

# Wheat Materials from Irrigated Bread Wheat Improvement Program

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# Core Breeding Priorities-Irrigated Bread Wheat Improvement Program

- **Enhancing the rate of genetic gains in yield potential**
- **Grain yield potential and yield stability**
- **Durable resistance to rusts and other diseases**
- **Water use efficiency/drought tolerance**
- **Heat tolerance**
- **End use quality including grain size**

# Yield testing of advanced lines at Cd. Obregon, Mexico

- **1<sup>st</sup> year yield trials (2500 entries): 3 reps, alpha-lattice design**
  - ▶ raised bed 5-irrigations
- **2<sup>nd</sup> year yield trials (400 entries): 3 reps, alpha-lattice design**
  - ▶ Raised bed-5 irrigations (>8 t/ha)
  - ▶ Flat-5 irrigations (>8 t/ha)
  - ▶ Raised bed-2 irrigations (4-5 t/ha)
  - ▶ Raised bed- drip irrigation (2-3 t/ha)
  - ▶ Raised bed-Late (85 days delay) sown- (4-5 t/ha)

# Characterization of advanced lines

- Diseases:
  - ▶ Leaf rust- seedling and field (El Batan and Cd. Obregon)
  - ▶ Yellow rust- seedling and field (Toluca and Ecuador)
  - ▶ Stem rust- seedling and field: off- and main-seasons (Kenya)
  - ▶ Septoria tritici- Toluca
  - ▶ Fusarium- El Batan
  - ▶ Tan (yellow) spot- El Batan greenhouse (started in 2008)
  - ▶ Stagnospora nodorum blotch- El Batan greenhouse (started in 2008)
  - ▶ Spot blotch- Aguas Frias (started in 2008)
- Various quality traits including grain weight
- Agronomic traits: height, heading, maturity, lodging

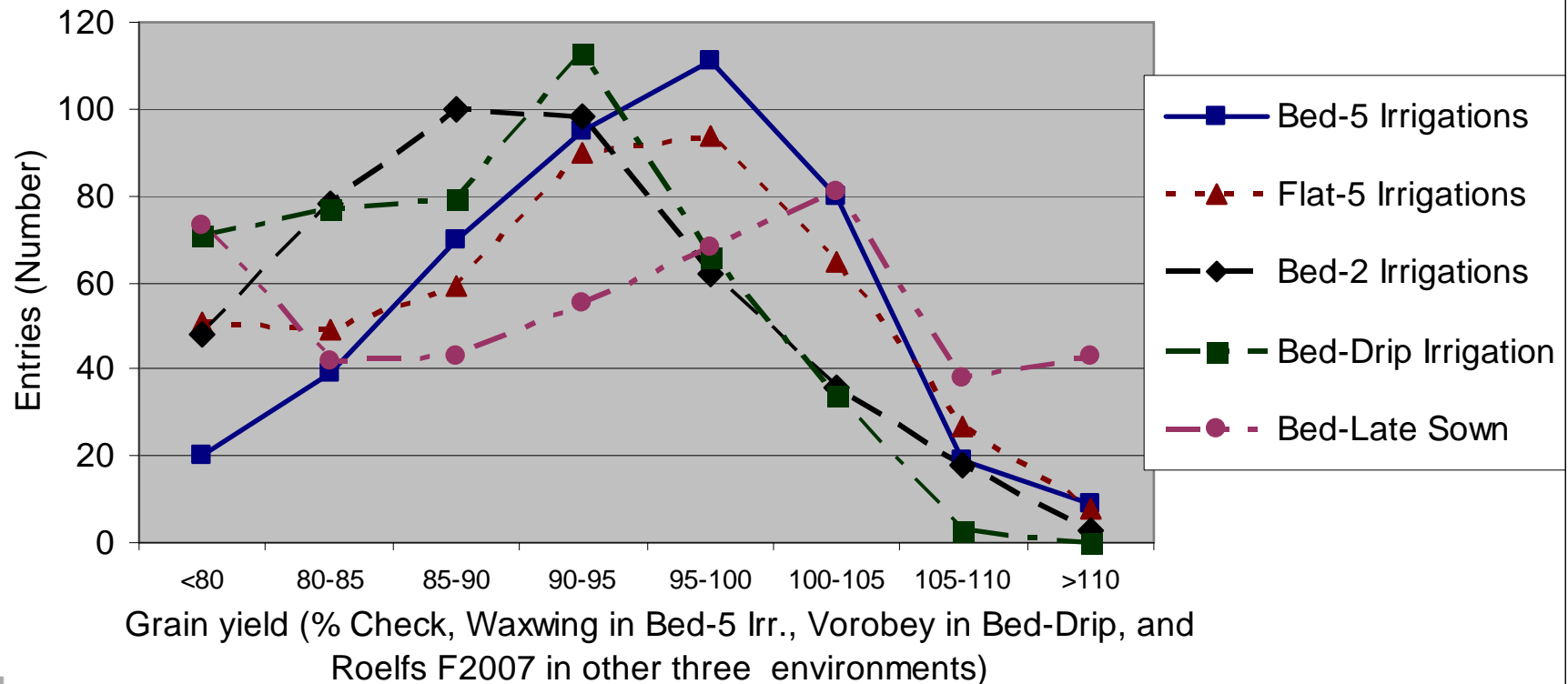
# Update on M30 ESWYT and M42 IBWSN provided in 2007

- The international nurseries 30<sup>th</sup>ESWYT and 42<sup>nd</sup>IBWSN formed in Mexico and lists provided to Australia.
- Yield data from 5 environments in Mexico, various disease, agronomic and end-use quality data provided.
- Some highlights of materials:
  - ▶ Several lines had good performance in drip induced dry conditions and late sown heat stress environments.
  - ▶ End-use bread making quality of >50% lines excellent when grain came from <5 t/ha yield environments.
  - ▶ 60% lines included in 30<sup>th</sup>ESWYT had at least moderate resistance to Ug99.

# Update on M30 ESWYT and M42 IBWSN provided in 2007

*(Note: several lines selected for high yield in irrigated environment maintained high yield in drought and heat stressed environments)*

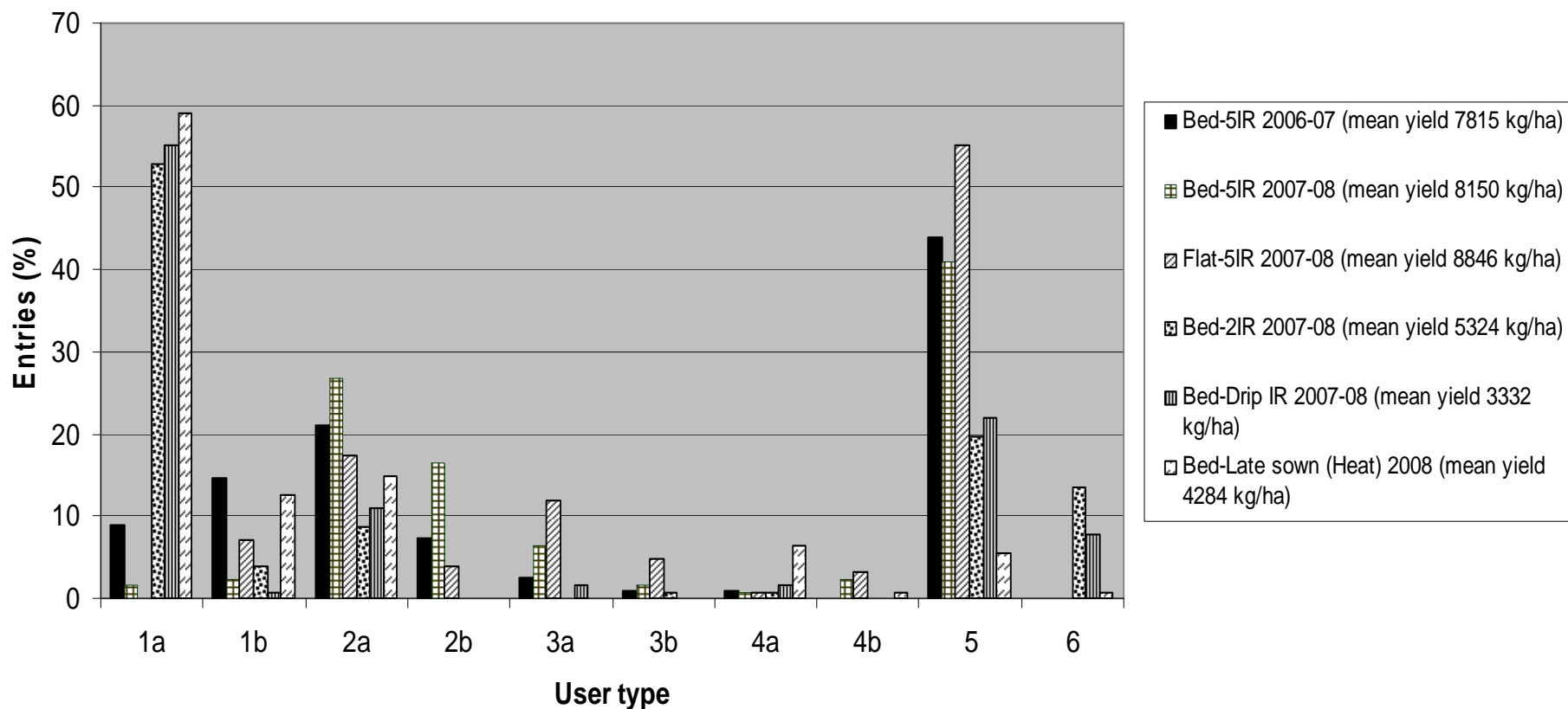
**Grain yield performance of 443 M30 ESWYT & M42 IBWSN bread wheat lines in five environments, Ciudad Obregon 2007-2008**



# Update on M30 ESWYT and M42 IBWSN provided in 2007

*(Note: >50% lines had quality type 1a, i.e. strong gluten strength with excellent extensibility and high protein content)*

End-use quality of 127 bread wheats grown under six environments, Cd. Obregon  
2006-2007 and 2007-2008



# Update on resistance to rusts in M31ESWYT sent in 2008

- **100 entries including checks**

- **Leaf rust:**

APR (near-immune level) : 59 entries

*Lr16*+APR : 15

*Lr19* (white floured) : 10

*Lr42* : 4

Uncharacterized genes : 11

- **Stem rust:**

APR (moderate level) : 60

*Sr25* : 10

*SrTmp* : 5

Unknown genes : 3

- **Yellow rust:**

APR (high to moderate) : 80

Race-specific genes : 19