

## Site Selection - Florida Greenhouse Vegetable Production Handbook, Vol 2<sup>1</sup>

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Careful planning prior to construction is an essential first step in the development of a successful, profitable greenhouse production system. Before anything else, the site of the operation must be chosen. Ideally, many sites should be objectively evaluated for their suitability to the proposed project. However, the property being considered for the greenhouse may already be owned by the potential investor. Under these circumstances, the investor should be especially careful to fairly appraise the site.

### Regulations and Services

The first consideration is whether the site satisfies local regulations and has access to required services. The proposed site must meet local zoning requirements and the intended greenhouse operation must meet local construction, water, and environmental permitting requirements. In addition, the availability and cost of installing utilities must be considered. If electrical service or municipal water is already available, the need for an upgrade in service

must be evaluated. Access to good roads should also be considered. Transportation requirements to the greenhouse site relate directly to the intended operation's size and marketing arrangements.

Taxes vary depending on whether a site is inside city limits or in the county. Taxes also vary considerably from one district to the next. Finally, the intentions of local government and regulatory agencies with regard to agricultural exemptions, annexation, and growth plans should be considered in terms of the business plan.

### Water Availability and Quality

High quality water is an essential part of any type of greenhouse production. Water obtained from a shallow or surface source may carry nematodes, pathogenic bacteria, fungi, algae, or weed seeds into the greenhouse system. This is especially true if the water is drawn from ponds or streams that drain agricultural land. Shallow wells should not pose a problem, but if a well's casing is cracked or improperly installed it will be more prone to

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contamination from surface water problems than a deep well.

Although water is usually obtained from deep wells, generally municipal systems can also supply water of adequate quality for hydroponic greenhouse production. However, before becoming totally dependent on city water, the economic costs should be considered. Regardless of the water source, samples should be tested for suitability by a local Extension agent. A complete water analysis is critical and should include at least: pH, electrical conductivity, bicarbonates, iron, sulfur, calcium, and magnesium.

### Physical Site Requirements

A north greenhouse orientation is recommended in Florida, with the headhouse located on the north end. The site should not be shaded by trees or other structures either on the same or adjacent property. The initial dimensions of the site should be specified with these two criteria in mind.

The greenhouse site and adjacent areas should be relatively level (Fig. 1).



**Figure 1.** Possible site for a greenhouse.

Level sites allow the construction of large greenhouses that are more economical to heat and cool on an area basis than small greenhouses. Large greenhouses on level sites are also easier to automate than small greenhouses. Starting with a nearly level site reduces the amount of earthwork required to provide a level building site. A level site also eliminates workers having to climb slopes carrying or pushing heavy loads.

The site should have some elevation and be well drained to avoid flooding during heavy rainstorms. After preparation, areas adjacent to the greenhouse site should have at least a 2% slope away from the house site to promote the runoff of rainwater. If the site is located in a poorly drained area, then drainage ditches or underground tiles can be used to provide drainage.

Growers should avoid areas that contain much clay, especially shrink/swell clays. In addition to the drainage problems that clay soils can create, shrinking and swelling clays can cause cracks in concrete floors and foundations. Areas that contain soil pushed over large objects such as tree stumps should be avoided due to differential settling of soil beneath the house. Sites near waste oil, chemical storage, or dump sites should be avoided.

Adjacent land use is another consideration in site selection. Nearness to active commercial field production of vegetables will increase local pathogen inoculum levels (especially airborne inoculum) and local populations of damaging insects. Nearby abandoned commercial fields, dumps, and agricultural spoil piles pose the same risk for greater disease and insect incidence in greenhouse production.

### Forward Planning

As suggested above, the future intentions of the local government and business community should be taken into account during site selection. For example, future environmental restrictions will most likely require safe disposal of discharge water to avoid contamination of lakes, streams, or groundwater. So, plans should be made for the construction of facilities to handle discharge water effectively, especially for hydroponic systems. This could include an overland spray system or drain percolation field.

In Florida, especially near urban areas and interstate highways, future land development should be considered for its impact on the operation's business plan. Residential or commercial construction in the area near the site can have a significant effect on services, zoning, taxes, and land values. Depending on the long term intentions of the investor, these trends can be beneficial or detrimental.

For long term investors, the physical site should be large enough to allow for possible future expansion. Potential adjacent areas for expansion should be clear of any shading throughout the growing season. Placement of power service poles and power lines should be carefully considered to avoid conflicts with possible future expansion. Natural windbreaks could be a benefit if not too close to the house to cause shading or serve as a source of insect or disease problems.

### More Information

For more information on greenhouse crop production, please visit our website at <http://nfrec.ifas.ufl.edu/sv-research/>.

For the other chapters in the Greenhouse Vegetable Production Handbook, see the documents listed below:

#### Florida Greenhouse Vegetable Production Handbook, Vol 1

Introduction, HS 766  
 Financial Considerations, HS767  
 Pre-Construction Considerations, HS768  
 Crop Production, HS769  
 Considerations for Managing Greenhouse Pests, HS770  
 Harvest and Handling Considerations, HS771  
 Marketing Considerations, HS772  
 Summary, HS773

#### Florida Greenhouse Vegetable Production Handbook, Vol 2

General Considerations, HS774  
 Site Selection, HS775  
 Physical Greenhouse Design Considerations, HS776  
 Production Systems, HS777

Greenhouse Environmental Design Considerations, HS778

Environmental Controls, HS779

Materials Handling, HS780

Other Design Information Resources, HS781

#### Florida Greenhouse Vegetable Production Handbook, Vol 3

Preface, HS783

General Aspects of Plant Growth, HS784

Production Systems, HS785

Irrigation of Greenhouse Vegetables, HS786

Fertilizer Management for Greenhouse Vegetables, HS787

Production of Greenhouse Tomatoes, HS788

Generalized Sequence of Operations for Tomato Culture, HS789

Greenhouse Cucumber Production, HS790

Alternative Greenhouse Crops, HS791

Operational Considerations for Harvest, HS792

Enterprise Budget and Cash Flow for Greenhouse Tomato Production, HS793

Vegetable Disease Recognition and Control, HS797

Vegetable Insect Identification and Control, HS798