



Lidea

FRESH IDEAS FOR AGRICULTURE

THE LARGEST SORGHUM PORTFOLIO IN EUROPE!

SORGHUM DEVELOPMENT,
NOW A REALITY!





Lidea is above all 2,000 employees who are passionate and committed to the progress of agriculture and who drive it forward through certified seeds with high added value, innovative solutions and projects to meet the farmers' requirements.

- **More than 2,000 EMPLOYEES**
- **A turnover of 395 MILLION euros**
- **8 PRODUCTION SITES** in France, Romania, Ukraine, Spain and Russia
- **19 RESEARCH STATIONS** across Europe
- **MORE THAN 34 MILLION EUROS** devoted each year to R&D investments
- **58,800 HECTARES** of production across 5 countries
- **WORKING ON THE VARIOUS SPECIES:** maize, sunflower, cereals, rapeseed, soybean, sorghum, pulses, forage and cover crops
- **20% of sorghum surfaces** in Europe is sown with Lidea varieties



IN PROXIMITY WITH OUR ECOSYSTEM, LIDEA CREATE AND PROVIDE CUSTOMIZED, SUSTAINABLE SEED SOLUTIONS THAT GENERATE ADDED VALUE FOR PRODUCERS ALL ALONG THE YEAR.

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Through Eurosorgho, Lidea benefits from the first sorghum research program in Europe. The varietal results demonstrate the quality of the sorghum genetics adapted to Europe, that is why Eurosorgho genetics represent more than 30% of seeds sown throughout geographical Europe (Russia included). Our aim is to offer farmers and processors high potential varieties, adapted to all climatic conditions and for all market segments.

 Sorghum ID

A new 3-year European program has been launched for the promotion of sorghum European seeds, called «SEEDSUE 2021-2023» in the countries of France, Italy, Spain, Romania and Bulgaria with a budget of 2.317 M €.



A HIGHLY PROMISING CEREAL FOR ANIMAL FEED

While 60% of wheat, barley and maize in Europe are destined for animal feed, sorghum plays a complementary role: high in protein, with starch to provide energy unsaturated fatty acids and good tolerance to mycotoxins in the field, it enhances the sanitary and nutritional quality of feed diets.

Sorghum offers a safeguard for animal nutrition. In Hungary, a pig producer reduced his ration costs by 5 to 8% with sorghum as the main ingredient.

NUTRITIONAL VALUE OF GRAIN SORGHUM

CROP (average datas 2022) Qualit@lim ARVALIS	ENERGY VALUE (Kcal/kg MS)	PROTEIN VALUE (%)	STARCH VALUE (%)	FAT VALUE (%)
SORGHUM	4 527	11,5	75,2	4,2
CORN	4 488	8,4	74,5	3,7
DIFFERENCE %	+ 39	+ 3,1	+ 0,7	+ 0,5
WHEAT	NC	12,4	69,8	NC
BARLEY	4 446	10,9	62,0	1,8
TRITICALE	4 400	11,1	69,5	1,4

GRAINBREED
SORGHUM DIGESTIBLE YIELD by **lida**

Early genetics leader
made in Europe

PROMISING OUTLETS

In addition to its nutritional values, sorghum is also attractive because of its price with less input needs, no matter what the destination of the feed ration: pigs, poultry, layers, dairy cow, pet food, fish and birds.

Sorghum should not be considered as a substitute cereal (10% to 70% sorghum introduction in the rations), but rather a lever to improve the profitability ratios of industrial feed.



Sorghum is the fifth most cultivated cereal in the world, which is very popular in Africa and now in Europe which is a booming market. 56% of sorghum production worldwide is used for human food. Beyond its agronomic and ecological qualities, the grain of sorghum is nutritionally comparable to the other cereal grains in terms of protein, energy, vitamins, minerals but also it is a rich source of fibre.

SORGHUM: AN ASSET FOR HEALTH

Its chemical composition is extremely interesting because the dried grain contains fiber and natural antioxidants. It is gluten-free and can be used for health reason like celiac disease. Due to its composition, this cereal is highly digestible and easily assimilated. It also contains important minerals such as iron, calcium, magnesium and phosphorus. Grains contain vitamins such as niacin (vitamin B3) and vitamin B6, and low glycemic index for diabetic peoples which make this food rich from a nutritional point of view.

Sorghum is an ally to fill up with energy.

OUTLETS :

There are many products made from sorghum in human food.

Sorghum can be found in different forms such as flour, whole grain, pasta, milk, flaked, pop sorghum, sorghum flakes, energy bar, beer and spirit and many others.

DID YOU KNOW ?

China is the largest producer of sorghum alcohol. Baijiu, the 1st spirits in the world, is not for nothing. Lidea's varieties are used to produce Whisky in Hungary, France and vodka in Moldova.



with & without tan

Sorghum WHITE TAN: preserves the light white color of the grain, an important element for human nutrition.



SORGHUM FODDER:
MAKE THE RIGHT CHOICE FOR BETTER USE

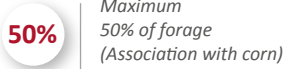
Depending on the use of single-cut fodder sorghum, the growing areas and the sowing dates, the selection criteria and their hierarchy vary. The earliness of heading and harvest, the levels and components of the energy value, the susceptibility to lodging, as well as the yields and their regularity must be taken into account, without forgetting the vigor at the start.



GROUPE 1
SINGLE-CUT FODDER GRAIN SORGHUM: medium height, rich in starch and early

PHENOTYPE	TYPE	CHARACTE- RISTIC	BENEFITS	STARCH	SOLUBLE SUGAR	dMO **	UFL *	DAIRY COWS (>35 KG MILK/ DAY)	DAIRY COWS (≈25 KG MILK/ DAY)	HEI- FERS	FATEN- NING YOUNG BULLS	CHEEP	GOAT	BIOGAS
Medium height grain sorghum	Bicolor* Bicolor	Sorghum grain, with high starch content	High digestibility, alimentary value, average yield	Medium to high				50%	50%					
Medium height grain sorghum with BmR character	Bicolor* Bicolor	Sorghum grain, with high starch content with BmR character	High digestibility, alimentary value, good milk yield and fat milk content	Medium to high				50%	50%					

*Unit forage milk” /kg of DM 1 UFL/kg of DM≈1700 kcal ≈7.1 MJ of Net energy
** digestibility of Organic Matter



To help the farmer in his choice and provide him with an adapted varietal response, Lidea developed an approach with a large “Silobreed sorghum” portfolio suitable for all types of animal production: dairy and bovine. The strategy of using fodder sorghum is not only a question of yield but also of quality, production gain and balanced association with other cereals.

GROUPE 2
SINGLE-CUT FODDER SORGHUM: high height, low starch and more late

PHENOTYPE	TYPE	CHARACTE- RISTIC	BENEFITS	STARCH	SOLUBLE SUGAR	dMO **	UFL *	DAIRY COWS (>35 KG MILK/ DAY)	DAIRY COWS (≈25 KG MILK/ DAY)	HEI- FERS	FATEN- NING YOUNG BULLS	CHEEP	GOAT	BIOGAS
High height with low grain production	Bicolor* Bicolor	Tall plant (>2 meters), with low grain production	High yield dry mass, medium alimentary value, good in drought conditions	Low	Medium to high	Medium to high	Medium							
High height and Sterile	Bicolor* Bicolor	Tall plant (>2 meters), no grain production	High yield dry mass, medium alimentary value, good in drought conditions	none	Medium to high	Medium to high	Medium							
High height with low grain production or sterile with BmR character	Bicolor* Bicolor	Tall plant (>2 meters), with low or no grain production but with BmR character	High yield dry mass, High digestibility (low lignin), good in drought conditions	none to low	Medium to high	Medium to high	High							
Photoperiod sensitive sorghum (PPS)	Bicolor* Bicolor	No grain production, late	Digestibility medium to right High green mass yield	none	Medium to high	Medium to high	Medium							

*Unit forage milk” /kg of DM 1 UFL/kg of DM≈1700 kcal ≈7.1 MJ of Net energy
** digestibility of Organic Matter

GROUPE 3
SINGLE-CUT FODDER SORGHUM BIOMASS : industrial uses

PHENOTYPE	TYPE	CHARACTE- RISTIC	STRONG POINT	STARCH	SOLUBLE SUGAR	dMO **	UFL *	DAIRY COWS (>35 KG MILK/ DAY)	DAIRY COWS (≈25 KG MILK/ DAY)	HEI- FERS	FATEN- NING YOUNG BULLS	CHEEP	GOAT	BIOGAS
Very high height sorgho, high biomass rich in fiber	Bicolor* Bicolor	Sorghum rich in fiber and high biomass yield, low digestibility	Very high green mass yield Good biogas yield	none	Medium to high	Poor	Poor							

*Unit forage milk” /kg of DM 1 UFL/kg of DM≈1700 kcal ≈7.1 MJ of Net energy
** digestibility of Organic Matter

SORGHUM A LARGE DIVERSITY OF ORIGINAL OUTLETS

Although the main outlets are dedicated to human food and animal feed, new outlets are developing.

BIO ENERGY

Sorghum rich in fiber is used for the production of industrial biomass (pulp, fuel, wood, etc.), bio ethanol and biogas. New biomass valuations from sorghum are promising.

DID YOU KNOW ?

With 1 tonne of grain sorghum you can produce 390 to 410 liters of ethanol, more than corn (370 to 390 liters). Sorghum Distillers Dried Grains with Solubles (DDGS), a co-product of starch-based ethanol production, tends to be lower in fat and higher in protein than corn (29,92% vs 26,00%), and pharmaceutical industry use with an absolutely neutral smell & taste (methanol content = 0,0006%).
(Source: Zernoff Moldova).

With 1 ha of sweet sorghum, you can produce 4,000 to 7,000 liters of ethanol (source: European Commission).

With a variety of biomass sorghum, you can produce nearly 7,000 m³ of methane per hectare (source: INRA).



BIOMATERIALS

Rods provide flexible films (plastic film type), materials construction like concrete blocks or insulation panels. Stem and panicle are used for the fibrous parts of the plant for manufacturing pulp. Some other innovations appear like colorants and bioplastic useful for the automotive industry.

The researchers have developed a sorghum that is far more effective for biomass-based plastic and will be much cheaper and more sustainable than plastic.

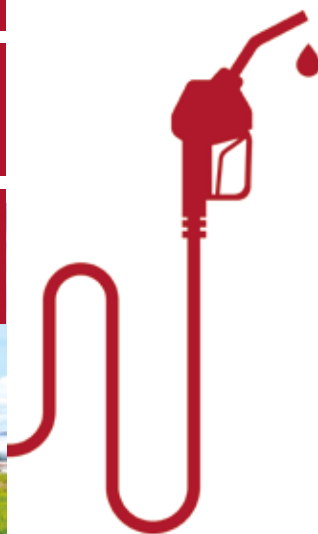


DID YOU KNOW ?

SORGHUM: AN ALTERNATIVE CROP IN FIELD CONTAMINATED BY DIABROTICA

There is a resurgence of the insect Diabrotica on maize in Europe, particularly in France, Austria and Germany. Principally, the larvae destroy the roots of the plant and cause lodging. One of the existing control solutions is to cut the cycle of this harmful insect by introducing sorghum into the crop rotation because it is not affected.

The main objective is the preservation of the cultivation of corn.



MATURITY	NAME	GRAIN	PANICLE	OUTLETS	CLIMATE PROFILE			
					HOT AND DRY	MEDIUM STRESS	NO STRESS	COOL AND WET
VERY EARLY Day cultivation 85-90 days	ARSKY			  	★★	★★★★	★★	★★
	PONANT			  	★★	★★★★	★★	★★
	 WILLY			  	★★	★★★★	★★	★★
	ARMORIK			  	★★	★★★★	★★	★★
EARLY – MID EARLY Day cultivation 90-115 days	 KALAHARI SU			  	★★★★	★★★★	★★	★
	 MARGO			  	★★★★	★★★★	★★	★
	 ARCANE			  	★★★★	★★★★	★★	★
	SHAMAL			  	★★★★	★★★★	★★	★
	 GIBSON			  	★★★★	★★★★	★★	★
	ALIZE			  	★★★★	★★★★	★★	★
	FOEHN			  	★★★★	★★★★	★★	★
	MONSOON			  	★★★★	★★★★	★★	★
	BOREAS			  	★★★★	★★★★	★★	
MID LATE - LATE Day cultivation more 115 days	 TANAMI			  	★★★★	★★★★	★★	

★★★★
Perfectly adapted

★★★
Adapted

★
Little adapted

No adapted

 Compact

 1/2 Compact

 1/2 Open

 Open

MATURITY	NAME	GRAIN	PANICLE	OUTLETS	CLIMATE PROFILE			
					HOT AND DRY	MEDIUM STRESS	NO STRESS	COOL AND WET
VERY EARLY Day cultivation 85-90 days	ARABESK			  	★★	★★★★	★★	★★
	 SINAÏ			  	★★	★★★★	★★	★★
EARLY – MID EARLY Day cultivation 90-115 days	 ZEALANDIA SU			  	★★★★	★★★★	★★	★
	ALBANUS			  	★★★★	★★★★	★★	★
	ARALDO			  	★★★★	★★★★	★★	★
	ARTISTA			  	★★★★	★★★★	★★	★
	KALATUR			  	★★★★	★★★★	★★	★



DID YOU KNOW ?

The ingredient sorghum in animal feed such as pig, reduces the risk of oxidation of the meat produced which is related by the «particularly» fatty acid profile (4.5%), sorghum have less iodine, linoleic acid and polyunsaturated fatty acids. It may reduces the feeling of rancid taste.

Spain is the leading importer of sorghum in Europe for pig production.



Feed



Food



Bioethanol

MEDIUM HEIGHT PLANT, HIGH STARCH CONTENT AND EARLY TO MID LATE

MATURITY	NAME	GRAIN	OUTLETS	STARCH	SUGAR	MILK yield and quality	CLIMATE PROFILE			
							HOT AND DRY	MEDIUM STRESS	NO STRESS	COOL AND WET
MID EARLY BmR	 ARIGATO			+++	++	+++	★★	★★★★	★★	
MID EARLY	ES HARMATTAN		 	+++	++	+++	★★	★★★★	★★	
	 JASPE		 	+++	++	+++	★★	★★★★	★★	
	 PANDORE		 	+++	++	+++	★★	★★★★	★★	
MID LATE BmR	  EUG2243F (ORPHEE)			+++	++	+++	★★	★★★★	★★	



DID YOU KNOW ?

«FISH FARM»

Poor tannin content, lower risk of mycotoxins, lower content of linoleic acid and polyunsaturated acid, increases its interest for the quality of the flesh of the fish produced. Sorghum is generally introduced at 40-50% in the ration:
Up to 300 gr. - grounded sorghum, 300-600 gr. - crunchy sorghum and 600 gr. - whole grain.



«GOOSE OR DUCK FOIE GRAS»

Sorghum is rich in protein, particularly in protein with branched amino acids that help strengthen cell walls and therefore limit the livers melting. These amino acids activate another fat storage pathway in the liver that can improve live weight or reduce force-feeding time.

TALL PLANT, LOW STARCH CONTENT & MID LATE TO LATE

MATURITY	NAME	GRAIN	OUTLETS	STARCH	SUGAR	MILK yield and quality	CLIMATE PROFILE			
							HOT AND DRY	MEDIUM STRESS	NO STRESS	COOL AND WET
MID-LATE BmR	  SAPHIR		  	+	+++	+++	★★★★	★★★★	★★	
	 BMRGOLDX	sterile	 		+++	+++	★★★★	★★★★	★★	
MID-LATE	ES ATHENA	sterile	  		++	+++	★★★★	★★★★	★★	
	 EMERAUDE		  	+	+++	++	★★★★	★★★★	★★	
	 ES HYPERION	sterile	 		+++	++	★★★★	★★★★	★★	
	 RUTILE		   	+	+++	++	★★★★	★★★★	★★	
	 STYX	sterile			++	+	★★	★★★★	★★	★★

★★★★
Perfectly adapted

★★★
Adapted

★
Little adapted

No adapted



Feed



Bioethanol



Bioenergy



Food



1

PREPARE THE SOIL TO GET A GOOD ESTABLISHMENT

OBJECTIVE: Get a good soil structure and a good seed-bed.

- In superficial soil, possible with a good structure of the soil in depth.
- Limit the number of passage to avoid smoothing and compaction of the soil.
- A cloddy soil could disrupt seed germination.
- In loamy soils, sorghum is very susceptible particularly after planting.
- In Farm, with the NoTill system, sorghum sowing is possible or even recommended.
- Avoid soils too much superficial which will not enhance the potential of sorghum which can be more than 10 tons / ha of yield performances.

2

CHOOSE VARIETIES ACCORDING TO 7 CRITERIA

OBJECTIVE: Adaption to the area.

- **Earliness:** adapt the choice to the region and to the sowing date. Early to Mid-Early grain varieties for early harvest.
- **Yield performance.**
- **Apical sterility tolerance:** avoid susceptible varieties.
- **Dryness tolerance:** principally without irrigation.
- **Susceptibility to macrophomina and fusarium:** avoid susceptible varieties.
- **Lodging resistance:** a good behavior makes the harvest.
- **Panicle release aptitude:** a breeding target, all Lidea varieties with a good tolerance.

3

GOOD PLANTING

OBJECTIVE: Quality of emergence a key point.

- The sowing depth: between 2 and 4 cm.
- Insure the population, the main yield component.
- **Planting date:** depends on 3 main factors:
 1. Soil temperature ($> 10/12^{\circ}$)
 2. Desired flowering depends of climatic area
 3. Harvest date
- **Density of planting:** depends of several factors:
 1. Earliness of the planting
 2. Water reserve of the soil: in dry condition, planting with a density may increase competition between plants => Rapid exhaustion of soil's water reserve and macrophomina risk
 3. Losses during the emergence
 4. Yield component of the variety

4

WEEDS CONTROL

OBJECTIVE: Prevent weeds development.

- Sorghum planting has to be made on a proper soil.
- Quick emergence with good cover of the soil will decrease the development of weeds.
- Seeds treated with CONCEPIII: S-metolachlor at seedling or before emergence.
- **Early post-emergence stage (3 leaves):** conventional grasses and dicotyledons. Ideal stage for herbicide selectivity against sorghum.
- **Postemergence, 4-8 leaf stage:** dicotyledonous.

5

FERTILISATION

OBJECTIVE: Interest principally for determination of grain per panicle, nitrogen application before heading stage (12 leaves).

- **Superficial soil:** early application before 6 leaves.
- **Other soil situation:** in dry condition, only one application at sowing. With irrigation, one application at sowing and 2° application before first irrigation 10-12 leaves maximum.
- **P & K:** New variety with low exigence, only needs if soil nutriment not enough, if necessary application just before sowing.

6

HARVEST

OBJECTIVE: When the grain are mature, the leaves stay green.

GRAIN USES:

- Maturity is achieved when grains humidity is 35% H₂O, harvest can start when humidity is at 25% H₂O, **15-16% H₂O is the norm of harvest.**
- Cut as high as possible panicles (harvest only panicle).
- Do not harvest stem or leaves with increasing of grain humidity.

FODDER USES:

- Try to get 30-32% of dry matter.
- **Ideal stage to harvest:**
 - the grain is milky and pasty at the bottom of panicle.
 - color of leaves not a good indicator for the harvest.



OR





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Lidea
FRESH IDEAS FOR AGRICULTURE