Ground Cover Production on Plastic Mulch©

Ross Elsberry
BT&R Elsberry Inc, P.O Box 3172 Apollo Beach, Florida 33572 U.S.A.

Hugh Gramling
Tampa Bay Wholesale Growers Association, 1311 S. Parsons Ave., Seffner, Florida 33584-4573 U.S.A.

INTRODUCTION

Sometimes you run across a good idea and just have to take advantage of it. That is what we have done to get a very efficient system to rapidly produce groundcover plants in the Florida climate. During the 1950s, the University of Florida developed a system at its Bradenton Gulf Coast Research Center to grow vegetables in Florida's sandy soils. This system concentrates fertilizer, holds moisture, and minimizes weed growth, plus it allows the grower to mechanize many functions. It is known as the plastic mulch system.

The soils in central Florida often are sandy and devoid of organic matter. In fact, when people see our soils, they want to know how we grow a crop in "that stuff." With that in mind, producers grow in an environment that mimics hydroponics. All the nutritional elements are added at some time during the process.

LAND PREPARATION

The system involves growing in a plastic-covered, banked row. To use this system there are certain land requirements. The land has to be leveled. You can have a slope, but the land can't have dips or hills. This is necessary to allow the water to flow freely without accumulating in the low-volume irrigation system. Also, it is helpful to have a shallow hard pan to hold the water level high in the soil profile.

As you know, Florida is flat — really flat. You can see for miles, but still it is necessary to level the land. On unprepared land, we use a laser level to set a slope of 2.5 cm (1 inch) drop every 30.5 m (100 ft). The laser system also fills holes and scrapes down rises. When the land has previously been used for crops, we use a device called a level board to smooth out the soil and fill any holes. The level board is pulled behind a tractor and consists of several blades set at angles to move the soil back and forth as it smooths.

Next, we plow water ditches about 5.5 m (18 ft) on center. The ditches are flooded to allow the water to seep laterally across the field and bring the moisture level up to a sufficient level. After hydrating the soil, a bed press gathers soil and forms a raised bed 15 cm (6 inches) high and 71 cm (28 inches) wide. During the same process, a bead of fertilizer is laid down the middle of the bed.

The next step is to fumigate the bed with methyl bromide, lay drip tape on top of the bed near the fertilizer strip, and then cover the bed with 2-mil plastic sheeting. A specialized piece of equipment does all of these functions in one process.

An additional device punches holes in the plastic and forms a cavity to receive a plant or bib. This process is done 10 days to 2 weeks after the methyl bromide is injected. This time gives the gas a chance to sterilize the soil before it dissipates.

PLANTING AND PROPAGATION BY DIVISION

All the plant material we grow in this system multiplies by division. We split and trim bib material and prepare bulbs by treating them with fungicides. The bibs and bulbs are then stacked in trays for planting.

Planting is done by a crew inserting the stock into the pre-punched holes (Fig. 1). Mechanical planting of bib type crops does not give the necessary precision needed to minimize plant losses. An experienced crew of six can plant 1 acre in a day — that's about 86,000 plants. The plants are watered immediately after planting to insure soil is packed around the root system.

CROP PRODUCTION

All that is required after planting is time and irrigation management. Irrigation is done on a regular schedule to maintain the water in the bed column (Fig. 2). If the moisture level falls, flooding or irrigation with the low-volume system is difficult to bring the moisture level back to a point where optimal growth is possible. Sometimes it is impossible.

Since most of the growing area is covered by plastic, there is not much weed control necessary. Generally, all required is to mow the middles or spray them with Roundup®. The plastic lasts for a year under Florida conditions. Care must be given to not tear the plastic. Once the plastic is damaged, splitting accelerates rapidly, and weeds will become a problem.

HARVESTING THE CROP

At the end of the year, the plastic is pulled off. The plants are either harvested or left for additional growth. The plant's canopy usually covers the bed area by the time the plastic is removed, which minimizes weed growth. Weeds that do grow are mowed, treated with Roundup® or ignored.

One of the key components of making this system work is the ability to mechanically harvest the material (Fig. 3, 4). Again, we have adapted farm equipment to save a tremendous amount of labor. Using this equipment, we can harvest 183 m (600 ft) rows in about 10 min. This involves digging the plants, removing the soil and extraneous plant material, and loading the plants in baskets for further processing. The bib material is taken to a processing facility where it is washed, trimmed, separated, and packed in bundles of 25 plants.

The bulb material is mowed to remove the tops, dug mechanically and, then taken to a field facility where the soil is washed away from the bulbs. The bulbs then are taken to a mechanical grading system where they are separated by size and stored in climate-controlled rooms until shipment.

Some of the plants grown in this system are *Hemerocallis, Tulbaghia, Liriope, Caladium, Alocasia,* and *Colocasia.* The bulb plants are harvested in the fall and shipped in the spring. The herbaceous plants are harvested and shipped throughout the year.

By adapting a proven system for vegetable production, we have made reproduction of ground cover plant material for the nursery industry an efficient, affordable production technique on a mass scale.

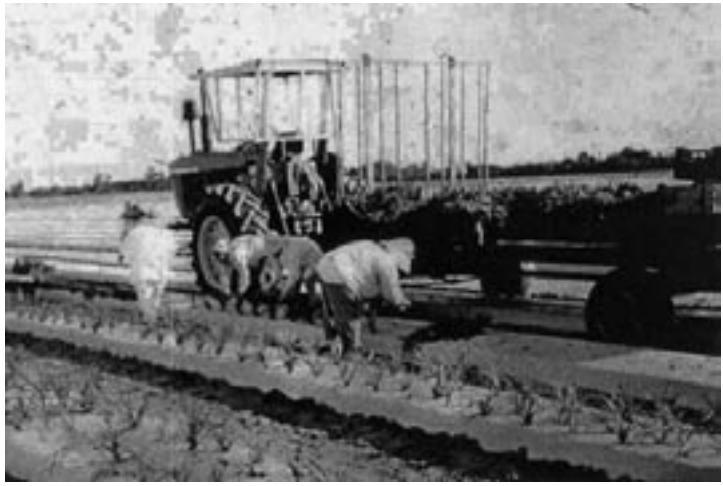

Figure 1: Plants are watered with drip tape buried in the plastic covered beds.

Figure 2: Planting of daylily and liriope is done by hand.

Figure 3: Plants are harvested.

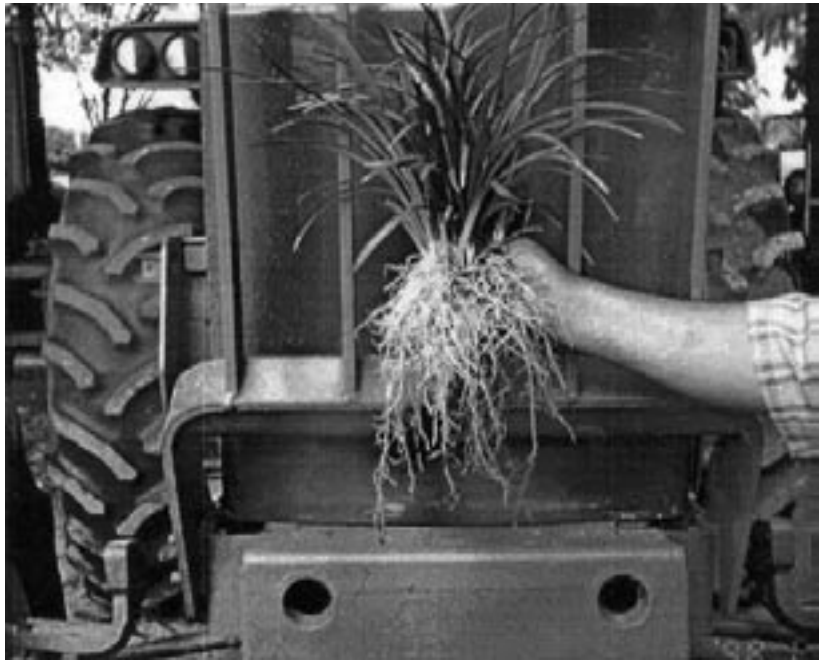

Figure 4: A mechanically-dug clump of *Liriope gigantean*.