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PANGOLA GRASS IN HAWAII

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(All illustrations by E. Y. Hosaka)

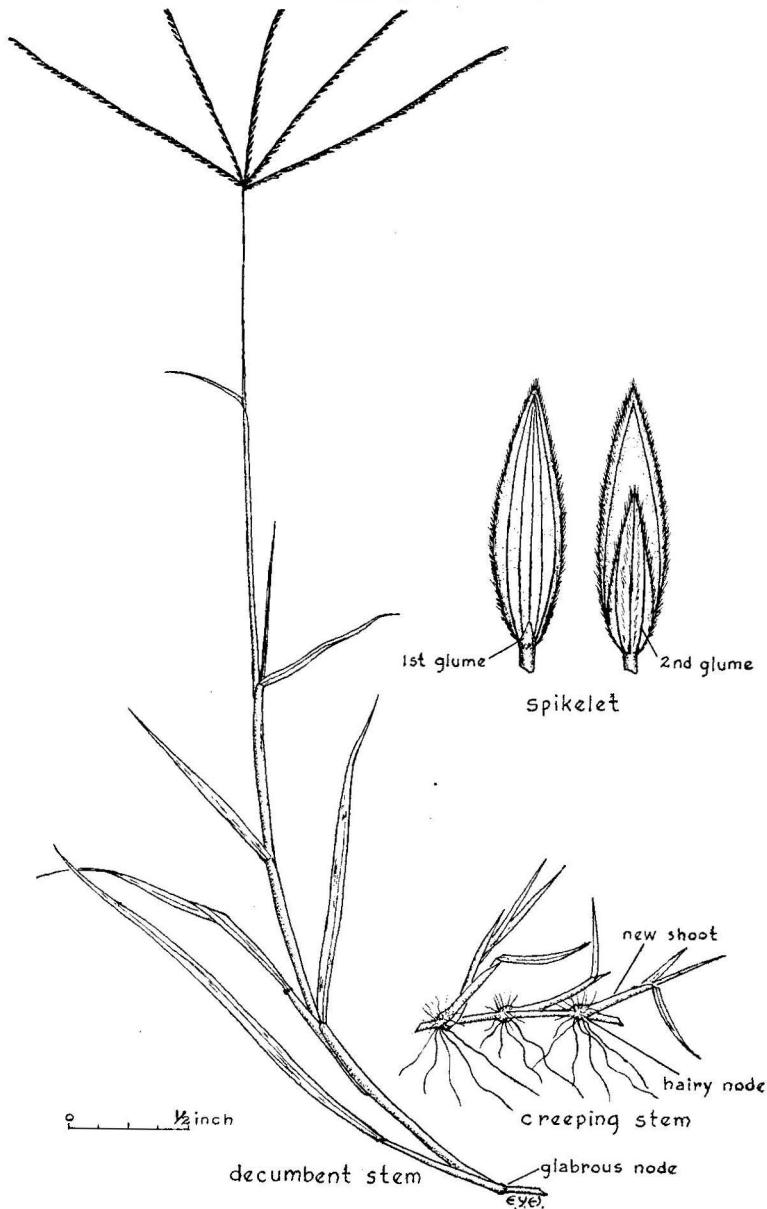


Figure 1. Pangola grass.

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PANGOLA GRASS IN HAWAII

Pangola grass (*Digitaria decumbens* Stent.) is a native of South Africa and from there it was introduced into the United States during the early 1930's (fig. 1). Florida has the largest planting of this grass, with over a million acres.

In November 1950 a small patch of pangola grass was accidentally found in a pasture at Kamuela, Hawaii, and Hosaka exhibited a few runners of this grass at the December meeting of the Hawaii Cattlemen's Association held in Barbara Hall, Kamuela, of the same year. He pointed out some of the promising characteristics of this grass and discussed its performance in Florida. After the meeting the specimens were given to Herbert Shipman of Hilo and Charlie Rice of Kauai. A few weeks later a handful of sprigs was sent to Fred Conant, manager of Princeville Plantation Ranch (fig. 2) on Kauai.

Some of the people who are responsible for making this grass popular in Hawaii are George P. Cooke of Molokai, Fred Conant of Kauai, and Herbert Shipman, William Payne, George Vierra, Joe Pacheco, and Tony De Luz of Hawaii (fig. 3). In 1951 the Hawaii Agricultural Experiment Station brought in a few sprigs of pangola from Georgia and grew it under quarantine for a year. When the plant was released in 1952 it was planted in a nursery plot at the University Farm.

The University of Hawaii has pangola planted with other forage species in grass gardens on the different islands for the distribution of vegetative seed stocks to ranchers and other interested people. This grass is becoming very popular in the moderate to wet pasture lands of Hawaii. Many ranchers in the Territory have planted this grass and say that it is a good productive grass in regions where it is adapted.

DESCRIPTION OF PLANT

Pangola is a creeping to decumbent, long-lived grass that grows to a height of 2 to 4 feet. The creeping stems have conspicuously hairy nodes, whereas the decumbent stems have smooth nodes. It forms a thick mat (fig. 4). The vigor and growth depend on soil fertility. The fruiting stalks produced on the decumbent stems extend far beyond the top leaves. Abundant flowers are borne on finger-like branches, but very few viable seeds, if any, are produced. Spikelets are about $\frac{1}{8}$ inch long. Stems that touch the ground root readily at the nodes. The weak stems are $1/16$ to $3/16$ inch in diameter. Leaves are 5 to 9 inches long and about $\frac{1}{4}$ inch wide, smooth on both sides.

The ability to produce long runners, 10 to 20 feet long, in a few months is an excellent quality of this grass. The newly planted sprigs first send out runners, with internodes as much as 8 inches long, in all directions. This faculty to cover open ground rapidly is a desirable characteristic for preventing soil erosion and the encroachment of undesirable plants.

Pangola has about 20 percent dry matter at maturity, and the animals relish it even when the stems are partly dry. Richard Sloggett of Kauai says that he

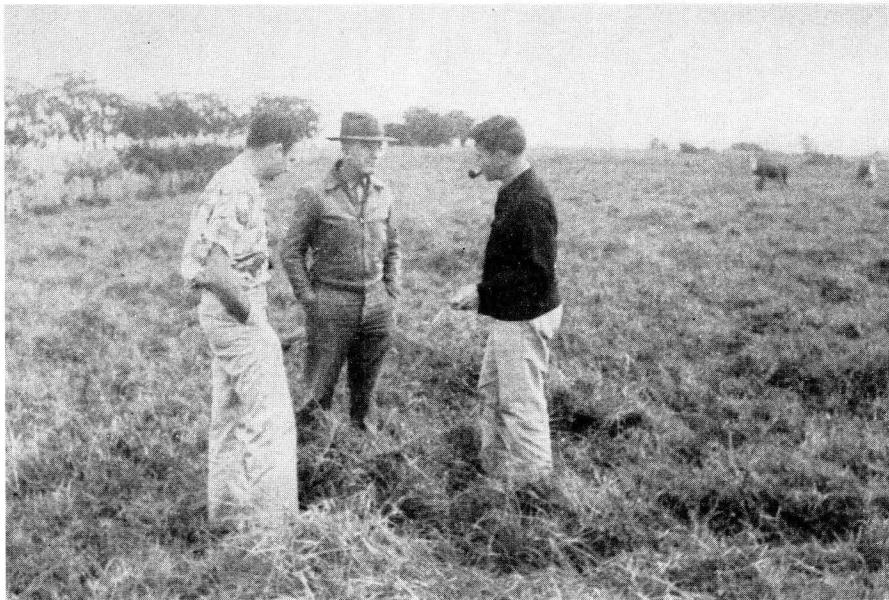


Figure 2. First large pangola planting at Princeville Plantation Ranch on Kauai being inspected by Dale Goodell, Fred Conant, and Kelsey Ordway (left to right).

Figure 3. Ranchers inspecting George Vierra's 2-month-old pangola planting at Kamuela, Hawaii.



saw huge dehydrating plants in Florida making pangola hay. Farmers in Florida told him that pangola hay is very palatable and nutritious.

Recently a giant strain of pangola grass was found in the Hilo district. The stems are larger in diameter, and the leaves are twice as wide and longer than the common pangola grass. The wide leaves have a bluish tinge on the surface. This new strain of pangola might also become an important forage plant in Hawaii.

ADAPTATION

Pangola grass is well adapted to the Hawaiian climate, and plantings from sea level to 5,000-foot elevations have done remarkably well. Performance in dry regions and in flooded lands is poor, but under irrigation in dry climate it makes heavy growth. Pangola grass has been established on poor soils, but the growth has been rather slow as compared to plants established in fertile soils. Adequate moisture is an important factor for continuous forage production. Plantings at Hanalei on Kauai, Haiku and Hana on Maui, and Hamakua, Paauhau, Kona, and Kamuela on Hawaii are doing well.

Pangola grass responds to complete fertilizer and lime. Phosphate is the most important element, and without it the grass makes poor growth and establishment is extremely slow. Properly fertilized, pangola will yield annually 50 tons or more of green forage per acre. One cutting at Kamuela and Haiku gave 13 tons of green feed per cutting.¹ Florida has produced 59,847 pounds of green forage per acre per year with heavy fertilization.²

Pangola is free from any plant diseases.

IMPORTANCE AS A PASTURE PLANT

Pangola grass is one of the most popular forage grasses in Florida, and thousands of acres of new pastures are planted to this grass every year. It has also become the most popular grass locally in the last 2 years. In this short period over 3,000 acres of grazing lands have been planted to pangola grass.

Fred Conant, with the largest solid planting of pangola, is very enthusiastic about this grass and has raised some fine cattle on pangola pastures. He said that 25 young heifers and old cows that came out of carpet-yellow foxtail pasture in a very poor condition made excellent recovery in a few months when they were put in pangola pasture. Tony De Luz, ranch foreman of the Hamakua Mill, has fattened some excellent steers on pangola. Parker Ranch grazed some yearling steers on pangola grass in the Paauhau section with good results.

Some ranchers were able to graze as many as four head to an acre of pangola for a few months before reducing the number. A grazing test conducted in Florida showed that pangola grass compares favorably in beef yield per acre with coastal Bermuda grass and Pensacola Bahiagrass.³

Some of the good qualities of pangola as a pasture plant are its palatability even at maturity, its quick recovery after grazing, its aggressiveness to compete with less desirable plants, and its ability to produce new shoots from the rooted nodes through a thick mat of plants. When Jack White's dairy cattle of different ages were allowed to go into the Kamuela Agricultural Extension Service grass garden to determine their species preference, the animals selected pangola and

¹ Communication with David Akana, County Agent.

² BAIR, R. A., AND R. W. KIDDER. PASTURE INVESTIGATIONS ON THE PEAT AND MUCK SOILS OF THE EVERGLADES. Fla. Agr. Expt. Sta. Rpt., p. 206. 1945.

³ GLASSCOCK, R. S., and others. BEEF YIELD AND QUALITY FROM VARIOUS GRASSES. Fla. Agr. Expt. Sta. Rpt., p. 53. 1946.

grazed it down to the ground before taking any other plants. Such good forage plants as Paspalum, rye, orchard grass, Harding grass, alfalfa, white clover, Spanish clover, and birdsfoot trefoil were planted in this grass garden.

A demonstration plot installed by James Doi, assistant county agent on Maui, at Huelo clearly showed that pangola can compete favorably with Hilo grass, yellow foxtail, rice grass, and sedges. Some cattlemen have observed pangola crowding out such aggressive grasses as Kikuyu and Wainaku grass (*Panicum repens*). Ranchers' experience indicates that it is an easy matter to replace carpet grass with pangola in the pasture.

ESTABLISHMENT AND MAINTENANCE IN PASTURE

Pangola is a relatively easy grass to establish in a pasture. Seeds are very rarely produced, and all plantings are done with sprigs. Those who have planted pangola say that the runners make the best planting material. These runners can be easily developed in a seed garden by planting the sprigs about 6 feet apart between the rows. As the runners develop, harvest them and never let the runners close in tightly to form a mat. Upright mat-forming stems develop only when the runners become crowded. The application of phosphate at the time of planting is highly recommended. Several ranchers who have applied superphosphate at the rate of about 200 pounds per acre at the time of planting have had excellent initial growth. Subsequent applications of complete fertilizer have resulted in the greening of the grass and greater yield.

In planting the cuttings, a portion of the plant should protrude from the soil for best results. When the cuttings are planted too deep, some plant parts decay. A fair stand can be obtained by discing in $\frac{1}{2}$ to $\frac{3}{4}$ ton per acre of plants, stems, and runners. It is a good practice to firm the seedbed with a roller after planting, to bring the cuttings in close contact with the soil. The most important item in producing a good stand is favorable soil moisture. In planting, space the sprigs or cuttings about 3 feet apart in the rows and about 4 feet apart between the rows for best stands (fig. 5). Fred Conant and George Vierra have found that good land preparation pays. On many pasture lands, because of rockiness or steepness, the best that can be done is to dig a hole with a pick or a hoe and plant the sprigs. In some sections, as in Kona, thick stands of big guava shrubs are bark-treated with herbicide to defoliate them. When the shrubs are defoliated, pangola is spot-planted in shallow holes. Half a handful of superphosphate placed in each hole has given remarkable results.

LEGUME MIXTURE

Studies in Florida show that birdsfoot trefoil grows nicely in mixture with pangola grass.⁵ A few patches of pangola-birdsfoot trefoil mixture trials installed in Kona, Hawaii, by county agent John Iwane indicate that a good mixture can be established.

Another legume that does well with pangola in Hawaii is intortum (*Desmodium intortum*). This is a trailing tropical legume that belongs to the Spanish clover group. In the Parker Ranch Paauhau pangola pasture, intortum was planted by Joe Pacheco, and an excellent mixture resulted. The stock grazed the plants, and 3 months after the animals had been removed the intortum had fully recovered for regrazing.

The trailing Kona and Ulupalakua strains of Spanish clover show some promising signs of growing nicely in a mixture with pangola.

⁵ WALLACE, A. T., AND G. B. KILLINGER. BIG TREFOIL — A NEW PASTURE LEGUME FOR FLORIDA. Fla. Agr. Expt. Sta. Cir. S-49, p. 2. 1952.



Figure 4. A thick matting of pangola grass.

Figure 5. Planting pangola at Princeville Plantation Ranch on Kauai. Note the phosphate fertilizer placed in the bottom of the rows.



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