

SORGHUM-SUDANGRASS: A VIGOROUS COVER CROP

by [Vern Grubinger](#)

Vegetable and Berry Specialist, University of Vermont Extension

In the heat of summer, sorghum-Sudangrass really puts the pedal to the metal, growing very fast and producing as much biomass as any cover crop can in just a few months, at least in temperate regions. Such abundant, rapid growth is what makes sorghum-Sudangrass an excellent summer ‘smother’ crop for suppressing weeds and adding organic matter to the soil.

There is little light available to weeds that try to grow in the understory of a thick stand of sorghum-Sudangrass. That, plus competition for water and nutrients, makes this cover crop effective at weed suppression.



In addition, the crop is heat and drought tolerant, so it won’t stall out when other crops might. Because it winterkills with the first hard frost, the cover crop can be left as a dead residue to protect the soil from erosion; it will then be relatively easy to manage the following spring.

Sorghum-Sudangrass is also a good cover crop choice if you are trying to improve worn-out soils. Besides smothering weeds and adding organic matter to the soil, it can help penetrate compacted subsoil. Following this aggressive grass cover crop with a legume cover crop can be part of a plan for restoring soil health in over-farmed fields.

This hybrid is a cross between forage-type sorghums and Sudangrass. It is adapted to much of the U.S., so long as there is enough rainfall, and if the temperature of the soil reaches 65 degrees at least two months before the first frost.

One way that sorghum-Sudangrass (often called by a trade name, Sudax) adds so much biomass is by getting big. It can grow from 5 to 12 feet tall, with stalks up to one half inch thick. Dry matter production of 4,000 to 5,000 pounds per acre, or more, is not uncommon.



A dense stand of Sudax stalks looks a bit like field corn without the ears, but compared with corn, it has less leaf area, more secondary roots and a waxier leaf surface--traits that help withstand drought. Like corn, it requires good fertility, and usually some added N, for best growth. However, its extensive root system does a good job of finding available soil N, helping to prevent leaching. Then, the N in the cover crop biomass can become available to subsequent crops as residues decompose.

When using this crop as smother crop to suppress weeds, it should be seeded densely, and care must be taken to establish a good stand. The book [Managing Cover Crops Profitably](#), published by the Sustainable Agriculture Network, recommends seeding rates of 35 lb/acre if drilled, 40 to 50 lb/acre if broadcast. Seeding depth should be 0.5 to 1.5 inches: you can plant shallow in heavier soils, but sow more deeply in sandy soils.

The crop should be planted after the threat of frost in spring and before July 15 in most of the Northeast to allow for maximum growth. Planting with less than six weeks until frost will result in low levels of dry matter production. Warm soil temperatures, over 60°F, are required for germination.

Planting with a seed drill into a well-prepared seedbed will result in a better stand and requires less seed than broadcasting followed by light tillage. Although row spacing does not affect yield, narrow rows are better for cover cropping. A good stand is important for dry matter production and weed suppression.

For best growth, make sure that soil pH is between 6 and 7, although Sudax tolerates a wide range of soil pH. In general, apply the equivalent of 40 to 60 lb/acre of nitrogen at planting, as bagged fertilizer or other soil amendments, to ensure plant establishment and stimulate plant development. In some soils, especially sandy soils, topdressing with an additional 25 to 50 lb of nitrogen after mowing will improve growth.

Research plots at the University of Massachusetts demonstrate the difference between sorghum-Sudangrass that was either mowed twice during the summer or left unmowed. Regrowth of the cover crop after mowing was shown to be stimulated by a light application of nitrogen fertilizer.



Mowing can be used to increase the extensive root system of these crops. Repeated mowing also causes the root system to penetrate deeper, helping to loosen compacted soil. Mowing can be done several times during the season depending on rainfall and management. Mowing is necessary to encourage tillering, increase vegetative growth, prevent seed head formation, and get maximum dry matter production.

Without mowing the crop can become unmanageable and hard seed may be set that will produce volunteer weeds in subsequent crops. When the crop gets to be about 3 feet tall it should be mowed, chopped, or flailed. The plants should not be clipped too closely (no shorter than 8 inches) or they may weaken or die. Frequency of mowing will depend on seasonal environmental conditions and fertility. At the end of the growing season the crop should be mowed again, just prior to a killing frost.

Green crop residue from young plants decomposes quickly. However, residues from older, larger plants decompose slowly due to their high carbon to nitrogen ratio. As older plant materials break down they may tie up available N in the soil, reducing availability to a crop that follows unless appropriate soil amendments are added.

In addition to competing for light, water and nutrients, sorghum-Sudangrass can help suppress weeds by releasing allelopathic compounds. The seedlings, shoots, leaves and roots all secrete compounds that suppress many weeds. The main root exudate, called sorgoleone, is quite potent, and has an effect even at low concentrations. As early as five days after germination, roots begin secreting this substance. Its effect can persist for several weeks, so care should be taken to wait for residues to decompose before direct-seeding sensitive crops like lettuce.

Some studies suggest these crops can be used to suppress certain species of nematodes, as a result of the release of nematicidal compounds during decomposition. For this purpose, it is important to finely chop and incorporate top growth into the soil when still it is still green and before a killing frost, then run a cultipacker across the field to firm the soil.

Flail-chopping sorghum-Sudangrass



Chopped residue ready for incorporation



Prussic acid poisoning is a concern if you plan on feeding these crops to livestock. The danger of poisoning is highest in the early growth stages and following a light frost. Do not pasture livestock until the crop is 18 to 24 inches tall, rotating pastures to prevent grazing of young regrowth, and removing livestock if new shoots develop after a partial kill by frost. Hay should be made when the grass is in the boot stage. Poisoning of horses has been reported; they should not be allowed to graze sorghum-Sudangrass, and they should never be fed the hay.

Related Links:

[Sorghums, Sudangrasses, and Sorghum-Sudan Hybrids – University of Wisconsin](#)

[Sorghum-Sudangrass chapter in Managing Cover Crops Profitably - SARE](#)

[Sudangrass and Sorghum-Sudangrass – Cornell University Cooperative Extension](#)

[Sudangrass and Sorghum-sudangrass Hybrids - University of Kentucky](#)

Updated 4/22