rajaram.
- GIBW9006 (9016): Mechanism of resistance to *Septoria tritici*/BW. M. van Ginkel, C. van Silfhout, G. Kema, and Z. Eyal. *
- GIBW9007 (9021): Evaluation and selection of N-use efficiency/BW. M. van Ginkel, I. Ortiz-Monasterio, S. Rajaram, and K. Sayre.
- GIBW9008 (9019): Drought tolerance/BW breeding. M. van Ginkel, R. Pargas, and S. Rajaram.
- GIBW9009 (9030): Yield evaluation of advanced derivatives from *Agropyron distichum*. R. Villareal, S. Rajaram, A. Mujeeb-Kazi, and E. DelToro.
- GIBW9010 (9031): Yield evaluation of tissue culture derived Pavon'S' lines. R. Villareal, A. Mujeeb-Kazi, R. Waskom, S. Rajaram, and E. DelToro.
- GIBW9011 (9032): Agronomic and yield evaluation of salt tolerant bread wheats in optimum environment. R. Villareal, A. Mujeeb-Kazi, S. Rajaram, E. DelToro, and J. Cesati.
- GIBW9012 (9033): Comparison of somaclonal variants from different bread wheat genotypes. R. Villareal, N. ter Kuile, R. Waskom, E. DelToro, S. Rajaram, and A. Mujeeb-Kazi.
- GIBW9101: An evaluation of synthetic hexaploid wheats derived from *Triticum turgidum* x *Triticum tauschii*. R. Villareal, A. Mujeeb-Kazi, S. Rajaram, and E. DelToro
- GIBW9102: The genetics of Kamal bunt resistance on some synthetic hexaploid wheats x bread wheat crosses. R. Villareal, S. Rajaram, A. Mujeeb-Kazi, G. Fuentes, and E. DelToro.
- ?GIBW9103: Identification of transgressive segregants using RFLP in bread wheat x synthetic hexaploid backcross populations. R. Villareal, S. Rajaram, M. Sorrells, and A. Mujeeb-Kazi.
- GIBW9105 (9114): Drought/salt/BW geneticist/breeding. M. van Ginkel, Ch. A. Snijders, and E. Haro.

Durum Wheat (15 projects)

Project Updates

- GIDW8901:** Breeding durum wheat (DW) for optimum (irrigated) environments. O. Abdalla, J. Dieseth, R. Singh, A. Amaya, J. Peña, and J. Borja.
- GIDW8902:** Breeding durum wheat (DW) for high rainfall, including highland, environments. O. Abdalla, J. Dieseth, R. Singh, L. Gilchrist, A. Amaya, J. Peña, and J. Borja.
- GIDW8903:** Breeding DW for semiarid environments. O. Abdalla, J. Dieseth, M. Nachit, A. Amaya, J. Peña, and J. Borja.
- GIDW8904:** Shuttle breeding to improve durum productivity in Ethiopia and stem rust resistance in CIMMYT durum wheat germplasm. O. Abdalla, T. Tesafaye, J. Dieseth, A. Roelfs, and J. Borja.
- GIDW8905:** Effects of 1B/1R translocation on durum wheat productivity and quality. O. Abdalla, A. Mujeeb-Kazi, A. Amaya, J. Peña, and J. Dieseth.
- ?GIDW8906:** Expression of agronomic traits in different cereal cultivars under variable moisture regimes. O. Abdalla; R. Trethowan; and J. Borja.
- GIDW9001:** Screening durum wheat for tolerance to salt. O. Abdalla, H. Fraga, R. Lara, J. Dieseth, and J. Borja.
- GIDW9002:** Effects of selected morphological traits on durum wheat grain yield in differing environments. O. Abdalla, T. Payne, R. Hanchinal, and J. Dieseth.
- GIDW9003:** Genetic variability and heritability of selected agronomic traits in Ethiopian durum landraces. O. Abdalla; T. Tesafaye; J. Dieseth; and J. Borja.
- GIDW9004:** Introgression of landrace varieties in durum wheat and its impact on yield performance and stability, and grain quality characteristics. O. Abdalla; T. Tesafaye; J. Dieseth; and J. Borja.
- GIDW9005:** Introgression of the *Triticum dicoccum* gene pool with spring durum wheat and its impact on grain yield, yield components, and grain quality under differing environments. O. Abdalla; R. Hanchinal; B. Skovmand; A. Amaya; and J. Dieseth.
- GIDW9006:** The amount and distribution of genetic variability in CIMMYT derived DW germplasm. T. Payne, O. Abdalla, and J. Peña.
- GIDW9101:** Breeding facultative durum wheat. O. Abdalla, M. Nachit, T. Payne, J. Dieseth, A. Amaya, and J. Peña.
- GIDW9102:** Enhancement of tan spot resistance in CIMMYT DW germplasm. O. Abdalla, L. Gilchrist, E. Elias, J. Dieseth, A. Amaya, and J. Peña.
- GIDW9103:** Introgression of fusarium head blight resistance in DW germplasm. O. Abdalla, J. Dieseth, A. Amaya, and J. Peña.

Triticale (11 projects)

Project Updates

GITC8901: Breeding triticale for high rainfall and acid soil environments. W. Pfeiffer, S. Immonen, L. Gilchrist, R. Singh, E. Duveiller, A. Amaya, and J. Peña.

GITC8902: Breeding Tcl for moisture stress environments. W. Pfeiffer, K. Sayre, A. Amaya, and J. Peña.

GITC8903: Expansion of genetic base in Tcl. W. Pfeiffer and S. Immonen.

GITC8904: Breeding for forage and feed/forage dual purpose Tcl. W. Pfeiffer, S. Immonen, A. Amaya, and J. Peña.

***GITC9007:** Comparison of two media and two culture temperature for plant regeneration of embryogenic callus from immature wheat x rye hybrid embryos. S. Immonen.

Projects Terminated, No Updates

‡**GITC8905:** Callus induction and plant regeneration from immature triticale embryos. S. Immonen.

‡**GITC8906:** Testing four media and cold pre-treatment in embryo culture of immature hybrid durum wheat x rye embryos. S. Immonen.

‡**GITC9002:** Improved method for primary triticale production. S. Immonen.

‡**GITC9004:** Use of colchicine in callus culture of immature embryos from wheat x rye crosses for producing diploid plants through callus culture. S. Immonen.

‡**GITC9006:** Follow-up to GITC9002: Improvement of seed-set of durum wheat and bread wheat x rye crosses by use of Gibberellic acid and double pollination. S. Immonen.

‡**GITC9008:** Crossability of the 4x and 6x wheat and rye progenitors used in CIMMYT Triticale Section in triticale primary production. S. Immonen.

ICARDA/CIMMYT Barley (7 projects)

Project Updates

GIBA8301: Development of high yielding barley germplasm with multiple disease resistance for Latin America. H. Vivar.

GIBA8302: Developing early maturity barley with disease resistance. H. Vivar.

GIBA8603: Developing hull-less barley with multiple disease resistance. H. Vivar.

GIBA8304: Developing early barley germplasm with scab and Barley Yellow Mosaic Virus (BYMV) resistance for China. H. Vivar.

GIBA8905: Agronomy, medic-barley rotation. H. Vivar and I. Ortiz-Monasterio.

GIBA8806: Development of barley resistant to dwarfing of Nariño, BYD, and leaf and stripe rust from Colombia and Ecuador. H. Vivar.

GIBA8407: Development of germplasm tolerant to Russian wheat aphid. H. Vivar and J. Robinson.

Industrial Quality (7 projects)

Project Updates

†*GIIQ8901: Influence of mixing speed on dough properties and breadmaking quality of normal and 1B/1R translocation wheat lines. A. Amaya; R.J. Peña; N. ter Kuile; S. Rajaram, and A. Mujeeb-Kazi.

†*GIIQ8601: Rheological and biochemical properties of complete and substitute triticales in relation to breadmaking quality. R.J. Peña, A. Amaya, and J. Zarco-Hernandez.

†GIIQ9002: Electrophoretic identification of 1B/1R translocation wheats by the evaluation of water-soluble (albumins) extracts: An assessment of the Graybosh and Morris (University of Nebraska) Technique. R.J. Peña, A. Amaya, J. Zarco-Hernandez, S. Rajaram, and A. Mujeeb-Kazi.

†GIIQ9003: Influence of 6D/6A substitution on gluten properties and breadmaking quality of triticale: A fractionation-reconstitution study. R.J. Peña, A. Amaya, and W.H. Pfeiffer.

†GIIQ9004: High molecular weight glutenin subunit composition (SDS-PAGE) of spring bread wheat progenitors and candidates to IBWSN: A continuous appraisal. A. Amaya; R.J. Peña; S. Rajaram, and M. van Ginkel.

†*GIIQ8801: Electrophoresis (SDS-PAGE, A-PAGE) as a potential tool to differentiate complete from substitute triticale genotypes: R.J. Peña, A. Amaya, B. Skovmand, and P. Gustafson (Univ. of Missouri).

†*GIIQ8802: Functional (breadmaking) and biochemical characteristics of durum wheats with improved breadmaking quality. A. Amaya, R.J. Peña, and R. Rodríguez.

International Nurseries (9 projects)

Project Updates

†GIIN8901: Long-term relationships among international testing locations based on yield data. P. Fox, I. Delacy, J. Crossa, W. Pfeiffer, S. Rajaram, and J. Corbett.

†GIIN8902: Investigation of multivariate techniques for interpreting international yield trials. P. Fox, J. Crossa, W. Pfeiffer, S. Rajaram, and M. van Ginkel.

†GIIN8903: Coefficients of parentage. P. Fox, E. Souza, D. Byerlee, T. Payne, M. van den Berg, J. Crossa, S. Rajaram, and E. Auriague.

†*GIIN8904: International stress trial. P. Fox, C. Gonzalez, K. Sayre, W. Pfeiffer, S. Rajaram, and O. Abdalla.

- †GIIN8905: Cytoplasmic diversity in CIMMYT bread wheats. P. Fox, M. van den Berg, M. Khairallah, S. Rajaram, M. van Ginkel, and B. Skovmand.
- †GIIN8906: Application of CERES (Crop Estimation through Resources and Environment Synthesis) wheat model to spring wheat in the Yaqui Valley (Sonora State of Mexico). M. Alcala, J.R. Kiniry, R.A. Fischer, K. Sayre, M. Reynolds, and M. Bell.
- †GIIN9001: Comparison of bread wheat populations developed at single sites and by shuttle breeding. P. Fox, S. Rajaram, M. van Ginkel, and E. Acevedo.
- †GIIN9102: Use of genetic probes to characterize selection environments and interpret adaptation of bread wheats. P. Fox, D. Woodruff, S. Rajaram, R.A. Fischer, E. Acevedo, and I. Delacy.
- †GIIN9101: Seed washing/disinfecting system using an auger design as a main component for removing and killing Karnal bunt spores on wheat seed. M. Alcala, H. Muthar, and L. Butler.

Training (3 projects)

Project Updates

- *GITR8901: An evaluation of the CIMMYT wheat improvement in-service training program. R. Villareal and E. DelToro.
- *GITR8902: Pre- and post-course evaluation methods to assess a wheat improvement training course. R. Villareal and E. DelToro.
- GITR9101: Breeding wheat for early maturity in a dominant male sterile population using recurrent selection. R. Villareal, M. Sorrells, and S. Rajaram.

GENETIC RESOURCES (50 projects)

Conservation (5 projects)

Project Updates

- GRGR8201: Multiplication and regeneration of accessions. B. Skovmand, M. Hernandez, and M. Ibarara.
- GRGR8202: Monitoring seed viability of the collection. B. Skovmand; M. Hernandez; M. Ibarra.
- GRGR8303: The establishment of duplicate collection in other physical locations. B. Skovmand, GRU-ICARDA, IBPGR-FAO, NSSL.
- GRGR8904: Conservation of North American Genetic Resources of Triticale. C.O. Qualset, B. Skovmand, B. Furman, and J. Heaton.
- GRGR8905: The establishment of a Base Collection of hexaploid wheat and triticale. B. Skovmand

Documentation (6 projects)

Project Updates

*GRGR8806: Publishing an abbreviation list of wheat cultivars released and important in wheat breeding. B. Skovmand.

GRGR8907: Develop a database to collect data on releases of bread and durum wheat, and triticale. Wheat and Economics Program staff.

GRGR8908: Development of a database system to handle passport, logistic, and evaluation data. B. Skovmand, SCS (Henrik Schou), and CG-NET.

*GRGR8909: Development of a corollary to the maize publication "Seed Conservation and Distribution. The Dual Role of the CIMMYT Maize Germplasm Bank". B. Skovmand, G. Varughese, and G.P. Hettel.

GRGR9023: Developing a source population for different traits based on the male dominant sterile. B. Skovmand and G. Varughese.

GRGR9126: Development of tools in support of the Wheat Pedigree Management System (WPMS). B. Skovmand, wheat staff, and SCS.

Collection (3 projects)

Project Updates

GRGR8810: Collection or acquisition of obsolete cultivars. B. Skovmand.

GRGR8911: Collection of landrace cultivars introduced to Mexico from Spain in the period after the colonial conquest. B. Skovmand, IBPGR, and INIFAB.

GRGR8912: Collection of barley and wheat landraces in Tibet. S. Jana (Canada); H. Bryan (Canada); B. Fraleigh (Canada); J. Valkoun (ICARDA); B. Damanian (ICARDA); the Chinese; and B. Skovmand (CIMMYT).

Evaluation (9 projects)

Project Updates

GRGR8813: Screening for different sources of resistance to *S. tritici* blotch. B. Skovmand and L. Gilchrist.

GRGR8814: Screening for adaptation to increased temperature. B. Skovmand.

GRGR8916: Screening of *T. dicoccum* for traits with utility in bread and durum wheat improvement. B. Skovmand; O. Abdalla, J. Peña, R.R. Hanchinal (India), S. Fuentes (CIMMYT, Ecuador), J. Tola (Ecuador), and A.B. Damania (ICARDA).

GRGR8917: Verification of the identities of the accessions in the wheat collection. B. Skovmand, S. Rajaram, W. Pfeiffer, O. Abdalla, G. Varughese, H. Vivar, and N.E. Borlaug.

- GRGR8918: To identify awnless durum wheats and triticales and to transfer this character to improved types. B. Skovmand; W. Pfeiffer; and O. Abdalla.
- GRGR8919: Screening accessions to identify different sources of resistance to *Helminthosporium sativum*. B. Skovmand and L. Gilchrist.
- GRGR9020: Investigate stem rust race found in Tlaltizapan which apparently did not infect Morocco. B. Skovmand and R. Singh.
- GRGR9024: Evaluate the effect of fungicides on seedborne pathogens and effect of fungicides on viability. B. Skovmand and L. Butler.
- GRGR9125: Establishment of a screening program for resistance to common bunt (*Tilletia foetida*). B. Skovmand and E.E. Saari.

Improvement (2 projects)

Project Updates

- GRGR8921: Selecting a rye population with a high level of aluminum toxicity tolerance. B. Skovmand, J. Lopez-Cesati, and W. Pfeiffer.
- GRGR9022: Backcrossing flooding tolerance from 'Alkana' and 'Tchere' (Mali wheats) into background with rust resistance. B. Skovmand and M. van Ginkel.

Wide Crosses (25 projects)

New Project

- GRWX9201: Development of markers based on randomly amplified polymorphic DNA sequences in alien derives wheat. M.D.H.M. William, A. Mujeeb-Kazi, and D. Hoisington.

Project Updates

- GRWX8901: Development of alien addition lines in a *Triticum aestivum* or *T. turgidum* background. A. Mujeeb-Kazi, M.D.H.M. William, V. Rosas, R. Delgado, and A. Rosas
- GRWX8902: Cytogenetic study of complete and partial synthetics derived from self-fertile backcross I intergeneric hybrids between *Triticum aestivum* and alien species. A. Mujeeb-Kazi, M.D.H.M. William, A. Cortes, and V. Rosas.
- GRWX8903: Characterization and practical significance of a spontaneous disomic *Elymus giganteus* chromosome substitution for chromosomes of *Triticum aestivum*. A. Mujeeb-Kazi and M.D.H. William.
- GRWX8904: Establishing and/or application of biochemical markers to facilitate detection of alien introgression into *Triticum aestivum*. M.D.H. William and A. Mujeeb-Kazi.
- GRWX8905: Identifying salt tolerance in *Thinopyrum bessarabicum* ($2n=2x=14$) and its transfer to *Triticum aestivum*. A. Mujeeb-Kazi and J.L. Cesati.

- GRWX8906:** Maintenance and utilization of *Triticum tauschii* for *T. aestivum* improvement. A. Mujeeb-Kazi, M.D.H. William, R.J. Peña, S. Rajaram, G. Fuentes, and J.L. Cesati.
- GRWX8907:** Callus culture applications for inducing wheat/rye chromosomal exchange using *Triticum aestivum* L. cv. Chinese Spring and its Imperial rye disomic additions. A. Mujeeb-Kazi, M.D.H. William, and S. Cano.
- GRWX8908:** Production of primary hexaploid and octoploid triticales. A. Mujeeb-Kazi, G. Varughese, and A. Lopez.
- GRWX8909:** Role of rye translocations 1A/1R and 5A/5R in wheat breeding and their transfer to some CIMMYT wheat cultivars. A. Mujeeb-Kazi and M.D.H.M. William.
- GRWX8910:** Production of Seri-82 homozygous for chromosome 1B and Altar 84 homozygous for chromosome 1B/1R. A. Mujeeb-Kazi, M.D.H.M. William, S. Rajaram, R.J. Peña, and A. Amaya.
- GRWX8911:** Exploitation of ph1b locus in intergeneric hybridization. A. Mujeeb Kazi, M.D.H.M. William, J. López-Cesati, J.L. Cesati, and G. Fuentes.
- GRWX8912:** Development of cytogenetic stocks in CIMMYT wheats. A. Mujeeb-Kazi, M.D.H.M. William, R. Delgado, V. Rosas, and A. Cortes.
- GRWX8913:** Inducing translocations between random or specific alien genome chromosomes and those of the D genome of *Triticum aestivum* L. A. Mujeeb-Kazi and M.D.H.M. William.
- GRWX8914:** Induction of amphiploids from *Triticum aestivum* and *T. turgidum* x Alien species intergeneric hybrids. A. Mujeeb-Kazi, M.D.H.M. William, R. Delgado, A. Cortes, and V. Rosas.
- GRWX8915:** Production and cytogenetics of intergeneric hybrids in the Triticeae. A. Mujeeb-Kazi.
- GRWX8916:** Practical applications of wide hybridization through field testing: Applied studies. A. Mujeeb-Kazi, S. Roldan, R. Delgado, and A. Ramirez.
- GRWX8917:** Callus culture applications for facilitating alien genetic transfers in intergeneric hybrids of *Triticum aestivum* x *Aegilops variabilis*. A. Mujeeb-Kazi, M. Nabors, and S. Cano.
- GRWX9001:** Yield evaluation of *Agropyron curvifolium* derived *Helminthosporium sativum* resistant lines. A. Mujeeb-Kazi, R. Villareal, S. Rajaram, L. Gilchrist, and E. DelToro.
- GRWX9002:** Production of *Triticum aestivum* polyhaploids from *T. aestivum* x *Zea mays* crossing. A. Mujeeb-Kazi, O. Riera-Lizarazu, and M.D.H.M William.
- GRWX9003:** Salt tolerance screening of *T. aestivum* cultivars and wide cross derivatives. A. Mujeeb-Kazi and J.L. Cesati.

GRWX9004: Monosomic analysis for the identification of aluminum tolerance gene/s in *Triticum aestivum*. A. Mujeeb-Kazi and J.L. Cesati.

GRW9005: Characterization of various *Triticum aestivum* accessions containing rye (*Secale cereale*) chromosomes or segments of varying lengths using biochemical markers. M.D.H.M. William and A. Mujeeb-Kazi.

GRWX9006: Characterization of various derivatives involving *Triticum aestivum* and certain alien species by *in situ* hybridization using genome specific probes. M.D.H.M. William and A. Mujeeb-Kazi.

GRWX9007: Characterization of derivatives involving *Triticum aestivum* and certain alien species by *in situ* hybridization using total genomic DNA in conjunction with blocking DNA. A. Mujeeb-Kazi and D. Hoisington.

CROP PROTECTION (80 projects)

Rusts (26 projects)

New Project

CPRU9216: Genetics of adult plant resistance to stripe (yellow) rust in bread wheats. R.P. Singh.

Project Updates

CPRU8901: Mexican *P. recondita* and *P. graminis* pathogenicity survey on bread wheat, durum wheat, and triticale. R.P. Singh.

CPRU8902: Global *P. recondita*, *P. graminis*, and *P. striiformis* pathogenicity surveys. R.P. Singh, J. Huerta, and A. Roelfs.

CPRU8903: Characterization of known *Lr* genes and additional adult plant resistance in bread wheat cultivars from various countries and important CIMMYT genotypes. R.P. Singh.

CPRU8904: Comparison of partial adult-plant resistance to leaf rust in IBWSN germplasm in 5-years increments beginning with the 4th IBWSN. R.P. Singh, B. Skovmand, and S. Rajaram.

CPRU8905: Genetics of adult-plant resistance to leaf rust in bread wheats. R.P. Singh.

CPRU8906: Analysis of stability and durability of partial adult-plant resistance to leaf rust in CIMMYT wheats. R.P. Singh and S. Rajaram.

***CPRU8907:** Study of additiveness and transgressive segregation for improved adult plant partial resistance to leaf rust. R.P. Singh and S. Rajaram.

CPRU8908: Chromosomal location of adult plant resistance genes to leaf rust in Buckbuck"S" and Opata 85. R. Singh and A. Mujeeb-Kazi.

- CPRU8909: Comparison of crossing and selection methodologies for the transfer of adult plant partial resistance to leaf rust in a high yielding background. R. Singh and S. Rajaram.**
- *CPRU8910: Backcrossing additional genes for partial adult plant resistance in 'Kauz'. R.P. Singh and S. Rajaram.**
- CPRU8912: Evaluation of losses due to leaf rust and testing of new fungicides. R.P. Singh and P. Figueroa.**
- *CPRU8913: Genetics of stem rust and/or leaf rust resistance in durum wheat. R.P. Singh and O. Abdalla.**
- CPRU9014: Genetics of leaf rust resistance in triticales. R. Singh and W.H. Pfeiffer.**
- *CPRU9115: Genetics of yellow rust resistance in wheats carrying *Lr34* for leaf rust resistance. R.P. Singh.**
- †CPRU8902: Evaluation of durum wheat genotypes for partial resistance to stem rust. L.H.M. Broers.**
- †CPRU8903: Genetic analysis of some bread wheat genotypes that have shown durable resistance to yellow rust in different yellow rust hot spots of the world. L.H.M. Broers, D. Danial (Kenya), and M. van Ginkel.**
- †CPRU9001: Comparison of methods to select for partial resistance in wheat to yellow rust. L.M.H. Broers.**
- †CPRU9002: Comparison of methods to select for partial resistance in wheat to yellow rust (Gene bank material). L. Broers.**
- †CPRU9003: Interplot interference in the durum-stem rust system. L.H.M. Broers.**
- †CPRU9004: Analysis of components of partial resistance in durum wheat to stem rust. L.H.M. Broers.**
- †CPRU9005: Some histological observations on partial resistance in durum wheat to stem rust. L.H.M. Broers.**
- †CPRU9006: Component analysis of partial resistance in wheat to yellow rust. L.H.M. Broers.**
- †CPRU9007: Influence of certain weather conditions on infection types of yellow rust on wheat. L.H.M. Broers.**
- †CPRU9008: Genetic analysis of some durum wheat genotypes that have shown partial resistance to stem rust. L.H.M. Broers and O. Abdalla.**
- †CPRU9101: Analysis of stripe rust (YR) race and seedling virulence patterns, field response data, and the relationship to commercial cultivars and CIMMYT germplasm. E.E. Saari and R. Stubbs.**

Helminthosporium (8 projects)

Project Updates

- †CPHS8901: Monitoring nursery for *Helminthosporium sativum* diseases. L. Gilchrist, P. Fox, M. Alcala, H. Vega, F. Cardenas (CIMMYT), J. Hetzler (Göttingen University, Germany), and Y.R. Metha (IAPAR, Londrina, Brazil).
- †CPHS8902: Identification and evaluation of material resistant to *H. sativum* in the field (leaf, spike, grain and node reaction) in cereals. L. Gilchrist, A. Mujeeb-Kazi, S. Rajaram, W. Pfeiffer, H. Vivar, and B. Skovmand.
- †*CPHS8903: Resistance to *Helminthosporium sativum* in bread wheat: Association among plant parts with infection and agronomical and physiological traits. L. Gilchrist and W.H. Pfeiffer.
- †CPHS8904: Progress in developing bread wheat resistant to *H. sativum*. L. Gilchrist, W. Pfeiffer, and S. Rajaram.
- †CPHS8905: Variability infection study of *H. sativum* under Poza Rica conditions. L. Gilchrist and J. Lopez-Cessati.
- †CPHT8907: Adaptation of a selection screening method in seedlings under greenhouse conditions and adult plants under field conditions. L. Gilchrist and C. Velazquez.
- †*CPHS9008: Resistance to *Helminthosporium sativum* in triticale: Association of plant parts to infection and agronomic and physiologic traits. L. Gilchrist and W.H. Pfeiffer.
- †*CPHS9009: Histopathological and histochemical studies of *H. sativum* in resistant and susceptible bread wheats and wide cross lines: Relationship between three planting dates and grain infection in Poza Rica (Masters Degree Thesis, C. Postgraduados, Chapingo). L. Gilchrist, R. Alvarez, S. Osada, and E. Cardenas.

Septoria tritici (8 projects)

New Project

- † CPST9201: Inheritance of resistance to septoria tritici blotch (*Mycosphaerella graminicola*) in bread wheat. L. Gilchrist, S. Rajaram, I. Mathus (M.Sc. student), and D. Molina (Chapingo).

Project Updates

- †CPST8908: *Septoria tritici* disease monitoring nursery. L. Gilchrist, P. Fox, F. Cardenas (CIMMYT), C. van Silfhout (IPO Holland), and Z. Eyal (Israel).
- †CPST8909: Evaluation of resistant *Septoria tritici* material. L. Gilchrist; S. Rajaram; M. van Ginkel; A. Mujeeb-Kazi; and B. Skovmand.
- †CPST8910: Characterization of resistant, slow develop and tolerant material to *Septoria tritici*. L. Gilchrist, S. Rajaram, and M. van Ginkel.

- †CPST9010: Study of the inheritance of *Septoria tritici* resistance in bread wheat. L. Gilchrist, S. Rajaram, and M. van Ginkel.
- †CPST8911: Study of the inheritance of *Septoria tritici* resistance in selected durum wheat lines. L. Gilchrist and O. Abdalla.
- †CPST8912: *Septoria tritici* resistance study in durum wheat outside of Mexico. L. Gilchrist, O. Abdalla, P. Fox, and F. Cardenas.
- †CPST9113: *Septoria tritici* virulence distribution for bread wheat in Mexico. L. Gilchrist, C. Velazquez, R. Gonzalez, E. Villasenor, and J. Ireta.
- †CPST9114: Relationship between *Septoria tritici* virulence reactions in 30 wheat varieties under field and greenhouse conditions. L. Gilchrist and C. Velazquez.

Virulence Collection (1 project)

Project Update

- †CPVC8906: *H. sativum*, *H. tritici repentis*, *S. tritici*, and *S. nodorum* virulences collection. L. Gilchrist and C. Velazquez.

Barley Yellow Dwarf (10 projects)

New Projects

- CPBD9201: Identification of sources of resistance in selected germplasm lines of spring bread wheat, spring barley, triticales and wide cross material. L. Bertschinger, A. Mujeeb-Kazi, W.H. Pfeiffer, J. Robinson, R.P. Singh, B. Skovmand, R. Villareal, and H. Vivar.
- CPBD9202: Characterization of the relation between virus titres symptoms, expression, and yield loss in selected contrasting bread wheat and barley lines inoculated at various growth stages. L. Bertschinger, J. Segura, and R.P. Singh.
- CPBD9203: Characterization of the interaction between BYDVs, host genotype, and temperature in selected bread wheat lines. L. Bertschinger.

Project Updates

- CPBD8401: Screening germplasm lines for resistance to barley yellow dwarf viruses (BYDVs) under natural infections in the field. L. Bertschinger, S. Rajaram; W. Pfeiffer; H. Vivar; O. Abdalla; A. Mujeeb-Kazi; B. Skovmand; C. Qualset, and A. Comeau.
- CPBD8501: Studying the genetics of resistance to barley yellow dwarf viruses (BYDVs) and evaluating progenies for their resistance to BYDV. M. Albaren; S. Rajaram; R. Singh; H. Vivar; A. Comeau, and C. Qualset.
- *CPBD8601: The effect of barley yellow dwarf virus (BYDV) on the yield of cereals in Mexico. P.A. Burnett and R. Ranieri.

- *CPBD8701: Trapping live cereal aphids and determining the percentage that are able to transmit barley yellow dwarf viruses (BYDVs). P.A. Burnett and R. Ranieri.
- *CPBD8702: Variation in serotypes of barley yellow dwarf viruses (BYDVs) in cereals in the Toluca Valley and Mexico. P.A. Burnett, R. Ranieri, D. Jeffers, and S. Koch.
- CPBD8801: Survey of barley yellow dwarf viruses (BYDVs) serotypes in cereal nurseries in Latin America, Asia, and Africa. L. Bertschinger, R. Lister, Outreach staff, and Cooperators.
- *CPBD9001: Assessment of barley yellow dwarf virus titres in "field resistant" barleys, wheats, and wide crosses. R. Ranieri and P.A. Burnett.

Russian Wheat Aphid (1 project)

Project Update

- *CPBD8901: Screening germplasm for resistance to Russian wheat aphid (RWA). J. Robinson and P.A. Burnett.

Soilborne Diseases (2 projects)

Projects Terminated, No Updates

- ‡CPSP8801: Effects of crop rotation and management practices on incidence of soilborne diseases at El Batan. K. Sayre and D. Lawn.
- ‡CPSP8902: Screening cereals for resistance to *Sclerotium rolfsii*. D. Lawn and B. Skovmand.

Karnal Bunt (14 projects)

New Projects

- CPKB9201: Karnal bunt seed assay in Guanajuato. G. Fuentes-Davila and M. Rosas-R.
- CPKB9202: Identification of sources of resistance to *Ustilago tritici*, the causal agent of Loose smut of wheat. G. Fuentes-Davila and S. Rajaram.
- CPKB9203: Fingerprinting and identification of *Tilletia indica* and *Tilletia barclayana* using molecular markers. G. Fuentes-Davila and M. Fischer.

Project Updates

- CPKB8801: Identification of sources of resistance to *Tilletia indica*, the causal agent of the Karnal bunt disease of wheat. G. Fuentes-Davila; S. Rajaram; M. Van-Ginkel; R. Rodriguez-Ramos; A. Mujeeb-Kazi; W. Pfeiffer; and O. Abdalla.
- CPKB8802: Improvement of inoculation and evaluation techniques, and selection criteria in applied research on Karnal bunt. G. Fuentes-Davila.

- CPKB8803: Chemical control of Karnal bunt by application of fungicides during the flowering stage, and seed treatment. G. Fuentes-Davila and F. Salazar-Huerta.
- CPKB8902: Sporidia trapping of *Tilletia indica*, the causal agent of the Karnal bunt disease of wheat. G. Fuentes-Davila.
- ?CPKB9001: Effect of fungicide dressing on survival of *Tilletia indica* teliospores in buried wheat grain. S.K. Mann; G. Fuentes-Davila; and R.A. Fischer.
- CPKB9002: Longevity of teliospores of *Tilletia indica* in soil. G. Fuentes-Davila.
- CPKB9003: Heritability of resistance to KB in bread wheat as determined by diallel analysis. G. Fuentes-Davila; S. Rajaram; and J. Montoya-Moroyoqui.
- CPKB9004: Identification of sources of resistance to *Ustilago nuda*, the causal agent of Loose smut of barley. G. Fuentes-Davila and H.E. Vivar.
- CPKB9005: Testing diverse populations of the Karnal bunt pathogen to confirm worldwide applicability of local resistance, breeding and seed treatment research at CIMMYT, and to develop new approaches to seed treatment procedures. G. Fuentes-Davila, L. Butler, S. Rajaram, and M. Bonde.
- CPKB9101: *Tilletia indica*: studies on the inoculation of wheat under natural conditions. G. Fuentes-Davila, E.E. Saari, and S. Nagarajan
- *CPKB9102: Effect of fumigants on viability of *Tilletia indica* teliospores in soil. G. Fuentes-Davila and D. Lawn.

Bacterial Diseases (10 projects)

Project Updates

- *CPXA8701: Evaluation of potential bacteriocide seed treatments for control of *Xanthomonas campestris* pv. *undulosa*. E. Duveiller.
- *CPXA8801: Study of yield losses in bread wheat attributed to *Xanthomonas campestris* pv. *undulosa*. E. Duveiller and H. Maraite (UCL/Louvain-la-Neuve, Belgium).
- *CPXA8802: Heritability of resistance to *Xanthomonas* in triticale as determined by diallel analysis. E. Duveiller; O. Abdalla; and R. Trethowan.
- CPXA8803: Study of the possibility of biological control of bacterial leaf streak. E. Duveiller.
- *CPXA8901: Improvement of a detection method using growing-on technique for *Xanthomonas* in the greenhouse. E. Duveiller.
- *CPXA8902: Application of monoclonal antibodies (Mas) in seed detection of *Xanthomonas*. E. Duveiller, and C. Bragard (UCL/Louvain-la-Neuve, Belgium).
- CPXA8903: Epidemiology of bacterial leaf streak caused by *Xanthomonas campestris* pv. *undulosa*. E. Duveiller; H. Maraite (UCL/Louvain-la-Neuve, Belgium); and N. Gérard (UCL student/Louvain-la-Neuve, Belgium).

CPXA8904: Heritability of resistance to *Xanthomonas* in bread wheat by diallel analysis. E. Duveiller; M. van Ginkel; and S. Rajaram.

CPXA8905: Special publication with criteria for the identification of bacterial leaf streak and presentation of a methodology to screen for resistance to the disease. E. Duveiller and H. Maraite (UCL/Louvain-la-Neuve, Belgium).

***CPXA8906:** Study of near-isogenic lines with different dwarfing genes or earliness for understanding the relationship between plant size and bacterial leaf streak expression. E. Duveiller; W. Pfeiffer; M. van Ginkel, and S. Rajaram.

CROP MANAGEMENT & PHYSIOLOGY (51 projects)

Agronomic Support to Breeding (9 projects)

New Projects

MPPP9201: Assessment of yield-losses by bread wheat to foliar diseases at El Batan. K. Sayre; L. Gilchrist; R.P. Singh; S. Rajaram; and G. Saari.

MPWL9201: Assessment of the tolerance of cereals to variable soil waterlogging conditions. K. Sayre, M. van Ginkel, and I. Ortiz-Monasterio.

MPOF9201: On-farm research in the Yaqui Valley. K. Sayre, I. Ortiz-Monasterio, A. Limon, S. Rajaram, and O. Abdalla from CIMMYT; M. Camacho and O. Moreno from CIANO.

Project Updates

MPWC8601: Weed control practices for nurseries grown on 90-cm beds. K. Sayre and I. Ortiz-Monasterio.

MPWC8602: Improvement of weed control practices for yield trials. K. Sayre and I. Ortiz-Monasterio.

MPWC8603: Herbicide screening for phytotoxicity effects on bread wheat, durum wheat, triticale, and barley. K. Sayre, I. Ortiz-Monasterio, and respective crop leaders.

MPCR8601: El Batan station management rotation trial. K. Sayre, M. Bell, and L. Gilchrist.

MPPP9001: Evaluation of economic yield importance of leaf rust resistance in bread wheat. K. Sayre and R.P. Singh.

***MPTP9001:** Strategies on patterns and frequency of subsoiling. I. Ortiz-Monasterio and K. Sayre.

Physiologic Support to Breeding (18 Projects)

New Projects

MPBW9201: Morphology and phenology of high yielding bread wheats. P. Stefany.

MPBW9202: Investigation of the potential of the introduction of genetic material from diploid ancestor species for the increase in yield potential of bread wheat. D. Rees, E. Acevedo, A. Mujeeb-Kazi, and R.L. Villareal.

MPBW9203: The relationship between stomatal conductance of individual leaves and canopy temperatures--potential selection method for high yielding varieties. D. Rees, K. Sayre, A. Limon, E. Zeige, and E. Acevedo.

MPGC9201: Control of morphology and phenology of bread wheats. P. Stefany.

Project Updates

MPDR8501: Use of the line source gradient irrigation system for evaluating breeding materials for drought response. K. Sayre, S. Rajaram, W. Pfeiffer, and O. Abdalla.

MPGC8601: Characterization of the agronomic performance of innovative genotypes originating in the former Germplasm Development Section. K. Sayre.

MPGN8601: Nitrogen rate x genotype of bread wheat, TCL, and durum. I. Ortiz-Monasterio, K. Sayre, and J. Peña.

MPGM8801: Characterization of crop management by genotype interactions related to contrasting morphological plant types with emphasis on weed suppression. K. Sayre and I. Ortiz-Monasterio.

MPYP8802: Assessment of genetic progress for improvement in yield potential for bread wheat, durum wheat and triticale. K. Sayre, S. Rajaram, W. Pfeiffer, and O. Abdalla (H. Vivar when barley is periodically included).

?MPWS8901: Techniques for screening germplasm that can compete with weeds. I. Ortiz-Monasterio, B. Skovmand, and K. Sayre.

MPHT8901: Investigation of physiological basis of heat tolerance in international germplasm: International Heat Stress Genotype Experiment (IHSGE). M. Reynolds, E. Acevedo, and R.A. Fischer.

?MPYP8902: Investigation of response of CIMMYT BW varieties to reduced inter-plant competition for light and soil resources. M. Reynolds, E. Acevedo, and R.A. Fischer.

?MPDR8903: Investigation of responses of CIMMYT BW germplasm to different intensities of pre- and post-anthesis drought stress and a comparison between line source and gravity irrigation methodologies. M. Reynolds and K. Sayre.

MPHT9001: International Heat Stress Management Experiment (IHSME). M. Reynolds, E. Acevedo, and R.A. Fischer.

†MPPB9001: Physiology breeding for improved performance of durum wheat under drought stress. E. Acevedo, O. Abdalla, P. Monneveux, and M. Nachit.

MPGC9001: Selection of bread wheat genotypes for phosphorus use efficiency. I. Ortiz-Monasterio, M. van Ginkel, and K. Sayre.

†MPBW9102: Increasing drought resistance through selection for osmotic adjustment in wheat. E. Acevedo, S. Rajaram, M. van Ginkel, D. Hoisington, M. Khairallah, J. Crossa, P. Stefany, and V. Calixto.

†MPBW9101: Identification, assessment, and verification of early generation selection criteria to increase the efficiency of selection for yield potential in ME1. E. Acevedo, P. Stefany, S. Rajaram, M. van Ginkel, J. Crossa, R.A. Fischer, and V. Calixto.

Strategic Component Agronomy (7 Projects)

New Project

MPNE9201: Nitrogen rates and timing under different levels of initial soil nitrogen on bread wheat yield and quality. I. Ortiz-Monasterio, K. Sayre, and J. Peña.

Project Updates

*MPNE8901: Nitrogen management for more efficient use. I. Ortiz-Monasterio, K. Sayre, and J. Peña.

?MPPD9001: Planting date x density x cultivar. I. Ortiz-Monasterio and K. Sayre.

?MPMV9001: Study to assess the sensitivity of the CERES wheat model. M. Bell.

?MPMA9002: Pakistan planting date study. M. Bell and P.R. Hobbs.

MPGM9001: Plant canopy architecture studies with emphasis on row spacing and planting method. I. Ortiz-Monasterio, K. Sayre, and R.A. Fischer.

MPNE9001: Rates, timing, splitting, and sources of nitrogen on bread wheat yield and quality. I. Ortiz-Monasterio, K. Sayre, and J. Peña.

Strategic Cropping Systems Sustainability Research (7 Projects)

New Project

MPSM9201: Sustainability implications for wheat straw management for a ridge-till wheat-maize cropping system in ME1. K. Sayre and I. Ortiz-Monasterio--CIMMYT; A. Ortega and J. Uvalle--CIANO.

Project Updates

MPYP8701: Effect of soil management strategies on sustainability of maximum yields. K. Sayre, I. Ortiz-Monasterio, and X. Uvalle (CIANO).

†MPDD9001: On-farm research in the Yaqui Valley--diagnostic determination of yield limiting factors. E. Acevedo, C. Meisner, D. Byerlee, I. Ortiz-Monasterio, K. Sayre, A. Limon, and D. Flores.

?MPMA9001: Yield trends in the Yaqui Valley--variation due to climate and contribution due to inputs. M. Bell, R.A. Fischer, and D. Byerlee.

MPNE8904: Use of N fixing legume species as intercrops with wheat to improve productivity and nitrogen inputs at low soil fertility. M. Reynolds and K. Sayre.

***MPSM9001:** Wheat straw management alternatives in the wheat-soybean rotation. K. Sayre, I. Ortiz Monasterio, X. Uvalle (CIANO), and D. Lawn.

MPSM9102: Sustainable cropping in ME2: long-term rotation and tillage experiments in El Batan. R.A. Fischer, S. Roman, and V. Calixto.

Crop Management Training (3 Projects)

Project Updates

?MPYP8701: Factors limiting production at Chalco. M. Bell, H. Hepworth, and A. Limon.

?MPRE8801: Research efficiency: Change in precision associated with different levels of experimental variables. M. Bell, H.R. Lafitte, and R. Mead.

?MPYP9001: Assessment of optimum sample size and number for estimating yield of plot or field from crop cuts. M. Bell.

APPLIED MOLECULAR GENETICS (5 projects)

RFLP Mapping (4 projects)

New Project

AMGW9201: RFLP mapping of bacterial leaf streak resistance in wheat. D. Hoisington, E. Duveiller, M. van Ginkel, and S. Feingold.

Project Updates

AMGW9101: RFLP mapping of durable rust resistance genes/factors in bread wheat. D.A. Hoisington, R.P. Singh, and F. Acevedo.

AMGB9101: RFLP mapping of resistance genes for the Russian wheat aphid in barley. F. Dorregaray, D. Hoisington, and J. Robinson.

AMGB9102: RFLP mapping of the loci controlling osmotic adjustment in barley. D. Hoisington, E. Acevedo, and M. Khairallah.

Molecular Fingerprinting (1 project)

New Project

AMGP9201: Molecular fingerprinting of cereal aphids. J. Robinson, M. Fischer, and D. Hoisington.



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