



Solution # 3:

Multi-purpose climate-smart Barley for food/malt, feed, and fodder

Submitter: (ICARDA)

Solution Overview

Climate-smart multi-purpose barley varieties developed using ICARDA's germplasm are for food/malt, feed, and fodder purposes. These multi-purpose varieties showcase remarkable advantages over checks. They exhibited a striking increase of 48% in grain production and 38% in straw yield. This heightened straw production not only contributes to the crop's resilience but also enhances the sustainability of crop-livestock farming systems. Furthermore, the premium price of 20% for malt barley grain adds significant value to cultivation. With a notable 44% increase in income per hectare, derived mainly from grain (29%) and straw (15%), these versatile barley varieties offer promising economic prospects for farmers. ICARDA's elite naked barley genotypes have demonstrated a yield advantage of over 50% over the hulled check Rihane-03, effectively overcoming the traditional yield penalty of hulless barley over hulled barley.

Among these innovations is the recently released hulless variety DWRB223, developed from ICARDA germplasm, which is high-yielding and tolerant to rust. Others are: India- PL891 (Hulless) DWRB 137, RD 2715, RD 2794; INRA 1794, 1796 (Morocco), Woleshe (Ethiopia); Tahir, Hudeiba (Sudan); Ay, Guldeste (Turkey); Pearl 21, Jau 21, JE 21 (Pakistan)

These significant improvements make multipurpose barley appealing for rapid adoption by farmers.

Key Features & Benefits:

- Multi-purpose; Suitable for food, malt production, animal feed, and fodder.
- High Yielding reported 48% increase in grain yield and 38% more straw compared to conventional varieties.
- Economic advantage due to 20% premium price for malt barley and a 44% increase in income per hectare.
- Enhanced tolerance to climate stresses, supporting sustainable crop-livestock integration.
- Hulless barley, offering >50% yield advantage over hulled check Rihane-03.

Where It Works and Where It Can Work

Existing and potential target regions: Suitable for arid and semi-arid regions. India (North-western plane zones), Nepal, Pakistan, Ethiopia, Uganda, Tunisia, Morocco, Lebanon, Syria, Iran, Turkey, and China.

Evidence & Impact

What results has it shown? Stats, pilot outcomes, or testimonials.

These climate-smart barley varieties have reported up to 48% higher grain yield and 38% more straw yield compared to conventional varieties. This productivity boost translates directly into economic benefits for farmers, who report a 44% increase in income per hectare, with 29% of this increase coming from grain and 15% from straw. Varieties with premium malt production enabled farmers to access markets, where malt barley fetches a 20% higher price than other types, further enhancing overall profitability.

Scalability & Adoption Support

These improved barley varieties have demonstrated strong performance across diverse target agroecologies, confirming their significant potential for large-scale adoption. Their success is rooted in key attributes that make them cost-effective to produce and manage while also enabling them to thrive in a wide range of challenging environments, including poor soils with low input and marginal lands.

Adoption needs an effective public-private partnership, capacity-building support, quality seed production, value chain development, and sustainable market linkages.

Partners & Contact Info

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