



Wheat Variety MACS 6478

Why in News

The **wheat variety** called **MACS 6478** has **doubled the crop yield** for farmers in Karanjkhop, a village in Maharashtra.

Key Points

- **Developed By:** Scientists from **Agharkar Research Institute (ARI), Pune**- an autonomous institute of the Department of Science and Technology (DST).
 - A **common wheat or bread wheat** (*Triticum aestivum*).
 - Other popular wheat varieties are **durum wheat** (*T. durum*) and **club wheat** (*T. compactum*).
 - **Hybrid Crop**, i.e. produced by the cross-breeding of two genetically different varieties or species. Hybrids are often spontaneously and randomly created in nature when open-pollinated plants naturally cross-pollinate with other related varieties (not genetically modified).
 - **Matures in 110 days** and is **resistant to** most races of **leaf and stem rust**.
 - This is **against the normal maturing attained after 140 to 150 days**, required for wheat varieties cultivated commonly in northern India.
 - This **amber colored medium sized grain** contains **14% protein, 44.1 ppm (parts per million) zinc** and **42.8 ppm iron** which is higher than other cultivated varieties.
 - Farmers get a **yield of 45-60 quintal per hectare** with the new variety as against earlier average yield ranging 25-30 quintal per hectare when they cultivated Lok 1, HD 2189 and other old varieties.
- **Other ARI Wheat Variety (MACS 4028):**
- **Features:** This **bio-fortified durum variety** has very high protein (14.7%), iron (46.1 ppm) and zinc (40.3 ppm) content, compared to the corresponding levels of 8-10%, 28-32 ppm and 30-32 ppm in normally-grown varieties.
 - **Biofortification** is the process by which the nutritional quality of food crops is improved through agronomic practices, conventional plant breeding, or modern biotechnology.
 - Maturing in just over **100 days**, it is **suitable for cultivation in rainfed and low fertility conditions in Maharashtra and Karnataka**.
 - It was **chosen for a UNICEF-funded Farming System for Nutrition project**, operated through the [Indian Council of Agricultural Research's \(ICAR\) Krishi Vigyan Kendras \(KVK\)](#), as part of the [National Nutrition Strategy](#).
- ARI has also bred **MACS 2971**, a high-yielding variety of the traditionally cultivated dicoccum (also known as 'khopli') wheat that is rich in dietary fibre.
- The [Karan Vandana](#) (DBW 187) wheat variety, developed by the **Indian Institute of Wheat and Barley Research (IIWBR)** under the **Indian Council of Agricultural Research (ICAR)**, is

used for cultivation in North Eastern Plains Zones.

Other Recent Activities by ARI

- Found the [first synthetic route for producing flavonoids molecules](#) related to the treatment of tuberculosis and chikungunya.
- Found that the [colour of Lonar lake water](#) in Maharashtra's Buldhana district turned pink due to a large presence of the **salt-loving 'Haloarchaea' microbes.**
- [Mapped two alternative dwarfing genes Rht14 and Rht18](#) in wheat that can help in reducing rice crop residue burning i.e. stubble burning.
- Isolated and cultivated [45 different strains of methanotrophs](#) (methane-utilising bacteria) and created the first indigenous methanotroph culture.
- A [study on biogenic methane hydrate in the Krishna-Godavari \(KG\) Basin.](#)

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