

Silage sorghum, an alternative to silage maize

Problem

Forage production of silage maize becomes increasingly challenging due to soil quality degradation, increasing pressure of diseases and pests, legal limitations in N and P-fertilization rate, higher chances of drought and excessive water due to climate change.

Solution

Silage sorghum deeper roots allow for a better drought tolerance and soil carbon increase. Silage sorghum tolerates less fertiliser and is less susceptible to pests and diseases than maize.

Benefits

Growing forage crops with varying drought stress tolerance in parallel increases resilience to weather extremes.

Applicability box

Theme

Rotation, field, forage, drought tolerance

Agronomic conditions

Temperate climate

Application time

Spring to autumn

Required time

Sowing, weed control, fertilisation, harvest

Period of impact

Cropping season

Equipment

Plough, single-grain seeder with sugar beet disc, harrow/ho, combine harvester

Best in

Arable farms with livestock

Practical recommendation

Production of silage sorghum is similar to silage maize including machinery, except for:

Sowing

- Wait until the soil reaches a temperature greater than 12 °C (better: 14-15 °C) for seeding, ca. end of May, begin of June. Use the sugar beet disc for the single-grain seeder.
- Ploughing prior seeding elevates the soil temperature and suppresses weeds. Consider making a false seedbed prior to seeding.
- Row distance can be 50 or 75 cm with densities of 20-25 plants/m² (*S. bicolor*) or 30-35 plants/m² (*S. bicolor* x sudanese) and sowing depth is around 3-4 cm. Sorghum is tillering.



Figure 1: (Left) Standard maize herbicides can cause damage to sorghum (Laurens van Run, WUR) Figure 2: (right) sorghum grown organically (Maïke Krauss, FiBL)

Management

- Sorghum growth is slow at the beginning. Be on top of weed management as yield loss by weeds is larger with sorghum than with maize.
- Apply preferably mechanical weeding (e.g., harrowing or hoeing). Yet, be careful as sorghum is more prone to mechanical damage by harrowing than maize. Hoeing in later stages is working well. After canopy closure, plant height can reach up to 4-5 m (depending on variety) outcompeting weeds for light at later stages.
- Be careful with herbicides as sorghum is sensitive (Figure 1). E.g., Callisto herbicide can cause a lot of damage and retard growth of sorghum up to 2 weeks. Should mechanical weed control fail, herbicide application is good to assure yield. Ask your seed supplier which herbicide is best used for sorghum.
- Fertilisation of 100-120 kg N is sufficient. Best are split applications (see recommendations for maize).

Harvest

- For silage, dry matter contents lower than 32 % are recommended. Optimal harvest timing is between milk and dough ripening around 30 % dry matter: risps have grain and are reddish. Stems are still green (Figure 2).

Important to know

- Sorghum can be infested by *Rhizoctonia solani*. Avoid sugar beets as pre-crop. Apply Trichogramma as sorghum is susceptible to the European corn borer (*Ostrinia nubilalis*). In contrast, it is an alternative to maize in case of high infestation with western corn rootworm (*Diabrotica virgifera*).
- Sorghum contains hydrocyanic acid. Best do not graze. Silage duration should be 3 weeks at minimum.
- Assure that Near Infrared Reflectance Spectroscopy (NIRS) analysis of silage quality is done with a specific calibration on sorghum. A maize calibration gives wrong results on forage quality.
- Sorghum can be intercropped with maize. Assure equal maturing in this case for a combined harvest.

Further information

Video

- [Mechanical weeding in row crops \(DE\)](#)
- [Sorghum varieties explained \(NL\)](#)

Further readings

- [KWS application note \(DE\)](#)
- [LBI report on variety and fertilisation trials \(NL\)](#)
- [LBI report on nitrogen use efficiency trials \(NL\)](#)

Weblinks

- DSV website variety availability (NL)
- Use the comment section on the [DiverIMPACTS discussion forum](#) to share your experiences with other farmers, advisors and scientists! If you have any questions concerning the method, please contact the author of the practice abstract by e-mail.



About this practice abstract and DiverIMPACTS

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Project website: www.diverimpacts.net

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