

ON THE SOIL HORIZON

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Sudangrass: Harvesting the Summer Heat

PROFILE

- Sudangrass is an important warm season forage crop
- ID plant growth stage before each harvest
- Multiple harvests require optimal nitrogen fertilization

Sudangrass is a warm season annual that is tolerant of drought and high temperatures, common features of California's climate in the summer months. The cool and very wet spring we experienced this year in Stanislaus County has rapidly given way to a more "typical" hot and dry summer. The ability of sudangrass to thrive under these hot and dry conditions makes it a good option for producing high quality forage during the heat of the summer. Stanislaus County is one of the top sudangrass producing counties in California, typically accounting for 5% of the crop's value statewide with 8,500 acres harvested each year.



'Piper' Sudangrass

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The true sudangrass 'Piper' has been grown in the United States since 1909; however, true sudangrass hybrids and sorghum-sudangrass hybrids have since been developed to achieve smaller stem diameter, increased leafiness, and improved disease resistance.

The fibrous root system of sudangrass enables the plant to efficiently use applied irrigation water and the narrow leaves help reduce water loss from the plant. While sudangrass is regularly grown in Stanislaus County as a forage crop, it can also be used as a warm season cover crop that adds near-surface and belowground organic matter to soils. The fibrous root system grows densely near the soil surface, helping to retain applied fertilizer nitrogen, limit the buildup of soluble nitrogen in the soil profile, and reduce total nitrate leaching.

Sudangrass and sorghum-sudangrass hybrids can be used as pasture for a grazing herd, cut for hay, ensiled, or used as "green chop" (harvested green and used immediately), ensuring a range of options for producing forage for livestock at different times throughout the summer. Multiple harvests, or cuttings, of sudangrass can be made during a single growing season and harvest timing will change depending on whether sudangrass is used as pasture, hay, silage, or "green chop" forage. Therefore, it



Sorghum-Sudangrass (credit: F. Baca)

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is necessary to match your harvest schedule to the type of forage produced in order to achieve optimal yield and nutritional value.

Growth and Yield

Sudangrass will grow to a height of seven feet, while sorghum-sudangrass is slightly taller and will grow to approximately nine feet at heading. Sudangrass grown in Stanislaus County is typically harvested at least three times during the summer with each harvest yielding between three to five tons of hay per acre.

Harvest Timing

Forage production management decisions are made when plants reach specific growth stages during the season. Identifying the different plant growth stages of sudangrass and sorghum-sudangrass is important for obtaining high yields and nutritional quality. Additionally, sudangrass and sorghum-sudangrass have plant compounds (prussic acid) and nutrients (nitrate) within the leaves that can accumulate at different growth stages and pose a risk to animal health. Knowing when (or when not) to harvest sudangrass or sorghum-sudangrass is an important management decision impacting forage productivity and animal health.

*In general, it is recommended to use sudangrass or sorghum-sudangrass for: **pasture** when plant height reaches 18 to 24 inches; **hay** when plants reach the late boot growth stage; **green chop** when plants reach at least 18 inches and prior to heading; **silage** when plants reach*

the soft dough stage.

Fertilization and Regrowth

Sudangrass and sorghum-sudangrass can be very efficient scavengers of soil nitrogen. As mentioned earlier, this has led to the increased adoption of sudangrass as a warm season cover crop. *When used as forage, it is important to support the initial growth and subsequent regrowth with optimal levels of plant available nitrogen during the summer. Nitrogen fertilization of sudangrass should consider recent soil nitrogen test results, current production practices, and how much nitrogen the crop removes with each harvest.* Optimizing harvest timing and nitrogen fertilization of sudangrass and sorghum-sudangrass helps to ensure each cutting continues to be productive throughout the heat of the summer.

Production and Management Resources:

Sudangrass Production - University of Arizona Cooperative Extension:

<https://cals.arizona.edu/forageandgrain/sites/cals.arizona.edu/forageandgrain/files/az1664-2015.pdf>

Sudangrass Fertilization - University of California Cooperative Extension:

<https://ucanr.edu/sites/CEStanislausCo/files/111041.htm>

Hemp on the Horizon

PROFILE

- Hemp can be grown for seed, fiber, or oil
- Hemp production has started this year in Stanislaus County
- Approximately 168 acres of hemp are expected to be grown in 2019

The saying, “everything old is new again,” seems to perfectly describe the excitement around growing this “new crop.” Hemp, also known as industrial hemp, was grown early in this country’s history and was thought to be the next boon for America’s agricultural economy in the 1930s. However, mounting social pressure led to the passage of a strict federal tax in 1937, effectively halting the production of hemp. It was not until 2014 that interest in hemp production began to rebound with federal approval of state-regulated research programs. Recently, the 2018 Farm Bill opened up the potential for hemp to be grown for commercial purposes across the country.

California is required under federal guidelines to have a regulatory plan in place to register commercial hemp growers. The registration forms found on the [California Department of Food and Agriculture website](#) are sent to the county where hemp is to be grown and processed by the Agricultural Commissioner’s Office. Growers can only register to plant approved hemp cultivars and must include a \$900 annual fee per application at the time of registration.

Hemp in Stanislaus County

Stanislaus County will also issue a license to all registered growers to ensure the legal requirements of producing hemp have been met. The licensing program will be used to recover plant sampling, analysis, evaluation, and disposal costs. This licensing program will also help document county-level compliance with hemp production practices. The Agricultural Commissioner’s Office will authorize one license per person or business to parcels of at least 10 acres

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within the A-2 zoning district, but outside the sphere-of-influence and/or urban transition designation. The current license under the “pilot” phase restricts hemp production in Stanislaus County to a maximum of 12 cultivated acres. The initial “pilot” phase of hemp cultivation allows production to begin this year and should give county-level program administrators a better understanding of the financial impact of hemp regulations in Stanislaus County.

Growers interested in participating in the “pilot” phase of hemp production in Stanislaus County had until the July 18 deadline to complete the license and registration process. *As of the writing of this article (July 15), the Stanislaus County Agricultural Commissioner’s Office received 83 calls about hemp production. A total of 20 growers completed the registration process, and 17 of these growers also completed the licensing process. These 17 growers will be ready to plant hemp this year. This means approximately 168 acres of hemp can be grown for the “pilot” phase of production in Stanislaus County in 2019.*

Hemp Agronomics

Hemp is a type of cannabis that has low THC content (< 0.3%) and is used to produce different agricultural commodities (fiber, seed, or oil). The agronomics of hemp have historically been limited to small-scale production information obtained from [established agricultural research institutions](#). While limited in size and relevance to California’s cropping systems, these general recommendations provide a way for beginning growers to get started with hemp production. The lessons learned from these initial years can then be used as the basis for improving and fine-tuning management practices based on local growing conditions.

The type of production system used to grow hemp will depend on whether the crop is harvested for fiber, seed, or oil. Hemp can be drill-seeded, broadcast-seeded, or transplanted and grown for a wide variety of products and end-uses. **Hemp grown for fiber** can be used to produce cloth, rope, or animal bedding, while **hemp grown for seed** can be consumed as an added source of protein in various food products. The biggest market potential appears to be for **hemp grown for oil**, specifically cannabidiol oil (CBD oil), a product that has recently been approved for medicinal purposes.

Hemp grown for fiber is often planted in narrow rows to discourage branching and encourage growth of the fibrous stems that can reach a height of 13 feet. When grown for

seed, shorter plants are preferred (6 to 10 feet) which facilitate harvest operations, and when grown for CBD oil, wider spaced plantings of only female plants are preferred to encourage branching and flower production. Hemp grown for CBD oil should be isolated from pollen drift to avoid flower pollination and seed production.



University of Wisconsin Extension
Hemp Research (credit: B. Luck)

The Hemp Learning Curve

While there are general guidelines available to help get hemp production started, future success and increased productivity will require identifying practices that make sense in Stanislaus County. This year, growers in the “pilot” phase can begin building networks and learning from one another about how to optimize hemp production. Bringing new acres into production will require learning from growers with more experience. Our ability to support and sustain this “new crop” in Stanislaus County will improve as growers, the industry, and researchers build on lessons learned from these initial years of production. The University of California Cooperative Extension office in Modesto is here to help answer your hemp management questions. Interested in conducting hemp research on your farm? Please contact Anthony Fulford, Nutrient Management and Soil Quality Advisor in Stanislaus County at (209) 525-6825 or email at amfulford@ucanr.edu

Hemp Production Resources:

California Department of Food and Agriculture

Frequently Asked Questions (FAQ):

<https://www.cdfa.ca.gov/plant/industrialhemp/faq.html>

2019 Registration Forms for Growers and Seed Breeders:

<https://www.cdfa.ca.gov/plant/industrialhemp/>

Stanislaus County

Licensing Information:

<http://www.stanag.org/industrial-hemp.shtm>

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