



GROWING SUDANGRASS AND SORGHUM-SUDANGRASS CROSSES IN WASHINGTON

EB1507

Robert Parker, David Evans, Kenneth Morrison, Robert Stevens, Thomas Ley and Steven Fransen

Sudangrass, *Sorghum bicolor* (L.) Moench, is an annual warm season grass widely grown in the United States for pasture, green chop, silage, hay, and sometimes green manure. It was first introduced in 1909. Interest in sudangrass has increased as a result of sorghum-sudangrass hybrid development .

The hybrids offer increased vigor and higher forage yields, a particular advantage when they are harvested for silage and hay. Sudangrass and sorghum-sudangrass hybrids are adapted to the irrigated areas of Washington, to certain areas west of the Cascades, and to higher rainfall areas east of the cascades. Warm summer temperatures and adequate moisture are essential for best production. Sudangrass and hybrids do not grow well at cold temperatures and are very frost sensitive.

In the irrigated areas, sudangrass and sorghum-sudangrass crosses can be successfully used as a full season crop or as a second crop following harvest of peas, early potatoes, or other early harvested crops. In the high rainfall areas of Washington, these grasses may be seeded on summer fallow for spring and early summer pasture before the land is prepared for fall grain. They may also be used as a catch crop if a spring crop fails.

Sudangrass and sorghum-sudangrass crosses provide excellent temporary pasture. Seedings made in late May or early June will provide three to four grazings. Harvests can also be taken for hay or silage. Total yields generally increase as harvesting is delayed from vegetative through boot, flower and dough stages; however, protein concentration decreases. Hay probably should be supplemented with the necessary protein and concentrates. Thick stems and heavy growth can make hay hard to cure. conditioning and turning are usually necessary for hay production.

Leave a 6- to 8-inch stubble to promote regrowth. Close cutting may reduce or eliminate further production. Avoid cutting under drought or other adverse growing conditions.

Sudangrass and sorghum-sudangrass crosses can form hydrocyanic acid (HCN) or prussic acid when cells are disrupted by grazing, cutting, or frost. Varieties differ in HCN production potential. The greatest danger of poisoning will occur when over-hungry animals graze new shoot regrowth following frost or drought. The major danger of frosted sudangrass or sorghum-sudangrass crosses comes from the high accumulation of HCN containing compounds produced in young regrowth; levels drop in older vegetation. The hay making or silage making process thus reduces danger of poisoning. Beef cattle, dairy cows, or sheep can graze true sudangrass with little danger of poisoning

when it is 18 to 24 inches tall, provided that stands are managed to avoid letting livestock graze young regrowth.

Steers on sudangrass pasture at the WSU Prosser Irrigated Agriculture Research and Extension Center have gained 1³/₄ pounds per day and 300 pounds of beef per acre during the growing season .

Sudangrass silage yields are less than corn silage yields under irrigation in Washington. At Prosser, sudangrass has yielded 24 tons of silage per acre. Data from 2 years of variety testing at Prosser indicate no advantage for sorghum-sudangrass hybrids compared with Piper sudangrass, when cut at the pasture or late pasture stage (28 to 38 inches for Piper). Piper and the high yielding hybrids were equivalent, each having dry matter yields of 3 to 4 tons per acre, depending on the year. Tests in California indicate similar results. Only if harvest was delayed until the later-maturing hybrids reach 50% boot stage and 7 to 9 feet in height did the California trials show a distinct yield advantage for the sorghum-sudangrass hybrids over sudangrass.

In western Washington, sudangrass has yielded 1 .1 tons of dry matter per acre.

Fertilization

Sudangrass and sorghum-sudangrass crosses require adequate nitrogen fertilization to ensure maximum yield. Phosphorous, potassium and other nutrients may also be needed by the crop. Have your soil tested to determine if there is a need to add these nutrients, and if so, how much. Refer to FG0036, Fertilizer Guide: Irrigated Sudangrass Pasture or Silage.

The potential yield of the grasses is closely related to the date of seeding in central Washington. The rate of nitrogen to apply is, therefore, also related to the planting date.

| Total amount of Nitrogen (N) needed when seeded on seeding date. | |
|--|----------------------|
| Seeding date | Amount of N per acre |
| 1st week in May | 160 |
| 1st week in June | 100 |
| 1st week in July | 60 |
| 1st week in August | 40 |

If the grass is seeded following an early spring crop, sample the soil to determine residual nitrogen still available. For early spring seeding outside the irrigated area, 60 pounds of available nitrogen per acre may be adequate. Incorporate broadcast fertilizer to a depth of 3 to 4 inches during seedbed preparation. Iron deficiency may be a problem in some areas, especially with high soil pH.

Apply an additional 50 pounds of available nitrogen per acre after each cutting where moisture is available and if other growing conditions will permit 3 to 4 weeks of regrowth. Application through the irrigation system can be used successfully on these grasses.

Additional guidelines for fertilizer requirements can be obtained from FG0036, *Fertilizer Guide: Irrigated Sudangrass Pasture or Silage*.

Irrigation

Sudangrass and sorghum-sudangrass crosses can be either sprinkle or furrow irrigated. When the crop is grown for hay, silage, or as a green manure crop,

top growth can exceed 5 to 7 feet. In this case, furrow (rill) irrigation or center pivot sprinkle (using sprinkler heads mounted on top of the lateral) irrigation are adaptable methods. Hand and wheel-move systems are adaptable when the crop is grown for pasture, although system movement may be difficult when growth exceeds 30 inches.

If furrow irrigated, form the irrigation furrows before sudangrass or sorghum-sudangrass crosses are seeded. Light ditching may be required after seeding. Make the irrigation furrows from 28 to 36 inches apart, depending on soil type. The closer spacings may be preferred on sandy soils. Furrow irrigation runs should be short enough and furrow stream sizes large enough so that water reaches the ends of the furrows in one-fifth to one-fourth of the total irrigation time. Furrow stream sizes should not be so large, however, as to cause excessive soil erosion.

Ideally, irrigation should occur prior to seedbed preparation and should fill the soil profile in the expected root zone to field capacity. Sudangrass and sorghum-sudangrass crosses can be expected to have a 3-foot effective rooting depth at maturity if soil depth and/or structure are not limiting. As the crop develops from the seedling stage, the root zone depth expands from less than 6 inches to 3 feet or more. Thus, light, frequent irrigations which do not cause deep percolation of water are needed early. Time irrigations so that no more than 50% of the available water in the root zone is depleted between irrigations. Total water requirements will depend upon planting date and planned crop use. These may range from 14 to 25 acre-inches in irrigated eastern Washington.

Seeding

In the irrigated areas of the Columbia Basin, sudangrass and sorghum-sudangrass crosses may be seeded any time from May 1 to August 1. In western Washington and the nonirrigated areas of eastern Washington, they should be seeded before June 1. Sudangrass and sorghum-sudangrass crosses are warm season crops and should be planted after the soil warms. A good rule to follow is to plant at corn planting time.

Use certified seed of a low prussic acid variety. Piper sudangrass is a good variety for Washington. It is high yielding and low in hydrocyanic acid.

On irrigated land, use 30 to 35 pounds of seed per acre for sudangrass; more may be needed for larger seeded hybrids. On nonirrigated land, use 20 to 25 pounds of seed per acre.

A regular grain drill is best for seeding. The seedbed must be firm, moist, and finely granular. Rows can be spaced as close as 6 inches apart for sudangrass under irrigation and up to 18 inches for sorghum-sudangrass hybrids or on nonirrigated soils. The seeding depth should be $\frac{3}{4}$ to $1\frac{1}{2}$ inches on irrigated soils, and into moisture on dryland soils, but not deeper than 3 inches.

Weed Control

Sudangrass and sorghum-sudangrass crosses are excellent competitors against weeds because of their height, but weeds must be controlled in seedling stands to obtain maximum production. Proper seedbed preparation and periodic cultivation, if forage is planted in widely spaced rows, will help control weeds. Broadleaf weeds can be controlled by applying 2,4-D amine at $\frac{1}{4}$ to $\frac{1}{2}$ pound acid equivalent per acre when the grass is 4 to 8 inches tall. Atrazine also is registered for weed control on the sorghum-sudangrass crosses.

Pasturing Livestock and Harvesting Hay

Pasture livestock when grasses are 18 to 36 inches high; do not allow grazing before the grasses are 18 inches high. Where moisture is available for regrowth, use a rotational grazing system. Divide the fields into small pastures so that livestock can graze a pasture down in 1 week yet leave a 6- to 8-inch stubble. Sudangrass should have 3 to 4 weeks regrowth between grazing periods. You may pasture livestock on sudangrass until frost in the fall. It is a good idea to provide supplemental feed before turning livestock into sudangrass for the first time.

In some sections of the country, sudangrass and sorghum-sudangrass crosses contain enough HCN to kill livestock. Washington tests have not shown high concentrations of HCN. The danger of poisoning is highest in the early stages of growth and after a light frost. This is the basis for recommending 1) against using sudangrass to pasture livestock until it is 18 to 24 inches high; 2) rotating pastures to prevent grazing of young regrowth; and 3) removing livestock if new shoots develop after sudangrass has been partially killed by frost until subsequent frosts kill the new shoots.

The major danger of frosted sudangrass or sorghum-sudangrass plants comes from the high concentration of HCN in young growth. If you have doubts about pasture safety, turning in one or two older animals as "testers" is possible. Pigs can be pastured on immature sudangrass, but do not allow horses to graze sudangrass, and do not feed them the hay.

Hay should be made when the grass is in the boot. Nutrient concentration is generally lowest in the flower stage and increases with seed formation, so silage may best be made in the soft dough stage.

Growing Sudangrass for Seed

Sudangrass can be grown for seed in the irrigated areas of eastern Washington.

When using adequate fertilizer and early seeding, 1,000 pounds of seed per acre can be grown under irrigation. On dry land, 250 to 500 pounds of seed can be produced per acre.

Highest yields can be obtained if sudangrass is seeded in rows and cultivated. Sudangrass should be planted during May. Plantings made after June 1 may not mature.

Nitrogen application rates on sudangrass grown for seed will be similar to rates used for pasture or silage. Have your soil tested to determine the need for phosphate and potassium.

Prepared by Robert Parker, Extension Weed Scientist, and David Evans, Agronomist, Washington State University Prosser Irrigated Agriculture Research & Extension Center; Kenneth Morrison, WSU Extension Agronomist deceased; Robert Stevens, Extension Soil Scientist, and Thomas Ley, former Extension Irrigation Engineer, WSU Prosser Irrigated Agriculture Research & Extension Center; and Steven Fransen, Extension Agronomist, WSU Prosser Research & Extension Center.

Use pesticides with care: Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in

their original containers and keep them out of the reach of children, pets, and livestock.

Issued by Washington State Cooperative Extension, and the U.S. Department of Agriculture in furtherance of the Acts of May 8 and June 30, 1914. Cooperative Extension programs and policies are consistent with federal and state laws and regulations on nondiscrimination regarding race, sex, religion, age, color, creed, national or ethnic origin; physical, mental or sensory disability; marital status, sexual orientation, and status as a Vietnam-era or disabled veteran. Evidence of noncompliance may be reported through your local Cooperative Extension office. Trade names have been used to simplify information; no endorsement is intended. Published September 1988 \$1.00

EB1507

Buy online at pubs.wsu.edu

[Top](#)

[Disclaimer](#)

[HOME](#)
[WSU](#)

Questions or comments? Contact Rebecca Steever at rsteever@wsu.edu.