

Factsheet:

Pasture Establishment in the U.S. Virgin Islands

by Elide Valencia,
Research Assistant Professor of Agronomy, UVI
and Gerard D'Souza,
Professor of Agriculture and Resources Economics, WVU



A publication of the University of the Virgin Islands Agricultural Experiment Station January, 2002

INTRODUCTION

Establishment of a high-quality, uniform stand of pasture in a short period of time is important to the success of a livestock operation. Failure to obtain a good stand means not only the loss of investment but also of the use of the land for a year or even longer.

If initially a sparse stand develops, most grasses have the ability to fill in the bare spots and eventually cover the ground, especially if the new planting is on virgin land. However, this still means a loss of time and use, and usually more problems with weeds. If a sparse stand of the new grass develops when planted on an old pasture contaminated with an aggressive weedy grass, such as hurricane grass (*Boithrocloa pertusa*), the ability of the new improved grass to provide complete ground cover decreases.

The primary purpose of this factsheet is to describe some of the planting methods used in the Caribbean. However, several requirements must be met in order to successfully establish a pasture. These will be discussed only briefly.

CHOOSING AN ADAPTED FORAGE

Many different grasses, legumes, and combinations are used for pastures in the Caribbean. The producer must choose



Panicum maximum Jacq. cv. Mombasa is adapted to mildly alkaline soils.

those adapted to the soil and climatic conditions at his/her location. Choosing the wrong pasture plants for a particular site can be very costly. A producer usually selects a base perennial pasture grass first, and then adds legumes (to fix nitrogen) to improve pasture quality.

LAND PREPARATION

A producer may want to develop an improved pasture on native, or undeveloped land, or he/

she may have an old pasture that needs to be renovated by planting a new improved grass. Several types of machines and methods are available to clear and prepare undeveloped land for planting of pastures. These can range from very large and expensive tree-clearing equipment (e.g., bulldozers) to ploughing with tractors and disk harrows used for final seed-bed preparation.

If the land is to be used only for grazing, some stumps and roots

can be left in place. However, this makes cultural practices, such as fertilizing and spraying, difficult. If the producer plans to harvest hay or silage, or plant the land in a row crop, then all stumps and roots must be removed.

To establish a new pasture grass on a degraded pasture land, it should be plowed and disked. A row, cash crop can be grown for one or more seasons. This will help to completely eliminate the old grass and other weedy grasses that may be present. A cover crop (i.e., lab-lab or mucuna) can also be used. In some situations, complete kill of the old grass with a herbicide such as Roundup® (glyphosate) may be required. If an annual crop or herbicide is not used, the land should be repeatedly disked during the dry season.

Final seedbed preparation is very critical, especially when planting small seeded grasses and legumes. The seedbed should be level, smooth, firm, and free of trash and weeds. One final disking just ahead of planting may be needed to eliminate any recently germinated weeds.

LIMING AND FERTILIZATION

In the Virgin Islands, most of the soils are moderately alkaline, and do not require liming. Fertilization practices can vary according to soil type. On the heavy clay-based soils, establishment fertilizer is usually applied just prior to planting or applied in split applications. A complete fertilizer 12-5-12 is recommended for pasture establishment in the Virgin Islands, at a rate of 50 lb/acre.

PLANTING TIME

Soil moisture is usually the most critical factor in determining



Fertilizing shredded Mombasa pasture.

when to plant and whether establishment will be successful. Always plant in a moist seedbed. Also plant at the time of year when good soil moisture can be expected to continue for several weeks (10 to 12 wks). In the Virgin Islands, grasses and legumes should be planted at the beginning of and during the rainy season (September to December).

Use good-quality seed (50-80% germination). The seed should also have enough energy for the seedling to reach the soil surface and grow rapidly. When vegetative planting material is used, it should have been well fertilized and should be mature when harvested for planting.

PLANTING METHODS Seed-propagated Forages

Throughout the years, several methods and types of machines have been developed to plant the seed of different forage crops. These range from hand-broadcast

equipment to the use of sophisticated precision planters. Grass seed is often mixed with fertilizer and broadcast on to the soil surface by a fertilizer-spreader. This reduces the number of trips over the field but may risk loss of fertilizer to leaching rains or allow fast-growing weeds to use the fertilizer before the slower growing forage crop. After broadcasting the seed, the soil is harrowed very lightly to appropriately cover the seed 1 cm (1/4 inch). Then a cultipacker or roller is used to pack and firm soil around the seed. In some situations, only cultipacking is needed to obtain sufficient coverage.

The seeds of some grasses (e.g., rhodegrass and guineagrass) are very small and should only be pressed into the soil surface. Any disking will likely cover the seed too deep. Also, Callide rhodesgrass seed is very light and fluffy. It has a tendency to bridge in the seed hopper and stop flowing through. To prevent this, it is often mixed



Weaned goats on a well-established Mombasa pasture.

with fertilizer. It has also been successfully planted with broadcast seeders that have a special agitator or auger that keeps the seed moving.

Many brands of broadcast seeders are available. Most of these spread the seed by means of a rotating spinner or fan. One type of broadcast seeder uses an oscillating arm (slinger). Some are powered by a hand crank and others by a small electric motor or by a tractor's power take off (PTO).

Several types and brands of precision planters are available for planting forage crops. The conventional grain drill with a seedbox attachment can be used for planting small-seeded grasses and legumes. For this type of planting, the grass drill has been modified by placing rolling coulters in front of each planting unit. This machine is often called a pasture drill or a sod drill, and it is used in some areas to overseed legumes into established pastures.

A cultipacker-type seeder, used on clean-tilled seedbeds, is popular, especially for planting expensive seed on a small acreage. This planter consists of two corrugated rollers pulled in tandem with a seedbox mounted between the rollers. The first roller makes shallow furrows; the seed drop into the furrows and they are covered by the second roller. This planter should only be used on land that is completely free of tree roots, rocks or other obstructions.

All of the precision planters can be calibrated to plant a definite amount of seed per unit of land area. A precise seeding depth can be obtained with these planters in contrast to broadcasting. Because of the precise seed depth, lower seeding rates can be used with these seeders as compared to broadcasting. In the Virgin Islands, a billion seeder has been used successfully. Also a hydro-seeder is available for use.

Vegetatively-propagated Forages

Hybrid bermudagrasses (i.e., Tifton-85), Mott-grass, stargrasses and pangolagrass are planted using sprigs or tops (cuttings or stolons). Matured material is cut, covered and transported on a truck or trailer to the site where it is to be planted. If more than a day is used between cutting and planting, the producer must be concerned about the planting material overheating. The material can be soaked with water to cool it, or it can be unloaded and spread out in a thinner pile to allow the heat to escape.

When planting material is harvested, it should be free of weedy grasses, well fertilized and relatively mature (10 to 12 wk old). Depending on the type of planting equipment available, the planting material can be harvested and handled loose, formed into small rectangular bales (50 lbs) by a conventional hay baler, or formed into large round bales (1,000 to 1,500 lbs). The baled material must be planted as quickly as possible (same day) so that it does not overheat.

Vegetative propagated grasses should be planted at the rate of 1,200 lb (new land) to 1,800 lb (old land) of planting material per acre. Even higher rates can be used if the planting material is nearby, abundant and inexpensive. Producers are encouraged to first establish a nursery of a new grass from which they can expand their planting. This practice provides the producer with less expensive planting material, and since it is on site, there is less time spent between harvesting the planting material and actual planting.

The land on which the nursery is established should be prepared in such a way that it is free of all weedy grasses before planting the

new grass. If a weedy grass is present in the nursery, it will be spread along with the new improved grass, thus contaminating all of the new pastures.

The planting material can be broadcast on the soil surface by hand or with the help of machines. A "grass planter" has been used for many years in Florida and elsewhere. This machine uses a spinner or fan mechanism to throw and scatter the planting material. It is pulled behind a flatbed truck or trailer that is loaded with the planting material usually in 50-lb rectangular bales. A tractor and four helpers are needed to distribute the planting material. One moves bales to the back of the trailer, two lift bales onto the planter and cut the strings (bindings), and two — one on either side of the planter — feed or drop pieces of the bales on to the spinner.

Once the planting material is on the ground, it immediately should be covered or pressed into the soil. For this purpose, a disk harrow with the blades set fairly straight can be used, or a fairway-type roller that has the flanges with blunt edges can be used to push the planting material into the soil. This tool works well on moist sand.

The soil should then be firmed around the planting material by pulling a cultipacker or heavy land roller over the land at least twice to

create an extra firm seedbed. The land rollers are usually filled with water to give them added weight.

A pre-emergent herbicide can be applied the same day as planting. Some producers use 2,4-D (2 lb/acre), a common phenoxy herbicide, as a pre-emergent herbicide. A post-emergent application of herbicide can be applied 3 to 4 weeks after planting to control any broadleaf weeds that develop. Certain postemerge herbicides such as Banvel®, or a combination (Weedmaster®) can be used on most but not all grasses.

One must know whether or not these herbicides will injure the new grass before using them. For example, 2,4-D cannot be used on any seedling grass such as bahiagrass or limpograss. On the other hand, Banvel can be used on limpograss, and, in South Florida, producers can use Weedmaster when establishing stargrass and bermudagrasses.

If herbicides are not available, mechanical control by mowing at appropriate times will provide control of annual weeds or at least prevent them from crowding out the new pasture grass.

ESTABLISHMENT COSTS

Cost of establishment depends on several factors, including location, land preparation and cultural practices. Labor and machinery will likely account for the greatest

proportion of establishment cost. If a permanent, perimeter fence does not exist, this will add to the establishment cost as well.

For example, in the VI, establishment cost for 20 acres could total approximately \$14,000, including site preparation, seed, fertilizer, fencing, watering troughs and pipes, labor and machinery.

Since establishment costs are only incurred once, but the benefits are distributed over time, such costs need to be annualized (a simple way to annualize equipment costs, for example, is to divide equipment cost by the years of useful life).

SUMMARY

For a successful pasture establishment you must plan ahead:

- Have the land prepared during the dry season.
- Prepare a smooth, level, weed-free and firm seedbed.
- Be prepared to plant during the time of year when rainfall is well distributed.
- Use quality seed or matured planting materials.
- Always plant into a seedbed with good soil moisture.
- When planting, place the seed or planting material at the appropriate depth.
- Firm soil around the seed and use appropriate establishment fertilizer and weed control.

Prepared by Elide Valencia, Assistant Professor of Agronomy, University of the Virgin Islands, and Gerard D'Souza, Professor of Agriculture and Resources Economics, West Virginia University. Issued by the University of the Virgin Islands Agricultural Experiment Station, James Rakocy, Director.

University of the Virgin Islands
Agricultural Experiment Station,
P.O. Box 10 000,
Kinghill, VI 00850
Telephone: (340) 692-4020
Fax: (340) 692-4035

http://rps.uvi.edu/AES/aes_home.html

Funding for this Factsheet was provided by a grant from the Sustainable Agriculture Research and Education (SARE) LS 99-107.