Under the din of "zsssst...plunk..whoosh," the mechanical tomato transplanter lumbers along the rich loam of a Homestead field.

As one arm of the green metal machine sears a hole in the plastic ground roll, a chute drops a seedling, then a spout sprays water, over and over.

The machine makes short work of the planting, while field workers -- some shrouded in floppy hats or scarves -- feed seedlings into the cylinders or walk behind it to straighten tilted plants. Sixteen people toiled under the sun last week, handling a workload that once took scores of laborers.

"It's more efficient," says Jim Husk, who manages the farm operations at DiMare Florida in Homestead. "We are going to plant 20 acres today."

In three months, if the weather, the bugs and the market cooperate, the tomatoes will be ready to ship.

The consolidation of farming into big operations like DiMare's is one of the modern aspects of Homestead agriculture as farmers dig in against woes ranging from global competition and imported pests to hurricanes and soaring land prices. To stay competitive, the industry is making investments to upgrade technology and machinery to cut costs.

But Miami-Dade County -- which generates an estimated $1.1 billion a year from agriculture and as of the 2002 census still had 90,000 acres of farmland -- is also seeing a proliferation of small farms and nurseries, as farmers try niche strategies to survive.

Some have branched out to assembly-line production of former exotics, like orchids and bromeliads; others are exploring niche markets, like fruit wines, or conducting plant research as a sideline.

The result is a Homestead that the farmers of the 1950s -- or even the 1980s -- would hardly recognize.

Today Homestead farmers no longer grow limes (squeezed out by disease) or potatoes (buried by advances in storage). They follow the demise of long-ago farming: cattle, dairy farms and poultry production, underscoring the dynamic changes that characterize agriculture.

Row crops and citrus groves are giving way to tropical fruit orchards and tree nurseries. Instead of fresh vegetables destined for Publix, more growers are raising ornamental plants bound for Home Depot.

"There are two trends," says Katie Edwards, executive director of the Dade County Farm Bureau. "We are seeing an increase in the number of [small] farms. We are seeing an increase in very large farms and cooperatives."

Middle-size farms, she adds, "are either going out of business or going to consolidate."

For much of the 20th century, Homestead, with the most freeze-protected farmland in the 48 states during winter, distinguished itself as the winter breadbasket.

But free trade -- particularly the 1994 North American Free Trade Agreement with Mexico -- opened the U.S. borders to cheaper produce from other countries year-round. And that's only one of many problems farmers face.
RECURRING DISASTERS

"I don't think there have been three years in a row that we haven't been hit by something, whether it be a freeze, a flood, a hurricane, a drought or chemical problems," said Bobby Lee, president of Superior Foliage.

And there is the specter of importing pest and disease. The Port of Miami-Dade and Miami International Airport receive thousands of containers and packages from foreign countries -- with the risk of potential pests and diseases also coming on shore.

Foreign growers and importers are pressing the United States to lift a ban on importing plants set in soil. The ban exists because of the threat that dirt could carry new pests and diseases.

"It's a recipe for disaster, because all these pests are being introduced directly to Miami where it is a tropical climate," said Erik Tietig, vice president of Pine Island Nursery, which grows fruit trees. "We bear the burden of all the diseases coming from overseas."

Hurricane Katrina, which belted South Florida Aug. 25 on its way to greater destruction on the Gulf Coast, was the latest -- and for some the last -- blow. Damage totaled more than $427 million for growers, with nurseries bearing the brunt of the misery.

On Friday, Rep. Mario Diaz-Balart announced he and other South Florida lawmakers had introduced hurricane relief legislation for nurseries and tropical fruit producers, similar to disaster programs in the past.

In the days after Katrina struck, Sally Stribling, president of Miami-Agra Starts, stared at her destroyed shade houses, which left plants exposed to damage from a scorching sun. Retailers don't buy plants with damaged foliage; consumers want perfect houseplants.

THE LAST STRAW

Miami-Agra Starts had already been wiped out in 1992 by Hurricane Andrew, Stribling said. The enormous destruction from Hurricane Katrina was the last straw.

"It's just too risky," she said. "Wiped out once, wiped out twice, wiped out the third time -- we are just not going there."

Within weeks of the hurricane, Stribling and her brother Jim, who is her business partner, sold one 20-acre nursery to a new owner, who plans to continue growing their trademarked Ficus of the Future plants.

Instead of growing potted plants, which cannot be insured, Miami-Agra Starts will market its patented ficus plants and license growers to use the varieties in return for royalties, she said.

"This is a prime example of niche marketing," Stribling said. "The dynamics of the market are changing. We can't keep raising beans as our grandpappy did."

DIVERSIFYING

Robbie Bishop, owner of 27 Farms, lost most of his avocado crop in the hurricane. As with other avocado growers, he found what wasn't blown off was heavily damaged.

Still, things could have been worse for Bishop, a lifelong farmer, if he hadn't diversified. Besides planting row crops, like beans, squash and eggplant, he also does plant research that now accounts for nearly 50 percent of his revenue.

Midwestern companies and universities developing new lines of corn and soybeans rely on Bishop's farm to plant new generations of seeds during the winter months, giving them an additional season each year to advance genetic changes in a process that can take up to a decade.
NEW WINES

Peter B. Schnebly has taken another tack. He is hoping that his Schnebly Redland's Winery in the Redlands, now bottling tropical fruit wines, will add to the bottom line of his existing operations of Fresh King Farms, which has 96 acres of tropical fruits, and Fresh King Packing.

The winery provides a bonus for fruit growers: a chance to sell No. 2 fruit that isn't good enough to sell in supermarkets but perfect for fermenting.

"It could mean that people could be planting fruit trees here instead of tearing them out," said Monica Mejia, Schnebly's stepdaughter who runs the wine operations.

 Probably the biggest change that began after Hurricane Andrew is expansion and then explosion of nurseries.

Like many in Homestead, John Alger, a traditional third-generation Homestead farmer who expects a son and possibly a daughter to follow him in the business, jumped into a new crop line to hedge his bets.

Instead of sticking with row crops, he began growing landscaping trees -- from palms to mahogany and oak - - on family land near the Everglades.

Although he still plants sweet corn, last year marked his and Homestead's final crop of potatoes. New technology that extends potato storage for up to 12 months means no one will pay a premium price for Homestead potatoes in the winter, he says.

TIME WILL TELL

Whether the Homestead farmers' sundry strategies will prove to be successful with the changing times remains to be seen.

State agriculture experts say agriculture has always been dynamic and Homestead will continue to adapt to the changes.

"We can't paint with a broad brush and say all of agriculture may be gone," said Donald W. Pybas, county extension director for the University of Florida' IFAS Extension. "We may not have large tracks of row crops."

One big change for Homestead farmers is the South Florida real-estate boom. Few farmers can afford to buy land at $100,000 an acre, while the cost of leasing land is also rising.

And the entire industry is facing huge hikes in the cost of fuel, fertilizer, insurance and tax payments.

Even large growers and packers, such as DiMare, say they face huge pressures.

"Agriculture in this country is in trouble all the way across the board," said Tony DiMare, president of the DiMare Co., the largest grower of fresh-market tomatoes in the United States.

DiMare, who works now at DiMare Ruskin just south of Tampa, says "The tomato industry still is viable" around Homestead. But the scion of the agribusiness family is less sanguine about the outlook for small, niche market players.

"It's a short-term fix," he said. "It is in a sense desperate people looking for diversification trying to stay alive."