

Virtual Grower

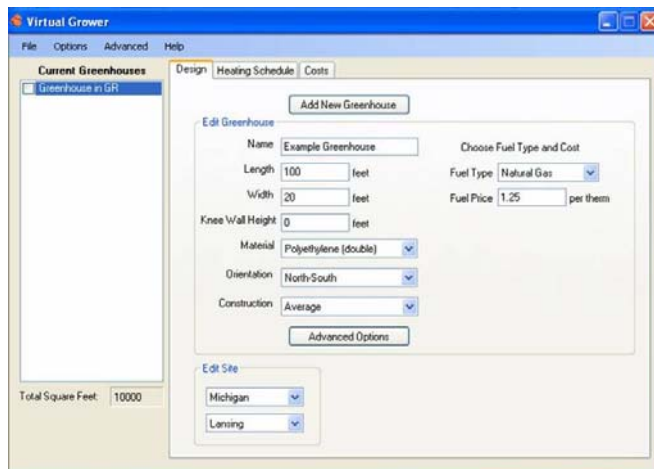


Virtual Grower is a decision support tool for greenhouse growers. Users can build a greenhouse with a variety of materials for roofs and sidewalls, design the greenhouse style, schedule temperature set points throughout the year, and predict heating costs for over 230 sites within the US. Different heating and scheduling scenarios can be predicted with few inputs.

This computer software program was developed by Jonathan Franz and colleagues at the United States Department of Agriculture (USDA-ARS) in Toledo, Ohio. The program can be downloaded free at:

www.ars.usda.gov/services/software/download.htm?softwareid=108

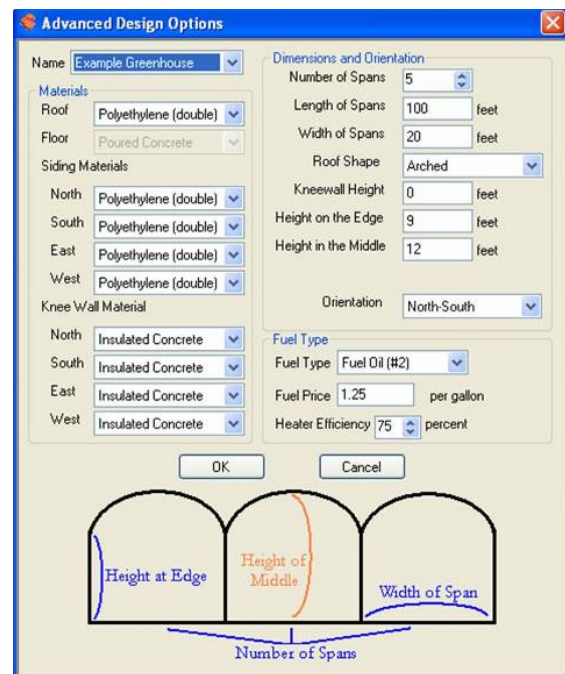
Below are two examples of input screens. Once your greenhouse characteristics are entered, along with temperature setpoints and dates, the estimated energy costs are provided.



The screenshot shows the 'Virtual Grower' application window. The 'Edit Greenhouse' form is active, displaying the following fields and values:

- Name: Example Greenhouse
- Length: 100 feet
- Width: 20 feet
- Knee Wall Height: 0 feet
- Material: Polyethylene (double)
- Orientation: North-South
- Construction: Average
- Fuel Type: Natural Gas
- Fuel Price: 1.25 per therm

Buttons for 'Add New Greenhouse' and 'Advanced Options' are visible. A 'Total Square Feet' field shows 10000. The 'Edit Site' section shows 'Michigan' and 'Lansing' selected.



The screenshot shows the 'Advanced Design Options' dialog box. The 'Example Greenhouse' is selected. The 'Dimensions and Orientation' section includes:

- Number of Spans: 5
- Length of Spans: 100 feet
- Width of Spans: 20 feet
- Roof Shape: Arched
- Kneewall Height: 0 feet
- Height on the Edge: 9 feet
- Height in the Middle: 12 feet
- Orientation: North-South

The 'Materials' section includes:

- Roof: Polyethylene (double)
- Floor: Poured Concrete
- Siding Materials: North, South, East, West: Polyethylene (double)
- Knee Wall Material: North, South, East, West: Insulated Concrete
- Fuel Type: Fuel Oil (#2)
- Fuel Price: 1.25 per gallon
- Heater Efficiency: 75 percent

Buttons for 'OK' and 'Cancel' are at the bottom. A diagram below the dialog shows a cross-section of a greenhouse with labels: 'Height at Edge', 'Height of Middle', 'Width of Span', and 'Number of Spans'.

This tool can be used to provide support for grower decisions as to the cost of heating different greenhouses at different temperatures at different times of the year. With this tool, and your knowledge of plant responses to temperature, you're on your way to produce crops in the most energy-efficient manner.