



Market Intelligence Digest

Sorghum | 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

Sorghum | Burkina Faso

A. Market Segments

	Harvested area (ha)	% of Total harvested area
Total Area Covered by Seed Product Market Segment (Active only)	1,870,363	100
<u>Sorghum WAF MS00400</u>		
Sorghum Non-Hybrid WAF Food; Fodder White; Cream Sudan; Guinea zone Rainfed Mid	561,109	30
<u>Sorghum WAF MS00681</u>		
Sorghum Non-Hybrid WAF Food; Fodder; Local Malting Red Guinea zone; Sudan Rainfed Mid	561,109	30
<u>Sorghum WAF MS00673</u>		
Sorghum Non-Hybrid WAF Food; Fodder White; Cream Sahelian Zone Rainfed Early	467,591	25
<u>Sorghum WAF MS00674</u>		
Sorghum Hybrid WAF Food; Fodder White; Cream Sahelian Zone Rainfed Early	187,036	10
<u>Sorghum WAF MS00675</u>		
Sorghum Hybrid WAF Food; Fodder White; Cream Sudan; Guinea zone Rainfed Mid	93,518	5
National Harvested Area (ha) (FAOSTAT)	1,870,364	
Difference between market-segmented area and national harvested area	1	0

Sorghum | Burkina Faso

B. Market Segment Criteria

MS Criteria	Value	Harvested area (ha)	% of Total harvested area
Crop	Sorghum	1,870,363	100
Subregion	West Africa	1,870,363	100
Material Type	Non-Hybrid	1,589,809	85
	Hybrid	280,554	15
Consumer Product Type	Fodder; Food	1,309,254	70
	Fodder; Food; Local Malting	561,109	30
Color	Cream; White	1,309,254	70
	Red	561,109	30
Production Environment	Guinea zone; Sudan	1,215,736	65
	Sahelian Zone	654,627	35
Production System	Rainfed	1,870,363	100
Maturity	Mid	1,215,736	65
	Early	654,627	35

Sorghum | Burkina Faso

C. Target Product Profiles and Breeding Pipelines

Seed Product Market Segment	Target Product Profile	Breeding Pipeline	Breeding Effort
<u>Sorghum WAF MS00400</u>	<u>Sorghum WAF CIMMYT TPP00810</u> <u>Sorghum WAF ICRISAT TPP01036</u>	Sorghum CIMMYT BP00226 Sorghum ICRISAT BP00176	Category 1: Full -
<u>Sorghum WAF MS00673</u>	<u>Sorghum WAF CIMMYT TPP00809</u> <u>Sorghum WAF ICRISAT TPP01037</u>	Sorghum CIMMYT BP00225 Sorghum ICRISAT BP00174	Category 1: Full Category 1: Full
<u>Sorghum WAF MS00674</u>	<u>Sorghum WAF CIMMYT TPP00812</u> <u>Sorghum WAF ICRISAT TPP01039</u>	Sorghum CIMMYT BP00228 Sorghum ICRISAT BP00176	Category 1: Full Category 1: Full
<u>Sorghum WAF MS00675</u>	<u>Sorghum WAF CIMMYT TPP00813</u> <u>Sorghum WAF ICRISAT TPP01040</u>	Sorghum CIMMYT BP00229 Sorghum ICRISAT BP00180	Category 1: Full Category 1: Full
<u>Sorghum WAF MS00681</u>	<u>Sorghum WAF CIMMYT TPP00811</u> <u>Sorghum WAF ICRISAT TPP01038</u>	Sorghum CIMMYT BP00227 Sorghum ICRISAT BP00176	Category 1: Full Category 1: Full

Sorghum | Burkina Faso

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

Value Proposition	Essential improved traits from 10 TPPs*	Key traits from MI Evidence
01 Farmer • Higher Productivity	Grain yield (at 12.5% moisture content) (10)	High Grain Yield/Panicle Productivity
02 Farmer • Higher fodder yield or value	Fodder yield (10)	High Fodder Biomass/Stay-green
03 Farmer • Less Loss & Risk: CC relevant stress	No essential traits to be improved	Yield Stability under Low-Input Conditions
04 Farmer • Less Loss & Risk: Biotic stress	- Anthraxnose Resistance (4) - Midge Tolerance (10) - Striga resistance (10)	- Midge Resistance - Striga Resistance/Weed Suppression
07 Farmer • Greater fertilizer use efficiency	No essential traits to be improved	Nutrient Use Efficiency (NUE)
09 Farmer • Appropriate maturity	No essential traits to be improved	Earliness (Short Cycle)
10 Farmer/user • Longer storage life	No essential traits to be improved	Grain Hardness for Storage
11 User • Less labour	No essential traits to be improved	- Glume Non-Adherence - Ease of Grinding - Milling Recovery/Processability - Ease of Threshing
12 User • Meeting end-user requirements	No essential traits to be improved	- Grain Vitreousness - Pericarp Color (White vs. Red) - Amylose Content - Grain Heaviness (1000-Grain Weight)
13 User • Better nutrition and/or health	No essential traits to be improved	- Resistance to Grain Mold/Aflatoxin - Biofortification (Micronutrients) - High Protein/Amylose Ratio

* 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

Sorghum | Burkina Faso

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

Sorghum | Burkina Faso

E. Synthesis of evidence highlighting key traits by thematic area

Overview

Sorghum is the dominant foundation of food security in Burkina Faso, yet its potential is consistently hindered by fragmented seed delivery systems and rigid regulatory barriers that favor commercial interests over the widespread smallholder reality. While the vast majority of consumers and processors demand specific grain qualities for traditional foods and artisanal brewing, the lack of decentralized infrastructure and limited access to credit exacerbate the gap between released varieties and end-user needs. Strategic breeding must therefore address not only biological resilience to erratic rainfall and parasitic weeds but also the technical processing constraints that disproportionately burden women, ensuring that new varieties are recognizable within dominant informal exchange networks and capable of stabilizing household livelihoods under low-input conditions.

1. Consumers

- **Grain Vitreousness:** Essential for ensuring the required firmness and desired consistency of the traditional thick porridge known as "tô".
- **Pericarp Color (White vs. Red):** Serves as the fundamental market filter for segmenting grains between daily dietary consumption and specialized artisanal brewing.
- **Resistance to Grain Mold/Aflatoxin:** Critical for protecting household health against carcinogenic toxins and meeting emerging safety standards for institutional markets.
- **Biofortification (Micronutrients):** Necessary to address widespread nutritional gaps in vulnerable rural populations through targeted enrichment of Vitamin A, Iron, and Zinc.
- **Grain Hardness for Storage:** Required to prevent grain breakage and resist pest damage, ensuring food security can be maintained for over a year.

2. Processors

- **Starch Consistency (Porridge Firmness):** Processors require grains that produce a firm, non-sticky porridge (Tô) that does not adhere to fingers or teeth after cooling.
- **Tan (Non-Anthocyanin) Plant Type:** Breeding for tan plant types is essential to avoid red grain discoloration that necessitates excessive, wasteful decortication labor.
- **Grain Uniformity:** High uniformity in grain shape and size is a widespread technical requirement for maximizing the efficiency of mechanized urban flour mills.
- **Starch Viscosity/Stickiness:** Functional starch properties are widespread requirements for achieving the specific textures needed for diverse artisanal food products.
- **High Threshability (Ease of Decortication):** Varieties that detach easily from the glume significantly reduce the manual pounding labor widely performed by women.

Sorghum | Burkina Faso

E. Synthesis of evidence highlighting key traits by thematic area

3. Producers

- **High Grain Yield/Panicle Productivity:** The primary driver for producers seeking to maximize caloric output and generate a saleable economic surplus.
- **Earliness (Short Cycle):** Vital for adapting to increasingly erratic rainfall patterns and ensuring crops reach maturity before terminal drought.
- **High Fodder Biomass/Stay-green:** Essential for integrated crop-livestock systems where biomass is the primary feed source during the dry season.
- **Midge Resistance:** Necessary in high-pressure hotspot regions to prevent devastating yield losses during synchronized insect egg-laying periods.
- **Suitability for Animal Traction:** Enables the use of draft animals for weeding and field management, significantly reducing manual labor requirements.

4. Gender & Social Inclusion

- **Striga Resistance/Weed Suppression:** Directly alleviates the "time poverty" of women who are primarily responsible for manual weeding on infested, nitrogen-depleted soils.
- **Nutrient Use Efficiency (NUE):** Critical for vulnerable female farmers who often cultivate the poorest plots without access to mineral fertilizers.
- **Yield Stability under Low-Input Conditions:** Ensures reliable food production for resource-poor households farming in marginal and insecure Production Niches.
- **Grain Heaviness (1000-Grain Weight):** Prioritized by women millers as it is the primary determinant of flour yield and business profitability.
- **Ease of Threshing:** Targeted solution to reduce the physical drudgery of post-harvest labor traditionally performed by women and children.

5. Enabling Environment

- **Recognizable Morphological Traits:** Essential for maintaining variety purity and identity within the dominant informal seed exchange and bartering networks.
- **Seed Longevity:** Offsets the lack of decentralized infrastructure for cold-chain storage by ensuring seeds remain viable in sub-optimal on-farm conditions.
- **Tan Plant Color:** Acts as a "universal" trait that allows a single variety to be more easily promoted across diverse and fragmented market segments.
- **Decentralized Storage and QA:** Required to preserve seed viability and speed up quality certification checks at the community level.
- **Harmonized Regional Seed Regulations:** Necessary to simplify variety release and facilitate the flow of quality seed across regional administrative borders.

Sorghum | Burkina Faso

E. Synthesis of evidence highlighting key traits by thematic area

References

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Sorghum | Burkina Faso

Annex 1. Insights from Market Intelligence Publications

No data available

Sorghum | Burkina Faso

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

Sorghum | Burkina Faso

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.

Sorghum | Burkina Faso

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.

Sorghum | Burkina Faso

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.

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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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