



TOMATO AND PEPPER PRODUCTION: Unique Challenges for Florida Growers

Unique Challenges for Florida Growers

- **Weather Events**
- **Poor Soils**
- **Pest & Disease Pressure**
- **Labor**
- **Development & Urban sprawl**
- **Regulations**



Figure 1. Florida is also the lightning capital of the world. Lightning can blast crops leaving circular patterns and poses a formidable risk to field workers. Photograph by: Thomas Wright.



Figure 2. Hurricane Wilma damage and flooding. Photograph by: Monica Ozores-Hampton.

“The fact that Florida is the number one producer of fresh market pepper and tomato in the United States is quite remarkable given the unique challenges to growing vegetables in Florida and is a testimony to the resourcefulness and skill of the growers engaged in producing these crops.”

WEATHER EVENTS:

While Florida’s normally mild semitropical climate may seem ideal for the cultivation of warm season crops like peppers and tomatoes, producers have to deal with wide variations in temperature ranging from blazing hot to freezing cold. High temperatures can inhibit pollination and fruit set while all parts of extreme southern peninsular Florida can experience an occasional frost and more rarely a devastating freeze that can inflict millions of dollars in crop loss in a few short hours.

Florida receives bountiful precipitation however, the majority of the annual rainfall (50 to 70 inches in the major production areas) occurs during the wet season, which typically extends from May–June through mid October. During the long dry season, which coincides with the major part of the production cycle, it is not uncommon to go weeks and sometimes longer without a drop of rain. Given this reality it is impossible to successfully produce vegetables without irrigation.

Throughout the dry winter months, weather fronts passing across the state can result in uncharacteristic heavy rainfall as cold dry Arctic air collides with moist tropical air masses. Tropical storms can drop as much as 5 – 10 inches (or more) of rainfall in a few hours or days (**Figure 2**). Thus, growers may spend nearly as much time and money pumping water off their fields as they do irrigating their crops.

This environment necessitates that growers provide for exquisite drainage by planting on raised beds and maintaining elaborate canal systems to remove excess water from the land. Intense rains can also result in leaching of fertilizer depriving crops of needed nutrients as well as resulting in non-point source pollution of ground water in some instances.

During the winter months, much of peninsular Florida can be blanketed by dense protracted fogs and heavy night dews resulting from the interaction of cooler terrestrial air and warmer air masses moving in from the surrounding waters. These events can occur on a nearly daily basis for extended period of time in some seasons and may endure until 9 or 10 AM before eventually dissipating. These events cause ideal conditions for the development of disease, which can be difficult to control until environmental conditions ameliorate.

Florida’s geographical location makes it extremely vulnerable to direct hits from tropical weather systems and hurricanes originating in the Atlantic and/or Gulf of Mexico. Looking at a map of hurricane strikes over the last 100 years it becomes readily apparent that no area of the state has been spared and most areas suffer a direct hit every couple of decades. These violent events can leave plantings in a shambles resulting enormous losses in a brief period of time (**Figure 2**).

“Climate is what you expect, weather is what you get...”

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POOR SOILS:

Most of the soils used to produce peppers and tomatoes in Florida are some sort of sand ranging from coarse “ball bearing” sands to fine “sugar” sands. In other pepper and tomato producing regions, most notably in the Homestead area, what passes for soil is basically pulverized limestone from ancient coral reefs. In either case, Florida’s soil is merely a media to hold plants that provides little in terms of nutrients beyond what the grower supplies.

LOW ORGANIC MATTER CONTENT:

As a result of the high average temperature and high annual rainfall, the organic matter (OM) content of many agricultural soils is extremely low, often a fraction of a percent at best. Due to both low OM and the porous nature of these sands, Florida’s soils have very low water holding and cation exchange capacity. Some soils can literally go from a flood to drought condition in less than two weeks if rain does not occur or irrigation is not provided.

POOR FERTILITY:

Low native fertility and low cation exchange capacity dictate that growers use high rates of fertilizer to supply all the essential nutrients that their crops require to produce. This situation makes leaching, especially under high rainfall or poor irrigation management, a distinct possibility, a factor that can contribute to non point source nutrient loading of surface water adversely affecting environmental sensitive areas nearby. In some instances on some of Florida’s uncoated sands the exchange capacity is so low is that there is nothing to bind minerals to what are basically miniature glass beads that even some nutrients such as phosphorus that are typically considered to be immobile elements become mobile moving with ground water.

pH PROBLEMS:

The pH of Florida soils can vary widely as well ranging from very acid as low as 4.2 on native Pine Flatwoods fine sands to quite alkaline as high as 7.8 – 8 on the Rockdale soils and marls of Miami-Dade. Since much of the irrigation water used in agriculture is extracted from the limestone underlying the state, the pH of many originally acid soils can increase dramatically over time moving from an acidic to an alkaline condition in response to sustained irrigation, which can add as the equivalent of a ton of lime per acre on a yearly basis. These extremes of pH can induce either nutrient toxicity at the lower end of the pH scale or nutrient deficiencies as pH increases above 7 that a successful grower must learn to anticipate, diagnose and rectify.

PEST AND DISEASE PRESSURE:

Given the state’s humid subtropical environment and warm average annual temperatures, insect, weed and disease pressure is constant and can be intense at times. Unlike other more temperate pepper and tomato producing areas, most of the state’s growing regions do not experience hard freezes that so effectively reduce pest pressure.

Pest control costs for Florida growers surpass those encountered in many other growing regions of the United States.

Per acre production costs for pepper and tomato in Florida often exceed \$10,000 per acre in large part due to the high cost of pest control.

EXOTIC AND INVASIVE SPECIES:

Florida’s environment is also favorable for the introduction, survival and establishment of exotic pests entering the state from other countries. It is estimated that at least one new introduced pest or disease enters the state each year.

In 1997, *Tomato yellow leaf curl virus* infected whiteflies blew into the state by hurricane winds most likely from the Dominican Republic (**Figure 3**).

In 2005, chilli thrips were detected in the state and since have been found in a least 16 counties across Florida. This pest has the potential to become a major pest of peppers and other vegetables and ornamental plants.



Figure 3. A tomato plant infected with *Tomato yellow leaf curl virus*, left, stands next to disease-resistant plant developed by UF/IFAS. Once infected with the disease, tomato plants no longer grow normally, and no longer produce marketable fruit. Photograph by: Ernest Hiebert.

Prepared by: Gene McAvoy



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Surveys of vegetable producers in southwest Florida indicate that growers spend from 6% to over 30% of their time and energy trying to comply with and maintain documentation required by various regulations.

LABOR:

Successful tomato and pepper production depends on an adequate supply of labor to plant, nurture, harvest and pack the crop. Florida's vegetable industry is heavily reliant on migrant labor. Unfortunately many of these laborers enter the US illegally and have attracted the attention and ire of many citizens and legislators who seek to curb the flow of undocumented labor into the country.

Competition for labor from the construction, fast food, hotel, landscape and others industries could negatively impact the supply of labor and force wage increases.

DEVELOPMENT AND URBAN SPRAWL:

Rapid development has gobbled up much of the prime agricultural land previously used for tomato and pepper production in eastern Palm Beach, Homestead and more recently in southwest and west central Florida.

Development has also raised real estate prices to levels, which prohibit the purchase of land for agricultural use in most areas of the state. In some areas land sells for in excess of \$100,000 per acre and it is almost impossible to find any land for less than \$15-20,000 an acre suited for crop production any where in south Florida (**Figure 4**).

As housing encroaches on agricultural areas, neighbors may object to pesticide spraying, the movement of heavy equipment on roadways and other operations associated with agriculture.



Figure 4. Rapid development and increasing land values throughout Florida are prohibitive for agricultural development.

Photograph by: Jeff HansPetersen.

REGULATORY ISSUES:

Successfully negotiating the regulatory environment can be a daunting task. The acronyms for the rules and the names of the agencies that administer them present a veritable alphabet soup for the typical grower.

BMP:	Best Management Practices
FWC:	Florida Fish and Wildlife Conservation Committee
FDACS:	Florida Dept. of Agriculture and Consumer Services
FDEP:	Florida Department of Environmental Protection
EPA:	US Environmental Protection Agency
SWFWMD:	Southwest Florida Water Management District
WPS:	Worker Protection Standard

Layered on top of legislative regulations may be buyer-mandated programs such as food safety or fair wage programs that have begun to emerge in recent years.

Competition from offshore producers has also emerged as a factor affecting vegetable producers in Florida. Besides the lower cost of land and labor, many of the areas currently in competition with Florida's growers are not bound by the regulatory tangle that vegetable producers in Florida must negotiate.

In response to many of the factors discussed above pepper and tomato production in Florida is now primarily controlled by a relatively small number of large corporate agribusinesses that have the ability to spread risk between multiple production centers and the resources to endure the adversity of a poor market year or years.

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