

Sudan grass



Low in starch and high yielding, fodder sorghum is used in addition to and independently from fodder maize for animals with moderate needs. Feed values have positively evolved thanks to varietal selection.

Choosing the varietal type

2 types of sorghum are marketed for biomass harvesting :

- Single-cut sweet sorghums are harvested for silage. Two possible uses: fodder or methanisation.
- Multi-cut fodder sorghums are harvested for silage or haylage, or grazed. Three possible uses: fodder, methanisation, inter-crop plant cover.



Specific characteristics

○ Sorghum panicle

- Fertile panicle: This sorghum develops from the grain and has a variable starch content (5 to 15%).
- Sterile male: The panicles remain sterile and the plant contains no starch.
- Photoperiod sensitive (PPS): In France, this type of sorghum does not head out; the panicle is absent. The solid stem means that they have a good plant life, but the dry matter content at harvest remains lower than that of other types.

○ BMR (Brown Mid Rib) gene

Recognisable by their brown midrib, these varieties have a gene that gives them a lower lignin content:

- ☺ Fiber digestibility, and therefore energy value, increases.
- ☹ Susceptibility to lodging is increased; a strong inequality between varieties. The brown midrib is more or less accentuated depending on the variety.

When should they be sowed ?

Planting takes place from May, on sufficiently warmed soil (soil temperature > 12°C).

○ Single-cut sorghum

Harvesting is possible from 165 to 170 days to achieve a DM content of 28-30%. Single-cut sorghum is not suitable for use as a catch crop after straw cereal as the available time is too short compared to that of the vegetative cycle (150 to 170 days).

○ Multi-cut sorghum

Its shorter vegetative cycle (75-90 days for Sudan variety, 90-110 days for hybrid variety) gives it more latitude in rotations. Sow in warmed soil (soil temperature > 12°C): as the main crop after a catch crop or as a summer crop after immature meslin, straw cereal or rapeseed.

Planting

Forage sorghums are sown with a conventional wheat drill. The dosage depends on the variety :

- Sudan grass: 25-30 kg/ha. These varieties have a strong tillering capacity and grow earlier than hybrids.
- Hybrid (Sorghum bicolor x sudanense): 20-25 kg/ha. These varieties are vigorous and have a high yield potential.

They can be combined with legumes to rebalance the fodder in proteins: combine Persian clover and Alexandrian clover.

For **sweet sorghums**, three types of equipment can be used :

- A grain drill, with 2 out of 3 outlets closed so as to achieve an inter-row spacing of about 35 cm.
- A beet seeder, adapted and equipped with special discs, with spacing of 40-45 cm.
- A maize drill equipped with special discs.

The quality of sowing is measured by the regularity of seed distribution, the regularity of sowing depth and good soil-seed contact. A mono-seed drill is preferable.



| Soil type | Spacing (cm) | Weight per thousand grains (g) | | | | Density (g/ha) |
|----------------|--------------|--------------------------------|-----|-----|-----|----------------|
| | | 28 | 30 | 32 | 34 | |
| Shallow soil | 35 | 5,3 | 5,7 | 6,1 | 6,5 | 190 000 |
| | 45 | 5,0 | 5,4 | 5,8 | 6,1 | 180 000 |
| | 75 | 3,9 | 4,2 | 4,5 | 4,8 | 140 000 |
| Deep soil | 35 | 6,7 | 7,2 | 7,7 | 8,2 | 240 000 |
| | 45 | 6,2 | 6,6 | 7,0 | 7,5 | 220 000 |
| | 75 | 5,0 | 5,4 | 5,8 | 6,1 | 180 000 |
| Irrigated soil | 35 | 7,3 | 7,8 | 8,3 | 8,8 | 260 000 |
| | 45 | 6,7 | 7,2 | 7,7 | 8,2 | 240 000 |
| | 75 | 5,6 | 6,0 | 6,4 | 6,8 | 200 000 |

Sowing amount of sweet sorghums (in g/ha) depending on the soil, varietal PMG, and inter-row spacing.

The indicated doses will be increased by 10% if the sowing conditions are difficult: direct sowing, sowing on very cloddy soil, location with risk of cool conditions, etc.

Nitrogen fertilisation

○ Single-cut sorghum

In order to limit the risk of lodging, especially with tall and/or BMR-type varieties, the introduction of mineral or organic nitrogen should be limited to 80-100 units/ha.

○ Multi-cut sorghum

Moderate additions after each harvest (30-40 N/ha) promote the development of the biomass. If necessary, irrigation will be used to recover the nitrogen added.

Distinctive characteristics of multi-cut sorghum

Weeding : Its high covering power limits weed growth. . In the event of weediness, the same herbicides as grain or single-cut sorghum will be used, but be careful: multi-cut sorghum is more sensitive and the DAR of the molecules used should be checked. Mechanical weeding remains suitable.

Irrigation : Its high extraction efficiency gives it good tolerance to water stress, with, however, perceived limits in 2020. In case of stress, it stops its growth and restarts as soon as the water shortage ends.

Harvesting

○ Single-cut sorghum

A DM content of 28-30% is sought. This threshold is rarely exceeded under normal vegetation conditions. Adjust the cutting length to between 2 and 4 cm, and remove accessories.

- Varieties with grains: ensile when the grains at the centre of the panicle are milky-pasty.
- Varieties without grains: sever a stem and twist it; if almost no juice comes out, it is almost at the right stage. In practice, as long as conditions are maintained (sufficient temperature > 12° C, soil bearing capacity ensured), the crop can be left in place.



○ Multi-cut sorghum

Multi-cut sorghum behaves like a prairie grass: the feed value drops after heading. Harvest at the bolting stage, at the latest one week before the start of heading.

Pasture and green chop : This is hazardous with sorghum that is too young!

Young sorghums contain dhurrin which turns into toxic prussic acid in the rumen. The risk reduces significantly during the vegetative phase:

Do not allow grazing: under 40-50 cm in height for Sudan types; under 50-60 cm in height for hybrids,

Wilting : Wait 24 hours after cutting.

Dhurrin disappears in stored fodder: silage, haylage, hay.

Mowing : Leave a height of 10 cm to promote regrowth.

Wrapping : Favour varieties with fine stems to avoid piercing the plastic.

Silage : Harvest before heading to guarantee quality conservation and good feed value. Consider using PPS varieties: the absence of heading gives flexibility to harvesting sites.