Development of $Pgt$ race Ug99 resistant wheat cultivars in Iran: achievements and prospects

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• **Wheat area**: 6.5 mha, 2.4 irrigated, 4.1 rain fed.
• **Production**: 12-15 m tons depending on the drought/humidity of the season

• **Among rusts, Yellow rust** >> more prevalent especially in humid seasons

• **Up to 1.5 million tons wheat grain loss in 1993** (Torabi, et al. 1995).

• **Development of new cultivars specially in irrigated wheat** >>> some how controlled.

• **Leaf and stem rust** potential threats especially in northern Caspian sea shore where humidity and temperature are favorable.
History of stem rust in Iran:

1947: The First Report of wheat SR in Iran

1966-68: Reported from North of Iran

1976: Epidemic of SR in South of Iran

2007: *Sr31*-virulence in Iran (Nazari et al. 2008)

• Since then, no considerable stem rust has been observed/reported, but considered as an important challenge for ongoing wheat breeding programs.
• Evaluation of circulating germplasm to this new virulence, where disease was prevalent

• This opportunity provided through BGRI formation and CIMMYT support and Kenyan ARI (KARI)

• Evaluation of germplasm in Kenya for APR against Ug99 virulence from 2007 onward

• Seedling assessment: In green house inside the country
Status of Iranian evaluated wheat germplasm in Kenya from 2007 till 2012
Ug99-resistant wheat varieties released or in advanced tests

**Iran**
- Akbari **
- Arg **
- Bam **
- Gonbad **
- Moravid *
- Parsi **
- Pisgham **
- Sirvan *
- Sistan **
- Ofogh **

**Afghanistan**
- Koshan 09 *
- Muqawim 09 *
- Chonte#1 *
- Baghlan 09 *

**Pakistan**
- NARC2011 *
- Lasani 08 **

**Nepal**
- BL3063 **
- Francolin#1 *
- Danphe#1 *

**Bangladesh**
- BARI Gom 27 *
- BARI Gom 26 **

**Egypt**
- Misr 1 *
- Misr 2 *

**Ethiopia**
- Digalu *
- Danda’a *
- Kakaba *
- Gambo *
- Hidase *
- Ogolcho *
- Hoggana ***
- Shorima ***
- Hulluka ***

**Kenya**
- Eagle 10 *
- Robin *
- Kenya Tai *
- Kenya Sunbird *
- Kenya Wren *

**India**
- Super 152 *
- Super 172 *
- Baj *

* Materials from CIMMYT breeding program
** Materials from National Programs
*** Materials from ICARDA breeding program

Source: BGRI, John Bakum personal communications

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• A national stem rust management research program

• Hybridization and gene pyramiding strategy.

• The first generation of breeding lines developed from crosses of Parsi, Sivand and Morvarid

• Molecular tracking of the genes is also under progress to characterize resistant varieties.

• Pathological evaluations: pathotype identification, trap nursery monitoring, seedling and adult plant resistance evaluations in green house
• Other concerning challenges:
  • Low investment of government, no private sector
  • Complication of drought and moisture stress cycles >> affecting the goals
  • Adoption of new varieties >> farmers will, Attila and Sardari

• Variation in virulence for Yr in different corners of the country, complicated epidemiology
• Neighboring countries epidemics and inoculums transfer >>

• Using of rich genetic resources >> lack of an effective pre-breeding program
THANK YOU

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