

centers, building contractors, homeowners, and golf course/athletic field superintendents. Growers with small acreage and/or limited tractor-trailer shipping capabilities generally sell to homeowners and lawn care professionals. Markets outside Florida currently consist of Alabama and Georgia. Establishing a market before planting and ensuring repeat business by providing a quality product is essential for most businesses. Advertising generally ranges from yellow pages, trade magazines and/or newspaper ads, to booths at various trade shows, by word-of-mouth, and direct business contacts with garden centers, landscape contractors, and others.

Shipping costs generally limit the competitive range for most producers. Delivery charges are typically determined per load, per loaded mile, or per square yard (1). The weight of sod grown on mineral soils is about 5 pounds per square foot. Sod grown on muck soil is generally less expensive to produce and lighter in weight; therefore, it can be transported over longer distances still at a competitive price.

Delivery means for growers will differ. For large producers, usually an 18-wheel, tractor-trailer rig is preferred. Many job sites do not have unloading facilities; therefore, rear-mounted portable forklifts are brought along with the sod. Smaller producers or smaller loads will best be served by appropriately-sized trucks.

Sod pallets used normally are 48 inches square and are built from inexpensive lumber. Locating and maintaining adequate pallets can be a problem for the manager.

### Costs and Return

Costs and returns vary considerably with location, equipment, and labor available, and with management practices. Generally, prices for sod increase as the farm size decreases. Data from 1988 Floratam St. Augustinegrass sod production lists capital costs of approximately \$1,800 per acre, exclusive of land investment. Production costs would be about \$650 per acre. Net profit per acre, including interest and principal payments on capital expenditures, is approximately \$350 per acre. Capital investments for sod farms include land, buildings, and equipment. Variable costs include labor, fuel, fertilizer, pesticides, repairs, and parts. Fixed costs include insurance, taxes, depreciation, land charge, management charges, and others (1). Labor for a 250-acre sod farm is estimated at five full-time and two part-time (seasonal) employees. Secretarial and/or record-

keeping must also be considered. Machinery estimated for a medium-sized, 100-to-250-acre farm is listed in Table 6. Other costs include computers, phones, rakes, shovels, shop/office equipment, pallets, and others.

Table 6. Typical machinery inventory for a 100 to 250 acre sod farm (modified from 1).

Chisel plow	Trucks (2) 22 ft. w/trailers
Disk-12 ft.	(1) 1½ ton (1) pickup
Rotovater-8 ft.	(x) flat beds for shipping
Roller-8 ft.	Sod harvester-16 to 18 inch tractor mounted
Sprayer-400 gal.	Forklift and pallets
Fertilizer spreader-1000 lb.	Irrigation with pump (2) center pivot or traveling gun
Reel mowers-3 to 9 gang	Building—shop, office, telephones, computer
Sweeper-5 ft.	Cultipacker-12 ft.
Tractors with turf tires (2) 40 to 45 hp (2) 80 to 85 hp (1) 130 hp	Rotary mower-16 ft.
	Flail mower-16 ft.

### Laying

Proper soil preparation and turf maintenance procedures must be followed to ensure the survival and desirable aesthetics of sod. In central and north Florida it is generally best to lay sod in spring and summer. Year-round installation is possible in south Florida if fall and winter temperatures remain conducive for turf growth. The following steps are suggested for laying sod:

- 1) Soil test to determine nutrient deficiencies.
- 2) Apply recommended nutrients, especially phosphorous and potassium, plus other soil amendments and incorporate these by tilling 6 to 8 inches deep.
- 3) Allow soil to settle by irrigating or rolling. Rake or harrow the site to establish a smooth and level final grade. The finish grade should be about one inch below walks and drives.
- 4) Prior to sodding, *irrigate* the soil to cool the surface and provide initial moisture to roots. *If this is not performed, the sod roots will be subjected to initial heat and water stress damage resulting in lower sod survival.*
- 5) When laying the sod, the first strip should be laid along a straight edge. For better knitting,