

Sorghum^{ID}

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VARIETIES OF FODDER SORGHUM

There is a very wide variety of genetic types in fodder sorghum. Some varieties are harvested only once: these are so-called “single-cut” sorghums, which need 100 to 140 days of vegetation. Other varieties are harvested several times generally by mowing or pasturing, the first cut coming 45 to 60 days after sowing: these are multi-cut sorghums. Fodder sorghum surfaces are estimated at 40,000 ha in the EU and 110,000 in Ukraine-Russia.



Single-cut fodder sorghums

“SILAGE” SORGHUMS ARE DISTINCTIVE thanks to the very high energy value they offer. They are recommended for producing high-quality silage or green feeding. This type of sorghum is intended for feed in performance herds (milk and meat production).

“Dual-use sorghums” are characterised by intermediate-level energy value that offers them two possible uses:

- in the trough, thanks to the good quality of the produced silage,
- at the industrial level, mainly during methanisation.

Sorghums “primarily for industrial use” These sorghums are richer in plant fibres, less digestible and to be reserved for primarily-industrial use: biomethanisation, biomaterials, biofuels, cremation, etc. They are known by different names: biomass, fibre or paper sorghum.



Multi-cut fodder sorghums

As its name implies, this type of sorghum is intended to be harvested several times, grazing or cut (green feeding, wrapping or hay), but is sometimes used in a single cut (silage).

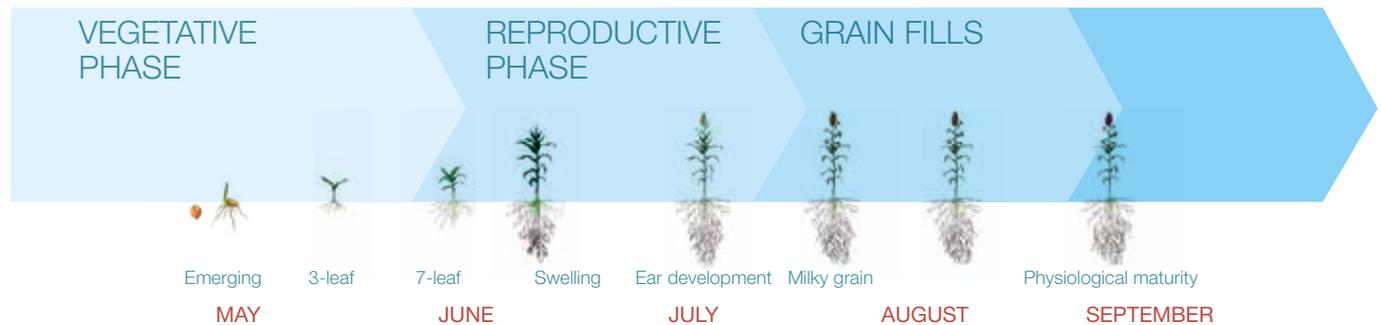
IT CAN BE DIVIDED INTO TWO CATEGORIES:
Sudan Grass Generally earlier than the hybrid variety, these are sorghums with large tillering and re-growth capacity, with thin stems and leaves.

Hybrid (Sorghum Bicolor x Sudan grass) Later than the Sudan Grass type, these sorghums have higher yield potential. They are coarser in morphology, but also more vigorous.

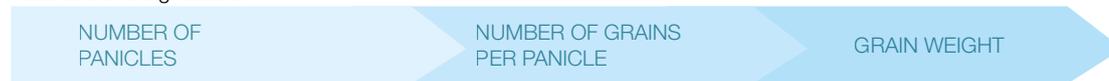
TECHNICAL ITINERARY

Sorghum cycle

Sorghum grain is an annual self-pollinating plant using C4 carbon fixation, which enables the plant to enjoy good photosynthetic yield and thus greater efficiency under warm and dry conditions.



Yield-determining factors:



Sensitivity to hydric stress:



Crop growing zone



Fodder sorghum, like grain sorghum, enjoys heat.

It is important that the single-cut fodder sorghum varieties' early growth characteristics be adapted to the region and pedoclimatic conditions. The aim is to silage a sufficiently-mature sorghum, around 27-30% of the full-plant DM. At this stage, the maximum yield has been reached, fodder is well preserved and it is well-consumed by the animals.

Implantation

You will need to sow in well-heated soil, as sorghum's initial vigour is highly-dependent on soil temperature. It is advised that you sow as soon as the soil temperature reaches 12°C minimum, with one week of fair weather to follow. This will enable swift and even emergence, facilitating weeding. Sorghum seeds are relatively small and need to be positioned between 2 and 4 cm into the ground, in cool conditions. The seedbed needs to be fine, in order to ensure good soil/grain contact; maintain small plugs at the surface should there be a risk of soil sealing. Stay away from overly cloddy soil and excessively deep sowing.

Recommended sowing density in number of seeds per hectare

	Single-cut (in thousands)			Multi-cut			
	Inter-row spacing	Silage use	Industrial use	Sudan Grass type	Hybrid type		
Airplanter	40 to 50 50 to 60 60 to 80	210 to 250 190 to 230 180 to 220	230 to 270 210 to 270 200 to 240	Grass seed box 25 to 30 kg	20 to 25 kg		
Comments	Increase by 10% if sowing conditions are difficult (clumps of soil, direct sowing, etc.)					Very low TKW, at 11 to 25 gr Very well suited to catch crop sowing, as the vegetation cycle is very short	

Weeding

Sorghum is a crop sensitive to early competition from weeds. Successful weeding is one of the key points on this itinerary. It is particularly important to take aim at grass weeds in emergence not exceeding the 2-3 leaf stage. This application can also be used to fight broadleaf weeds. There too, the soil's surface humidity at the time of treatment and in the following days is essential for successful weeding.

Depending on the existing flora, it may be possible to apply anti-grassweed during the post-sowing/pre-raising (root product), or anti-grassweed and anti-broadleaf weeding during sorghum's 3-4-leaf stage (root- and leaf-penetrating herbicides). Sowing done using an airplanter can be weeded mechanically more than once, if necessary.



Fertilisation

Though sorghum is a species with low phosphorus and potassium requirements, it is recommended that a supplement be added during the sowing process when planting in P/K-poor soils. Below is a chart summarising the N, P and K requirements.

	 Single-cut			 Multi-cut			
	N	P	K		N	P	K
Upon sowing	30 to 40kg (If 60kg/ha remainder)	60 to 80 kg	60 to 80 kg	Upon sowing	30 to 40 kg	60 to 80 kg	60 to 80 kg
6- to 8-leaf stage	100 to 140 kg			After each cut	30 to 40 kg		

TECHNICAL ITINERARY

Harvesting and storage

The aim is to harvest fodder with 27-30% DM, so as to ensure high-quality silage, a leakproof silo, good conservation and maximum silage ingestibility. Harvesting should generally take place as soon as the leaves at the plant base show signs of drying. Generally speaking, sorghum silage should not be too finely or coarsely chopped, so as to ensure good silo stability upon opening.

Tip:

Sorghum's chemical composition makes it possible to ensure high-quality conservation, provided that basic rules on silo development are respected:

- Silo dimensions suited to up-take speed, 10 cm/day minimum in winter and 20 cm/day in summer,
- Maintain cleanliness during harvesting: prevent earth from getting into the silo,
- Well stacked and packed layers of fodder,
- Quick, hermetic covering.

If the 30% DM objective of the full plant is not reached, the main risk during storage is the production of juice in the silo, which will result in significant nutritional value loss.



USES

In rations, sorghum is used primarily as a source of energy- and fibre-rich fodder. It is always combined with foods containing the proteins and minerals it is lacking.

Uses for single-cut fodder sorghum

Milk cow rations

“Silage” sorghums are distinctive for the very high energy value they offer. They are recommended to produce high-quality silage or green feeding. This type of sorghum is intended for feed in performance herds (milk and meat production).

“Dual-use” sorghums are lower in energy value than silage sorghums, and can thus be incorporated into rations at around 30-35%.

DM concentration has to reach at least 0.85-0.90 UFL/kg in sorghum silage so that milk production remains at the same level. Furthermore, sorghum silage has a positive effect of +5% to +10% on milk fat levels. Beyond 50% supplementing with silage sorghum, the drop in raw milk is no longer offset by the high fat level in sorghum-based rations.

Rations for young bovine animals

Securing high growth performance in young bovine animals intended for fattening requires that energy-rich rations be planned out. “Silage” sorghum, with low-grain content or no grain, is highly digestible and a good starch-free source of energy. It can be likened to young pre-wilted grass silage. Combining fodder maize and sorghum in a single ration makes it possible to build a safe, highly-digestible ration, which combines two forms of fodder that are very complementary from a nutritional standpoint.

Examples of rations supplemented with sorghum

Rations calculated for daily milk production of 32 kg/d, from early-lactation cows

COMPOSITION % DM				
Fodder maize	35%		36%	28%
“Silage” sorghum without grains	35%	50%		
“Dual-use” sorghum with 15% starch				28%
“Silage” sorghum with 28% starch			36%	
Alfalfa hay (start of sprout)		13%		
Wheat straw			2%	
Maize kernels dry flat		14%		14%
Meal Tanned rapeseed	6%		6%	
Meal Industrial rapeseed	23%	22%	18%	21%
Dehydrated beet pulp				18%
MVS + salt	2%	2%	2%	2%



Fodder maize + sorghum
“Silage” without grains



“Silage” sorghum
without grains



Fodder maize + sorghum
“Silage” with grains



Fodder maize + sorghum
“Dual use”

Uses for multi-cut fodder sorghum

MULTI-CUT FODDER SORGHUMS ARE SINGULAR as they offer the benefit of being usable in different forms: grazing, green feeding, and wet conservation (wrapping, silage) as well as dry conservation (hay).

- Do not cut the sorghum too low (leave a heel around 10 cm high). This heel, being sufficiently high, will facilitate ventilation for pre-wiling (2 to 3 days) and contribute to crop regrowth.

- This fodder can also be silaged and stored in silo.
- The fodder is as much suited to large as to small grazing animals, such as sheep.

Multi-cut fodder sorghum is particularly adapted to combined crop growth, in particular with leguminous plants (clover) that will enrich the fodder with proteins. In this event, it is important to choose an annual leguminous plant, capable of growing in summer (heat- and drought-resistant).

