UNIVERSITY OF FLORIDA
Florida Cooperative Extension Service

Fact Sheet EES-85
October 1992

Energy for Florida Tomatoes[1]

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Energy Facts

Florida Tomatoes

56,000 acres, 2.3% of the cropped land.
Statewide, uses 5.61 trillion Btu of energy,
4.6% of all energy used in Florida agriculture.
Per 25-pound carton, uses 79,400 Btu of energy.
$78 return per million Btu of energy used.

Tomatoes were grown on about 56,000 acres in Florida in 1990 and rank sixth among all Florida agricultural commodities in direct energy requirements and seventh in total primary energy requirements. More energy is consumed for tomato production in Florida than for any other vegetable crop. Tomatoes require 4.3% of the direct and 4.6% of the total primary energy required for all Florida production agriculture. Statewide, tomato production accounts for 1.67 trillion Btu of direct energy and 5.61 trillion Btu of total primary energy.

The amount of direct energy for tomato production in FAECM is 30.0 million Btu/acre and the total primary energy is 104 million Btu/acre. This is 22,800 Btu (equivalent to 0.16 gallons of diesel fuel) of direct energy per 25-pound carton of tomatoes produced and 79,400 Btu (equivalent to 0.57 gallons of diesel fuel) of total primary energy per carton. The major energy inputs for tomato production are "other costs" (29%), diesel fuel (24%), labor (14%), pesticides other than herbicides, insecticides and fungicides (8%), and nitrogen (6%). "Other costs" includes such inputs as transplants, depreciable capital costs, and stakes (Figure 1, Table 2).

Comparison of the value of tomato production with its energy requirements shows that the value per million direct Btu of $263 is almost twice the average for all Florida agriculture production of $136. The value per million total primary Btu of $78 is also far above the state's average of $44. The consumer is purchasing less energy per dollar when purchasing tomatoes than when purchasing the average complement of Florida agricultural products.

1. This document is Fact Sheet EES-85, a series of the Florida Energy Extension Service, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication date: October 1992.

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The Florida Energy Extension Service receives funding from the Florida Energy Office, Department of Community Affairs and is operated by the University of Florida's Institute of Food and Agricultural Sciences through the Cooperative Extension Service. The information contained herein is the product of the Florida Energy Extension Service and does not necessarily reflect the views of the Florida Energy Office.

FLORIDA AGRICULTURE PRODUCTION ENERGY

The data presented in this fact sheet were developed using the Florida Agricultural Energy Consumption Model (FAECM), a computer model. FAECM uses acres of production or livestock numbers and the energy used to make the production inputs required per acre or per head to quantify the *primary* energy used in Florida for agricultural production. This *primary* energy consumption includes fuels, lubricants and electricity, called *direct* energy inputs, as well as the energy used in providing all production inputs (*indirect* energy inputs).

It takes energy to drill an oil well, pump the crude oil out, refine it and transport the diesel fuel to the grower. It takes the energy in the natural gas feedstock plus the energy used to construct the production plant, power the production plant and drive the truck to get the nitrogen fertilizer to the grower. FAECM quantifies the eight direct energy sources (diesel fuel, LP gas, etc.), the indirect energy used to make those eight energy sources available and the indirect energy used to provide thirteen major agricultural inputs (nitrogen fertilizer, pesticides, etc) to determine the energy required to produce agricultural commodities in Florida.

In total, FAECM is a model that predicts all the energy required to provide all inputs necessary, up to the farm gate, for all of Florida's agricultural production, FAECM does not address energy requirements for any transportation, packing, processing, distribution or other functions provided for agricultural commodities after they leave the farm gate.

FAECM shows that direct energy inputs for Florida agricultural production have remained relatively constant since 1974 (Figure 1). Variations are due mainly to changes in commodity production levels and a changing mix of commodities produced. The reduction in total primary energy is due primarily to increases in energy efficiency of industrial production systems for agricultural production inputs.

Florida consumed 66% more energy in 1990 than in 1974, due in large measure to its increased human population. Florida agricultural production energy, expressed as a percentage of the rapidly increasing Florida total energy consumption, has decreased sharply from 7.8% in 1974 to 3.9% in 1990.

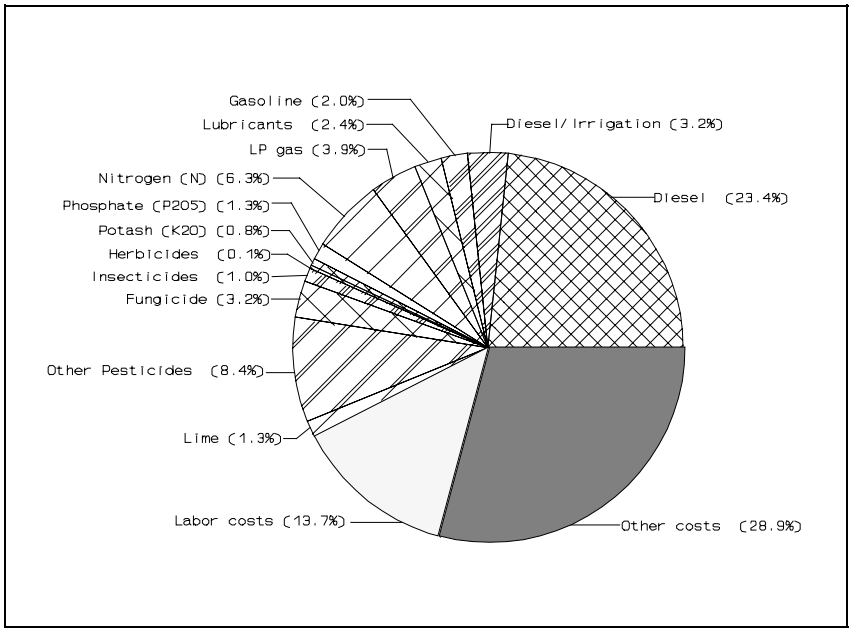

Figure 1. Primary energy inputs for Florida tomato production.

Table 2. Primary energy inputs for Florida tomato production.

Energy Inputs	%
Other costs	28.9
Diesel for non-irrigation	23.4
Labor	13.7
Other pesticides	8.4
Nitrogen	6.3
LP Gas	3.9
Fungicides	3.2
Diesel for irrigation	3.2
Lubricants	2.4
Gasoline	2.0
Phosphorous	1.3
Lime	1.3
Insecticides	1.0
Potash	0.8
Herbicides	0.2