



## Solution # 4:

### Climate-smart DURUM wheat (Kathia Gehu)

Submitter: (ICARDA)

#### Solution Overview

ICARDA's durum wheat lines are tolerant to extreme drought and heat stress, performing well under restricted irrigation (1 to 2), and achieving yields of up to 3.5 tonnes per hectare. These varieties can double the farmers' income in dry areas, such as the Bundelkhand region of Uttar Pradesh and Madhya Pradesh in India. The UP Government has declared durum wheat in the Banda district of UP as part of its 'One District One Product' initiative. Moreover, these varieties boast high nutritional value, being rich in protein, vitamins A, B, and E, beta-carotene, iron, zinc, copper, calcium, phosphorus, selenium, and high fiber content, rendering them highly desirable for both agricultural productivity and human nutrition. Recently released promising varieties include Kareem (Iran); Margherita, Zagharin 2 (Lebanon and Ethiopia); Rabbal (Jordan), and others.

#### Features & Benefits

- Drought & heat tolerance with high yields under restricted irrigation.
- High Yield Potential with up to 3.5 tonnes/ha (RI).
- Superior grain quality with high gluten strength for pasta making and other value-added products
- Food and nutritional security; Rich in protein, vitamins (A, B, E), beta-carotene, iron, zinc, copper, calcium, phosphorus, selenium, and dietary fiber.

#### Where It Works and Where It Can Work

Suitable for arid and semi-arid regions. Existing and potential target regions include India, Pakistan, Morocco, Ethiopia, Lebanon, Iran, Jordan, Turkey, Mauritania, Senegal, and Kazakhstan.

#### Evidence & Impact

Varieties developed using ICARDA's germplasm have demonstrated significant advantages, yielding 20–30% higher grain yields (up to 6 tonnes/ha under irrigation and 3.5 tonnes/ha in rainfed conditions) and exhibiting better quality compared to conventional varieties across the target agroecologies. Farmers in dry areas have reported that their incomes have doubled after switching to these varieties. In India, they are already making an impact in dry and drought-prone regions; the Uttar Pradesh (UP) Government has declared durum wheat in the Banda district of UP as part of its 'One District One Product' initiative. They are widely adopted in other countries such as Morocco, Lebanon, Iran, Jordan, etc.

#### Scalability & Adoption Support

Durum wheat yields 5% more than bread wheat under restricted irrigation conditions, providing a sustainable income to farmers in dry areas. These varieties are climate resilient and adaptable, making them suitable for large-scale adoption.

To accelerate adoption, continued investment in capacity building, quality seed multiplication, farmer training, and extension services is needed, along with partnerships to strengthen value chains and market access.

#### Partners & Contact Info

**Partner:** NARS-ICAR-Indian Institute of Wheat and Barley Research, Karnal.

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