

Nomenclature of CIMMYT germplasm

Fatima Camarillo-Castillo & Leonardo Crespo Herrera

f.camarillo@cigar.org

l.crespo@cigar.org

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Germplasm

- Crossing blocks. Directly dependent of the breeding objectives:
 - Advanced lines >F₄ lines
 - Elite adapted parents, e.g. Borlaug 100, Kachu, etc.
 - Landraces and products of interspecific hybridization in pre-breeding, “exotic” germplasm
 - To derived: F₁ SIMPLE, F₁ TOP/BC₁
- Segregating populations. F₂, F₃ & F₄
- Head-rows, F₄ & F₅
- Yield Trials (YT), Elite Yield Trials (EYT) and Advanced Yield Trials (AEYT)

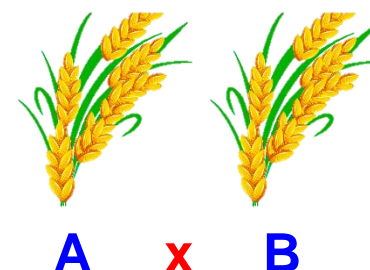


Cross breeding

- The ultimate goal is to combine and/or increase desirable traits into a single cultivar
- Generate “good” variability for selection

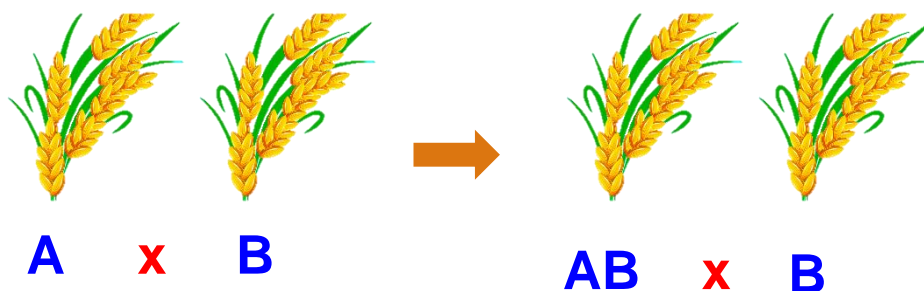
Simple cross

- Create new recombination of desirable genes- creation of a distinct genotype



Backcross

- Add genes from a source into an existing genotype



Top cross

- Incorporate one or more desired traits from a third parent



Main nomenclature of the breeding material

- CBS: Crossing Block Spring Wheat
- CBW: Crossing Block Winter Wheat
- ON: Observation nursery
- F₁, F₂, F₃, etc.: Filial Breeding Generation
- AL: Advanced Lines bulked in F₅ or F₆
- PC: Small plot (Parcela Chica in Spanish) of advanced lines bulked
- EAL: Elite Advanced Lines that have been promoted based on PYT performance
- EPC: Elite PC or elite advanced lines that have entered replicated yield trials (YT), following acceptable performance in the PYTs and EALs.



Pedigree format / simple cross

- A standardized recording system is used for crosses

$A * B \rightarrow F_1$ A / B

$F_1 * C$ $A / B // C$

$A / B // C$



- Subsequent crosses with parental material D, E, F and G

$A / B // C / 3 / D / 4 / E / 5 / F / 6 / G$



The female is designed by listing it first (on the left), followed pollen parent (on the right):

A / B // C / 3 / D / 4 / E / 5 / F / 6 / G



Example #1

G/6/E/4/C//A/B/3/D/5/F

G /6/ E/4/C//A/B/3/D/5/F

6th cross: G and the product of E/4/C//A/B/3/D/5/F

E/4/C//A/B/3/D /5/ F

5th cross: the product of E/4/C//A/B/3/D and the product of F

E /4/ C//A/B/3/D

4th cross: the product of C//A/B/3/D and E

C//A/B/ 3 /D

3rd cross: the product of C//A/B and D

C // A/B

2nd cross: C and A/B

A/B

1st cross: A and B



Letters were used in the previous example to define the cultivar, in this example the pedigree is broken down with the names of cultivars:

Example #2

Waxwing / PVN 

Waxwing / PVN // Kiritati 

Kiritati // Waxwing / PVN



Waxwing / PVN // Kiritati / Kingbird

Waxwing / PVN // Kiritati /3/ Kingbird /3/

Waxwing / PVN // Kiritati /3/ Kingbird /4/
INIA 66 / 5 / PVN

Waxwing / PVN // Kiritati /3/ Kingbird /4/
INIA 66 / 5 / PVN / Kingbird



Pedigree format / backcross

- Backcrosses are designed with an asterisk (*) and a number indicating the dosage of the recurrent parent:

A is the recurrent parent: A^*2/B

B is the recurrent parent: $A/3^*B$

A/B is the recurrent parent: $A/B^*4//C/D$

C/D is the recurrent parent: $A/B//5^*C/D$



The asterisk and the number are placed next to the crossing symbol that divides the recurrent and donor parents

Example #3

PVN *2 / INIA66

PVN is the recurrent parent

PVN / 2* INIA66

INIA66 is the recurrent parent

Example #4

INQALAB91 / KUKUNA

INQALAB91 *2 / KUKUNA

INQALAB91 / 2* KUKUNA



Selection history codes

Selection history records the process of selection: how and where selection was made and the stage or generation of selection.

- Every F1, segregating line or advance line in the program is assigned a so-called CROSS ID (CID)

1- Origin of the cross

2- Growth habit (optional)

3- Abbreviation for the year

4- Location

5- Sequential number to identify the individual

6- Type of cross

CM SS 97 Y 01001 S



Origin of the cross

- **CM** = Bread wheat (Cruza Mexicana)
- **CD** = Durum wheat
- **CT** = Triticale
- **CG** = Cruza genetica (genetic cross)
- **CMH** = Pre-breeding program
- **CIG** = Cruza Inter-generic = wide-crosses
- **CMSA** = Semi-Arid Program
- **PT** = Physiological trait



Location

- **B** = El Batan
- **M** = Toluca
- **ZTM** = Zero tillage Toluca
- **Y** = Yaqui

Type of cross

- **T** = Top or BC
- **S** = Simple
- Top or BC- added in the selection history



Codes for the selection methods

- **0Y & 0M** = Populations harvested in bulk
- **05, 010** = modified bulk selection method, 5 or 10 spikes harvested
- **0Y** = Unselected bulk
- **099Y or 099M** = Selected bulk (unknown number)
- **1M, 2M, 3M....** = Selection of individual heads. Each head will be a small plot, parcela chica (PC)



WBLL1/FRET2//PASTOR*2/3/MURGA/5/ND643//2*ATTILA*2/PASTOR/
3/WBLL1*

Type of cross	F1	F2	F3	F4	F5
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CMSS11B00211S	099M	099NJ	099NJ	<u>4WGY</u>	0B
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The 4th spike

BECARD/AKURI*2/3/PBW343*2/KUKUNA*2//FRTL/PIFED

Type of cross	F1	F2	F3	F4	F5	F6
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CMSS11Y01036T	099TOPM	099Y	099M	0SY	<u>26M</u>	0WGY
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The 26th spike



Names of wheat cultivars

Bread Wheat

Land birds: Kingbird, BlueBird, BlueJay

Durum Wheat

Water birds: Albatros, Sterna, Gaviota

Triticale

Mammals: Zebra, Bull, Azno, Giraffe



Example #5

BORL14//KFA/2*KACHU

CMSS11B00167S-099M-099NJ-099NJ-25WGY-0B

Example #6

KFA/2*KACHU/4/WBLL1*2/KURUKU//KRONSTADF2004/3/
WBLL1*2/BRAMBLING

CMSS11Y00424S-099Y-099M-099NJ-099NJ-31RGY-0B

