



Stargrass

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Stargrass (*Cynodon nlemfuensis*) is a tropical grass from East and Central Africa, where it is a pioneer plant on disturbed lands. It has been introduced to other parts of the tropics and subtropics primarily as a fodder grass. In Hawaii it can be used as a cover crop in sunny parts of orchards and other open areas of the farm. Its drought tolerance makes it a good choice for leeward locations. Although stargrass must be grown from stolons or stem pieces, it grows quickly and fills in soon after planting, providing long-term weed suppression with minimal chemical inputs. Because it is palatable to livestock, stargrass can add to a farm's sustainability when used for rotational grazing, especially when interplanted with low growing legumes.

Characteristics

Stargrass is a long-lived, perennial grass adapted to tropical and subtropical conditions. It lacks rhizomes, spreading by means of woody stolons that lie flat on the ground. Its stems are 12–24 inches (30–60 cm) tall and 1–3 mm in diameter at the base. The leaf blade is a flat, elongated sword shape, 2–6 inches (5–16 cm) long and about $\frac{1}{16}$ – $\frac{3}{16}$ inch (2–5 mm) wide. Each inflorescence has a single whorl of four to nine spikes that are $1\frac{1}{2}$ – $2\frac{3}{4}$ inches (4–7 cm) long. Small forms of *C. nlemfuensis* can be mistaken for bermudagrass (*C. dactylon*); stargrass is less hardy, and unlike bermudagrass, it has no underground rhizomes.

Environmental requirements

While stargrass grows on a wide range of soil types, it grows best in moist but well drained soils. The soil pH range for stargrass is between 5 and 8. Stargrass can grow where annual rainfall ranges from 20 to 80 inches

Benefits provided by stargrass

GOOD for providing erosion control, for quick growth and establishment, for weed suppression

TOLERATES drought but not shade

ESTABLISH vegetatively; seed not available

FAIR quality forage for animal grazing systems (production, nutritional quality, and palatability)

USE IN plantation and orchard cropping systems (macadamia, coffee)



(500–2000 mm). It does not tolerate prolonged flooding, but it can withstand waterlogging for 2–3 days. It has very good drought tolerance and may be a good choice for drier areas. Its shade tolerance is poor. In Hawaii, stargrass grows year round at elevations ranging from sea level to 3000 ft, according to the USDA Natural Resources Conservation Service (NRCS).

Cultivars

'Florico' (originally from Kenya) and 'Southpoint' are cultivars commonly recommended by NRCS for Hawaii.

Establishment

Plant sprigs (above-ground stems) or stolons (runners) at a rate of 1000 lb/acre with a maximum 3 x 3 ft spacing. A uniform planting will result in the best stand establishment. It is recommended to plant in fields that are free of bermudagrass. Where bermudagrass was present, increase the planting rate of stolons to 1500 lb/acre. A solid stand of stargrass 24 inches high can be obtained in 90 days after planting under good conditions.

Establishment is most successful in a well prepared seedbed. The areas to be planted must be moist and irrigated, as the sprigs and newly established plants are susceptible to drought.

For optimum establishment and growth, stargrass should be fertilized heavily. Its fertilizer requirement is similar to pangolagrass or bermudagrass and greater than digitgrass or bahiagrass. Recommended fertilizer rates for establishment of the crop is about 35 lb/acre each of N, P, and K, with an additional 30–40 lb/acre N applied about 30 days later.

Although stargrass has a rapid rate of establishment, some weed control may be required initially.

Uses

Weed control

Stargrass helps reduce weeds by establishing quickly and outcompeting weeds. Its mat-like growth habit makes it a good tool for reduced-chemical or nonchemical weed control. The plant is very persistent once it is well established.

Erosion control and soil quality improvement

Stargrass contributes to a farm's sustainability as a soil conservation tool to preserve valuable topsoil on sloping fields. Significant soil quality benefits, such as improved soil structure, better water infiltration rates, and increased water-holding capacity, result from the use of permanent cover crops such as stargrass.

Rotational grazing

Stargrass can be grazed or harvested for hay. The hay cures rapidly in favorable weather. However, stargrass produces little forage during periods of drought stress. A stargrass stand will persist well if maintained under a rotational grazing program, where it is grazed from plant

heights of 12–28 inches to a stubble height of 6–10 inches. To maintain stand persistence, allow a 4–5 week resting period between grazing or cutting.

Stargrass contains high levels of prussic acid, but with care it can be used for pasturing animals. Digestibility of stargrass is similar to that of pangolagrass. Stargrass is most nutritious when grazed every 4–5 weeks. Average dry matter production of 'Florico' and 'Florona' stargrass in southwestern Florida trials was about ?? tons/acre (4.7 metric tons/??acre??). Dry matter produced by these same varieties when the grass was grazed at 5-week intervals was 6.6 tons/acre/year compared to 4.4 for 'Pensacola' bahiagrass and 3.1 for pangolagrass. The average livestock weight gain from feeding on 'Florico' stargrass in the Florida studies was 720 lb/acre/year.

Grow stargrass with low growing legumes to improve forage quality and reduce the harmful effects of its prussic acid content. Good results are reported with *Stylosanthes guianensis*, *Centrosema pubescens*, *Trifolium repens*, and *Lotononis bainesii*. In Brazil, stargrass has been intercropped with perennial peanut (*Arachis pintoi*).

Cover crop maintenance

Stargrass requires little fertilizer, but dry matter yield will increase with N fertilizer applications. A suggested maintenance fertilizer program for stargrass cut for hay is about 70 lb/acre each of N, P, and K applied 4–6 weeks before each cutting.

Management cautions

The initial cost of establishing stargrass is high due to the labor cost for sprigging. If propagation material is limited and the area to be planted is large, it may be necessary to establish a nursery as a source of planting material. Stargrass is not suitable for shaded conditions. It does not tolerate prolonged periods of flooding, but it can withstand 2–3 days of water in the soil surface. When pasturing animals on stargrass, beware of potential prussic acid poisoning. High prussic acid content can occur one month after a heavy (over 100 lb/acre) N fertilizer application anytime during the growing season. Forage quality drops after 6 weeks of growth since the last grazing or harvest.

Pest problems

The major diseases of common stargrass are rust and *Helminthosporium* leaf-spot. Stargrass has been found to be susceptible to late blight (*Rhizoctonia solani*) in Florida, but attacks have been sporadic, and it has not become a disease of economic importance for stargrass there.

The fall armyworm (*Spodoptera frugiperda*) and spittlebug (*Prosapia bicinata*) are the major insects attacking stargrass. The strip grass looper caterpillar (*Mocis latipes*) is also a problem in Florida. Because several nematodes attack stargrass, vegetable and ornamental farmers need to be careful that important nematode pests do not build up in soil under stargrass if the field will subsequently be used for vegetable or ornamental crops susceptible to nematodes. Nematodes found to attack stargrass in Florida included the stubby root (*Trichodorus*), spiral (*Helicotylenchus*), stealth (*Hemicycliophora*), ring (*Hemicriconemoides*), stunt (*Tylenchorhynchus*), awl (*Dolichodorus*), and lance (*Hoplaimus*) nematodes.

For assistance:

Contact your nearest Cooperative Extension Service office for additional assistance in selecting appropriate cover crops and green manures for your farm and cropping situation. Help can also be obtained from the USDA Natural Resources Conservation Service field offices located on each island.

Visit CTAHR's Sustainable Agriculture for Hawaii Program Website at <<http://www.ctahr.hawaii.edu/sustainag>> to find additional information about green manure and cover crops. The site also includes references and links to other useful on-line resources.



Sustainable Agriculture in Hawaii . . .

. . . integrates three main goals—environmental health, economic profitability, and social and economic equity. Sustainable farms differ from conventional ones in that they rely more on management practices such as crop diversification and crop rotation, agroforestry, integrated pest management, rotational grazing, and innovative marketing strategies. For further information on Sustainable Agriculture in Hawaii, contact:

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