



# SUDANGRASS AND SORGHUM-SUDANGRASS HYBRIDS

(*Sorghum bicolor* L.)

R. Sattell, R. Dick, R. Ingham, R. Karow, and D. McGrath

Sudangrass and sorghum-sudangrass hybrids are frost-sensitive, warm-season, erect annual grasses. They can grow from 6–8 feet tall and produce large amounts of dry matter if planted in the summer well before the first frost. Their root systems are fibrous.

## Environmental preferences and limitations

Sudangrass and sorghum-sudangrass hybrids require warm weather to grow, and winter-kill with the first hard frost. Minimum air temperature for growth is 60°F, and optimum temperatures are from 75 to 90°F. Sudangrass and sorghum-sudangrass hybrids do best in southwestern Oregon, the Columbia River basin, and the Snake River basin. They also have been grown successfully as cover crops in the Willamette Valley, although cool night temperatures may reduce growth.

Although maximum growth occurs with ample moisture, sudangrass and sorghum-sudangrass hybrids are drought-tolerant. They also tolerate mowing, high pH, salinity, and partial shade.

## Uses

Sudangrass and sorghum-sudangrass crosses are used as warm-season cover crops, forage, and silage. When used as a cover crop, their fibrous roots and organic matter contributions improve soil structure; and their rapid, dense growth suppresses weeds.

When sudangrass and sorghum-sudangrass crosses winter-kill, they form a dense mat that protects the

soil surface and reduces weed emergence until the residues decompose. The partially decomposed residues are incorporated easily in spring. Growers have successfully used no-till and strip-till methods in combination with short-term residual herbicides to plant into the mulch formed by winter-killed sudangrass.

Note that although sudangrass and sorghum-sudangrass hybrids produce high-quality forage, at certain times they can poison livestock. Young plants and plants stressed by drought or light frost may contain hydrocyanic (HCN) acid, which is toxic to livestock. Do not graze young plants or regrowth following drought or frost stress.

## Dry matter and N accumulation

Sudangrass and sorghum-sudangrass crosses are capable of producing large amounts of dry matter. However, the amount of dry matter produced depends on how long they grow before being killed or winter-killed, and if the soil is dry, whether or not they are irrigated.

N content is low, in the range of 1 to 2 percent of dry matter. Although the total amount of N accumulated in plant residues may be considerable, because of

the high C:N ratio, very little or none of the N is available to subsequent crops.

## Management

Seeding rates for cover cropping range from 20–60 lb/acre. Best stand establishment is obtained by drilling seed to a depth of approximately 1 inch in a smooth, well-prepared seedbed. Although row spacing generally does not affect yield, narrow rows are better for cover cropping purposes. Alternative seeding methods that can reduce seedbed preparation but require higher seeding rates are: drill into a rough seedbed prepared by disking, or broadcast over a rough or smooth seedbed and then disk lightly to cover the seed.

Dry matter accumulation is very sensitive to planting date. During a normal year in western Oregon, sudangrass and sorghum-sudangrass

---

## Quick facts: Sudangrass

|                                |   |
|--------------------------------|---|
| <b>Common names</b>            | Sudangrass  |
| <b>Hardiness zone</b>          | 10, i.e., no frost tolerance (see Figure 1)   |
| <b>pH tolerance</b>            | Tolerates high pH, but optimum is near neutral  |
| <b>Flood tolerance</b>         | Low   |
| <b>Drought tolerance</b>       | High  |
| <b>Shade tolerance</b>         | No information  |
| <b>Mowing tolerance</b>        | High  |
| <b>Dry matter accumulation</b> | May be very high but depends on kill date   |
| <b>N accumulation</b>          | May be high but depends on kill date  |
| <b>N to following crop</b>     | Very little or none   |
| <b>Uses</b>                    | Use as summer annual cover crop to suppress weeds and improve soil tilth. May be planted in late summer and allowed to winter-kill.   |
| <b>Cautions</b>                | Needs hot weather to grow. Large amounts of dry matter require a long time to decompose sufficiently before planting subsequent crop. |

---

crosses planted in early August (following beans for example) and irrigated will attain heights of 6-8 feet before they winter-kill. But if they are planted in early September without irrigation they will grow to only 2 feet tall, and if planted in late September they will grow to only 6 inches tall before they winter-kill.

Sudangrass and sorghum-sudangrass planted in mixtures with legumes in early fall (early September in western Oregon) will winter-kill, forming a mulch that protects the soil surface during the winter but allows the legume to grow without competition in the spring. Planting too early can result in large amounts of residue that may smother the legume, and planting late results in minimal winter soil protection.

Sudangrass and sorghum-sudangrass crosses may be planted in the spring after soil temperatures reach 60°F, and killed or incorporated in early summer. If you plan to incorporate residues soon after the plants are killed, chop or flail them first. Succulent residues from young plants decompose quickly. However, residues from older, larger plants decompose slowly due to their high carbon:nitrogen ratio. When large amounts of residue are incorporated, N availability to the succeeding crop may decrease due to microbial competition for plant-available N during decomposition. You can reduce this problem by planting a

mixture of sudangrass and legumes in spring, planting a legume following incorporation, delaying planting the succeeding crop until residues have decomposed, or adding fertilizer N.

N availability to succeeding crops is not likely to be a problem if you incorporate residues that have been decomposing over the winter, or if you leave residues on the soil surface as a mulch rather than incorporating them.

### Pest interactions

Sudangrass and sorghum-sudangrass hybrids do not become weeds as long as they are not allowed to go to seed. Vigorous growth by these species smothers summer weeds. However, if air temperature is cool, growth is slow, and competition from weeds may be a problem.

Sudangrass cover crops can be used as part of a rotation to lower soil populations of Columbia root-knot nematode (*Meloidogyne chitwoodi*), which infects potatoes. Sudangrass varieties 'Trudan' and 'Sordan 79' are non-hosts of Columbia root-knot nematode (other varieties are poor hosts), and sudangrass residues release nematocidal compounds as they decompose. Incorporate sudangrass after it has been stressed (e.g., first frost or drought) to increase HCN production and maximize the nematocidal effect. Rotational control before potato often involves planting non-host summer crops for 1 or more years, as well as controlling host weeds and using sudangrass cover crops. Note that the

ability of sudangrass to decrease nematode populations is specific to the nematode type.

### Varieties/cultivars

Besides common sudangrass, many sudangrass and sorghum-sudangrass hybrids are available. 'Piper' is a sudangrass variety that is widely available, has been used in Oregon for many years, grows to a height of 8 feet, and is low in HCN.

'Trudan 8' is a sorghum-sudangrass cross that is widely available and has been used in Oregon for many years.

### For more information

#### World Wide Web

Orchard floor management information—<http://www.orst.edu/dept/hort/weeds/floormgt.htm>

OSU Extension Service publications—[eesc.orst.edu](http://eesc.orst.edu)

The University of California, Davis cover crop information—<http://www.sarep.ucdavis.edu/sarep/ccrop/>

#### Oregon Cover Crop Handbook

This publication also is part of *Using Cover Crops in Oregon*, EM 8704, which contains an overview of cover crop usage and descriptions of 13 individual cover crops. To order copies of EM 8704, send your request and \$5.50 per copy to

Publication Orders  
Extension & Station Communications  
Oregon State University  
422 Kerr Administration  
Corvallis, OR 97331-2119  
Fax: 541-737-0817



Figure 1.—Oregon plant hardiness zone map. Sudangrass normally will survive in **Zone 10** or any warmer zone; thus, it is not winter-hardy in Oregon. (Extracted from the USDA's national plant hardiness zone map, based on average annual minimum temperature in °F.)

Zone 4 = -30 to -20; Zone 5 = -20 to -10  
Zone 6 = -10 to 0; Zone 7 = 0 to 10  
Zone 8 = 10 to 20; Zone 9 = 20 to 30

© 1998 Oregon State University. This publication may be photocopied or reprinted in its entirety for noncommercial purposes.

Robert Sattell, faculty research assistant in crop and soil science; Richard Dick, professor of soil science; Russ Ingham, associate professor of botany and plant pathology; Russ Karow, Extension cereals specialist; and Dan McGrath, Extension agent, Willamette Valley; Oregon State University.

Funding for this project was provided by the Oregon Department of Agriculture.

This publication was produced and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Extension work is a cooperative program of Oregon State University, the U.S. Department of Agriculture, and Oregon counties. Oregon State University Extension Service offers educational programs, activities, and materials—without regard to race, color, religion, sex, sexual orientation, national origin, age, marital status, disability, and disabled veteran or Vietnam-era veteran status—as required by Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, and Section 504 of the Rehabilitation Act of 1973. Oregon State University Extension Service is an Equal Opportunity Employer.

