



Market Intelligence Digest

Millet | Burkina Faso

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Market Intelligence
Area of Work

The CGIAR Market Intelligence Area of Work aims to maximize the impact and return on investment of breeding programs by integrating market insights, behavioral intelligence, and strategic prioritization. It identifies high-impact opportunities, guides product development, and enhances product adoption and lifecycle management through decision-support tools.

ENGLISH VERSION

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A. Market Segments

	Harvested area (ha)	% of Total harvested area
Total Area Covered by Seed Product Market Segment (Active only)	1,046,273	100
<u>Millet Pearl WAF MS00641</u>		
Millet - Pearl Non-Hybrid WAF Food; Home Consumption; Processing Greyish; Cream Sahelian Zone Rainfed Early	659,152	63
<u>Millet Pearl WAF MS00643</u>		
Millet - Pearl Non-Hybrid WAF Food; Home Consumption; Processing Greyish; Cream Sudanian Zone Rainfed Mid	313,882	30
<u>Millet Pearl WAF MS00644</u>		
Millet - Pearl Hybrid WAF Food; Home Consumption; Processing Greyish; Cream Sudanian Zone Rainfed Mid	62,776	6
<u>Millet Pearl WAF MS00642</u>		
Millet - Pearl Hybrid WAF Food; Home Consumption; Processing Greyish; Cream Sahelian Zone Rainfed Early	10,463	1
National Harvested Area (ha) (FAOSTAT)	1,046,272	
Difference between market-segmented area and national harvested area	-1	0

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B. Market Segment Criteria

MS Criteria	Value	Harvested area (ha)	% of Total harvested area
Crop	Millet	1,046,273	100
Subregion	West Africa	1,046,273	100
Material Type	Non-Hybrid	973,034	92
	Hybrid	73,239	8
Consumer Product Type	Food; Home Consumption; Processing	1,046,273	100
Color	Cream; Greyish	1,046,273	100
Production Environment	Sahelian Zone	669,615	60
	Sudanian Zone	376,658	40
Production System	Rainfed	1,046,273	100
Maturity	Early	669,615	60
	Mid	376,658	40

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C. Target Product Profiles and Breeding Pipelines

Seed Product Market Segment	Target Product Profile	Breeding Pipeline	Breeding Effort
<u>Millet Pearl WAF MS00641</u>	<u>Millet Pearl WAF CIMMYT TPP00319</u>	Millet Pearl CIMMYT BP00139	Category 1: Full
	<u>Millet Pearl WAF ICRISAT TPP00429</u>	Millet Pearl ICRISAT BP00168	Category 1: Full
<u>Millet Pearl WAF MS00642</u>	<u>Millet Pearl WAF CIMMYT TPP00331</u>	Millet Pearl CIMMYT BP00141	Category 4: Late Testing
<u>Millet Pearl WAF MS00643</u>	<u>Millet Pearl WAF CIMMYT TPP00329</u>	Millet Pearl CIMMYT BP00140	Category 1: Full
	<u>Millet Pearl WAF ICRISAT TPP00430</u>	Millet Pearl ICRISAT BP00169	Category 1: Full
<u>Millet Pearl WAF MS00644</u>	<u>Millet Pearl WAF CIMMYT TPP00330</u>	Millet Pearl CIMMYT BP00141	Category 1: Full
	<u>Millet Pearl WAF ICRISAT TPP00431</u>	Millet Pearl ICRISAT BP00170	Category 1: Full

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D. Mapping Traits from TPPs and MI Evidence to Value Propositions

Value Proposition	Essential improved traits from 7 TPPs*	Key traits from MI Evidence
01 Farmer • Higher Productivity	- Grain Yield (7) - Panicle length (3)	High Grain Yield
02 Farmer • Higher fodder yield or value	Fresh Biomass (1)	Dual-purpose Biomass
03 Farmer • Less Loss & Risk: CC relevant stress	No essential traits to be improved	- Drought Tolerance - Yield Stability under Low-Input Conditions
04 Farmer • Less Loss & Risk: Biotic stress	- Downy Mildew Resistance (7) - Striga resistance (2)	- Downy Mildew Resistance - Striga Resistance/Tolerance
08 Farmer • Less labour	No essential traits to be improved	Non-bristle Panicle
09 Farmer • Appropriate maturity	Maturity (2)	Early/Extra-early Maturity
10 Farmer/user • Longer storage life	No essential traits to be improved	- Low Lipase Activity - Low Fat Content
11 User • Less labour	No essential traits to be improved	- Dehulling Efficiency - Moderate Grain Hardness - High Food/Flour Yield
12 User • Meeting end-user requirements	Iron, Fe (3)	- Organoleptic Quality (Taste) - Large Grain Size - Light Grain Color - Swelling Capacity
13 User • Better nutrition and/or health	No essential traits to be improved	- High Grain Iron and Zinc - Low Antinutritional Factors

* Values in parentheses () reflect the frequency of appearance of each essential improved trait across the active TPPs.

See **Section E** for reference

Note: "Essential: Maintain" and "Nice-to-Have" traits of TPPs are not included in the table

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D. Mapping Traits from TPPs and MI Evidence to Value Propositions

List of Value Propositions

- **01 Farmer • Higher Productivity:** More yield in a representative target environment.
- **02 Farmer • Higher fodder yield or value:** More fodder: yield and quality (like digestibility)
- **03 Farmer • Less Loss & Risk: CC relevant stress:** Avoided yield losses and more production stability in the face of climate change-relevant shocks and stresses such as drought, excess water (excessive rains, waterlogging, submergence, typhoons), heat, and salinity
- **04 Farmer • Less Loss & Risk: Biotic stress:** More production where and when this pest or disease occurs.
- **05 Farmer • Less Loss @ Location:** Crop production in less favorable environmental conditions, such as cold, acidity, alkalinity, shade, salinity, iron toxicity.
- **06 Farmer • Less Loss – Other:** Less loss in the field due to shattering or lodging.
- **07 Farmer • Greater fertilizer use efficiency:** Less need for fertilizer, more production at low levels of fertilizer, biological nitrification inhibition (BNI).
- **08 Farmer • Less labour:** Ability to mechanize. Less work and drudgery for weeding, harvesting and on-farm sorting.
- **09 Farmer • Appropriate maturity:** Better fit in the cropping system. Varieties that may induce early maturity or prolong the time it takes to harvest the crop.
- **10 Farmer/user • Longer storage life:** Longer storage with fewer losses. Other avoided losses due to processing?
- **11 User • Less labour:** Less labour for home processing (peeling/shelling ability (incl. shape), cooking time).
- **12 User • Meeting end-user requirements:** Product meets market intermediaries/end-use requirements in critical aspects. Physiological improvements that focus on standards/qualities of formal markets (e.g. color, size, texture, protein)
- **13 User • Better nutrition and/or health:** More nutritional and/or healthier product regarding protein, fiber, iron, zinc, beta-carotene and toxins. When combined with awareness raising and nutrition education, results in higher (induced) demand.
- **14 Multiplier – Easier to multiply:** Lower costs to multiplier; greater seed availability to farmers.
- **15 Other:** Undefined value to farmer, end user, or multiplier

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E. Synthesis of evidence highlighting key traits by thematic area

Overview (Pearl Millet)

Pearl millet is the foundational staple for food security in Burkina Faso, yet its potential is severely constrained by a fragmented seed system and a lack of formal quality controls, which exacerbate inherent trait gaps. The vast majority of farmers rely on informal seed networks, making recognizable morphological markers essential for maintaining variety identity in the absence of institutional labeling. While there is a widespread demand for high-yielding, drought-tolerant varieties that can withstand intensifying climatic shifts, the lack of infrastructure for grain storage and the absence of credit facilities for smallholders limit market expansion. Furthermore, the rapid development of off-flavors in flour remains a dominant barrier for urban processors, a technical hurdle that is compounded by poor road connectivity and high shipping costs. Addressing these systemic failures alongside breeding for consumer-preferred sensory qualities and gender-responsive labor reduction is critical to transforming the pearl millet value chain into a resilient and commercially viable sector

1. Consumers

- **Food Consistency:** This trait is the most cited preference because it determines the structural integrity of "tô," the nation's primary staple dish.
- **Organoleptic Quality (Taste):** Good taste is essential for broad family acceptance, and varieties failing this sensory standard face absolute market rejection.
- **Large Grain Size:** Consumers and traders prioritize larger grains as a visual proxy for high quality and superior grain yield potential.
- **Light Grain Color:** There is an overwhelming aesthetic preference for white or grey flour, as darker grains produce less marketable food products.
- **High Grain Iron and Zinc:** Targeted biofortification is required to alleviate "hidden hunger" and micronutrient deficiencies in children and pregnant women.

2. Processors

- **Dehulling Efficiency:** This enables mechanical decorticators to separate the bran from the endosperm efficiently without incurring significant grain loss.
- **Moderate Grain Hardness:** Grains must not be excessively hard to ensure they do not require prohibitive soaking and cooking times for home processors.
- **Low Antinutritional Factors:** Reducing phytates and tannins is necessary to prevent chemical interference with mineral absorption and the human enzymatic system.
- **Low Lipase Activity:** Minimizing enzymatic activity prevents the development of bitter, "mousy" scents in flour, which currently limits its shelf life to a brief window.
- **Swelling Capacity:** This technical property is required to achieve the desired volume and texture for traditional processed products like gruel.

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E. Synthesis of evidence highlighting key traits by thematic area

3. Producers

- **High Grain Yield:** Increasing absolute productivity is the primary driver for farmers seeking to maximize caloric output on marginal lands.
- **Drought Tolerance:** This trait is vital for ensuring a minimum harvest in the face of unpredictable rainfall onset and intermittent dry spells.
- **Early/Extra-early Maturity:** Short-duration varieties allow the crop to escape terminal drought by aligning the cycle with the brief Sahelian rainy seasons.
- **Dual-purpose Biomass:** High fodder yield is indispensable for integrated crop-livestock systems that rely on millet stover for animal feed during the dry season.
- **Downy Mildew Resistance:** Genetic protection is required to mitigate the impact of the most widespread and prioritized disease in the country.

4. Gender & Social Inclusion

- **Non-bristle Panicle:** This trait directly reduces physical irritation and the time-intensive labor required for women during manual harvesting and threshing.
- **Striga Resistance/Tolerance:** Mitigating parasitic witchweed reduces the extreme manual weeding labor burden placed on women who often manage the most infested fields.
- **High Food/Flour Yield:** Women specifically value "food yield"—the volume of flour produced per unit of grain—due to their specialized knowledge of household processing.
- **Yield Stability under Low-Input Conditions:** Reliable performance on poor soils is critical for female farmers who often lack access to commercial fertilizers and irrigation.
- **Low Fat Content:** Lower lipid levels are a strategic requirement for female entrepreneurs who need stable flour to sell in urban value-added markets.

5. Enabling Environment

- **Morphological Distinctness:** Recognizable markers are required to support the informal seed system, where identification relies on visual exchange rather than formal labeling.
- **Flowering Synchrony:** High synchrony between parent lines is a technical prerequisite for local seed companies to produce hybrid seeds with lower financial risk.
- **Seed Longevity:** Better seed viability under household storage conditions helps overcome the widespread gaps in formal seed distribution and regulatory oversight.
- **Storage Infrastructure:** Institutional investment in metal silos and reinforced storage is needed to minimize post-harvest losses from rodents and pests.
- **Credit and Price Support:** Policy interventions such as "floor prices" are necessary to mitigate risk aversion among smallholders facing high market price volatility.

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E. Synthesis of evidence highlighting key traits by thematic area

References

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Annex 1. Insights from Market Intelligence Publications

No data available

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Annex 2: Requests for MI Evidence from PDT Meetings

MI Researchable Questions	Value Chain	Regional Crop Network	CGIAR coordinating Center	Network Priority
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No data available

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Annex 3: Definitions of commonly-used terms

Terms	Description
Market Segment or Seed Product Market Segment (SPMS)	A group of farmers with common product needs, driven by consumer and processor requirements (what) combined with a set of farmer requirements based on where and how the product is grown.
Market Segment Criteria	The eight criteria used to identify and define a market segment. Not all market segments will require all criteria to be identified e.g. maturity is not relevant for perennial crops. Non-applicable terms are captured as NA. To begin with, Market Segments were captured at the subregional level. • Crop: A crop in the CGIAR crop breeding portfolio. What entails a crop (as compared to a germplasm type) follows the convention what FAO defines to be a crop, so interoperability with FAO data sets can be ensured. Germplasm Type are used for subspecies (e.g. Plantain and Banana, Durum and Bread (wheat) or other types of consistent subgroupings of crops between which crosses are rarely made (winter wheat, spring wheat). It is the crop's assessment whether and how they want to use this attribute. • Subregion: Subregion(s) and countries on where the crop is grown (MS subregions derived from the seven regions recognized by CGIAR). • Material Type: Hybrid or non-Hybrid • Consumer Product Type: The processor and consumer requirements for a product, how they choose to process the product. • Color: Color of the grain or flesh of the product required by a market segment. • Production Environment (Agroecological Zone): Geographical areas exhibiting similar climatic conditions that determine their ability to support agriculture, typically defined by their geography, humidity and elevation. • Production System: How the crop is grown • Maturity: Maturity of the crop required where the crop is grown.

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Annex 3: Definitions of commonly-used terms

Terms	Description
Target Product Profiles (TPPs)	Defined to understand what essential (and nice-to-have) traits are required in a new product to meet or exceed the needs of farmers, processors and consumers in one particular crop market segment.
Breeding Effort	The extent of effort put on closely related Target Product Profiles (TPPs) that derive from one Breeding Pipeline = crossing block • Category 1: Full: The TPP which is the main target of the breeding effort (= for which most resources are available) is called Category 1 TPP. The Category 1 TPP Essential Trait requirements define the crossing block, and the extraction of candidates for early stage testing, late stage testing and on-farm verification. A Breeding Pipeline can only have one Category 1 TPP. The other TPPs that derive from the same population improvement effort, are assigned Category 2, 3 or 4. • Category 2: Early and Late Testing: This category has a separate variety selection effort that selects different candidates from early stage testing, before proceeding to late stage testing and on-farm verification. This is typically the case when CGIAR breeding programs send the same set of lines, clones or hybrids for early testing to partners and these partners select (and/or extract in the case of segregating lines) different TPPs out of the materials received.. • Category 3: Backcrossing: This category differs from Category 1 by one or two simply inherited Essential Improve Trait(s) that can be achieved through backcrossing. • Category 4: Late Testing: This category has a separate variety selection effort that selects different candidates from late-stage testing, before proceeding to on-farm verification. • Category 5: None: This category is for Market Segments with no TPP defined or no TPP linked to a CGIAR Breeding Pipeline
Breeding Pipeline	The sum of the breeding efforts (product design, crossing and screening, early-stage testing, late-stage testing and on farm verification) focused on a market segment or on a group of similar market segments with very similar target product profiles ending with the identification of distinct products for each market segment the pipeline is focused on.

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Annex 3: Definitions of commonly-used terms

Terms	Description
Essential Traits	Traits must be at or above the threshold value in all new products for a market segment in order to meet/exceed farmer, processor, and consumer requirements.
Essential Improve Traits	Traits are deliberately being improved in the breeding scheme for a market segment.
Essential Maintain Traits	Traits are being maintained at their current level in the breeding scheme for a market segment.
Nice-to-Have Traits	Traits do not need to be in all new products for a market segment to meet/exceed farmer, processor, and consumer requirements.

Value Proposition

Value Proposition is both a strategic and a marketing concept. Value propositions identify the benefits that products (or services) will deliver to users. In the case of B4T, value propositions cluster Target Product Profile Traits with similar potential benefits. They help in (i) conceptualizing benefit projections, (ii) discussions of relative priorities of TPPs with users and stakeholders, and (iii) feasibility assessments of TPPs - the more value propositions are being pursued through the same Target Product Profile, the less progress will be made for every individual value proposition and the less feasible is meaningful impact. These groupings therefore, provide a practical handle on the substantial set of traits considered in the TPPs.

References:

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- CGIAR Breeding Portal User Manual version 5.0 [unpublished document]

About this Market Intelligence Digest

The **Market Intelligence Digest** provides concise, evidence-based guidance to support **Product Design Team (PDT) discussions** in line with CGIAR **Product Design Standards**. It synthesizes market intelligence insights to inform market segmentation, trait prioritization, and advancement decisions within existing breeding pipelines. By complementing technical breeding data, the Market Intelligence Digest helps PDTs clarify the relevance of market segments, demand signals, and adoption considerations for product design decisions.

This series is a collaborative effort of CGIAR centers and partners working on CGIAR Market Intelligence. The views and opinions expressed in this publication are those of the authors and are not necessarily representative of or endorsed by CGIAR.

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