ENERGY COSTS AND BUDGETS

TOK FURUTA

Cooperative Extension
University of California
Riverside, California 92507

Picture John and Jane in their living room. Theirs is a comfortable home in an upper middle class neighborhood, Suburbia, USA. This evening, just before the cold winter, they are again in serious discussion about their future. Fuel for heating the house in the winter, and electricity for cooling the house in the summer is becoming more limited and that which is available is more costly. They had been asked to conserve on the amount of water they used during the past summer to keep their yard healthy and inviting. The price of gasoline has increased and they are facing prospects that gasoline is not always available. Inflation is taking its toll.

John and Jane have been through a lot together. Now they have built a lifestyle that is comfortable, exciting and pleasing — they are not about to give it up easily. They have built some wealth, and they do not want their wealth in paper to be eroded by inflation. How can they maintain their lifestyle, maintain their financial position and live with inflation and fuel shortages.

Among the options open to them are the reduction of purchases of plants and other items they bought with the dollars allotted for discretionary purchases. Yet they know that they can reduce the amount of energy needed to cool or heat their house by the proper placement and use of plants (1).

Now that they are alone, they might move into a townhouse — a smaller, tighter house would be less costly to heat and cool. The yard is maintained by the homeowner's association so that their gardening will be limited to the patio using special planting systems designed especially for these situations.

John and Jane must also consider the new state law that simply states that every person occupying a building has a right to sunlight from 10 a.m. to 2 p.m., and that if they permit a tree or shrub to shade more than a small percentage of the solar collectors during these hours they will be guilty of maintaining a public nuisance and subject to fines for every day the nuisance persists. They know they can calculate the maximum height the plant can attain in their yard before it begins to shade the solar collector on their neighbor's house to the south (2).

John and Jane will not make major decisions tonight. However, their discussion begins to point out courses of action open to them. When they do make a decision, many industries could

be affected as they change their purchasing patterns and habits.

Now, let us turn to Joe and Jose. They have just reviewed the amount of fuel they used the past year for production of crops and they are trying to plot their course for the future. They are planning under the conditions that the amount of energy — fuel, gasoline, electricity, etc. will be limited, perhaps even to a maximum amount available, and that which they use will be definitely more costly. They have decided that the strategy they adopt must support the position that the available energy be stretched as much as possible and at the same time costs must be controlled as much as is feasible.

Joe and Jose know that, to cope with the energy situation in the future, they must anticipate how the general economy will go, how John and Jane will react in terms of purchasing plants, and how the energy situation will develop. Then, and only then, can they plan their course of action, using the anticipated or predicted events as mileposts for their planning.

Several courses of action, alone or in combination, seem to be feasible to our nursery managers. They realize that all decisions cannot be made simply on a cost-effectiveness basis alone because at times it may be necessary to use a more costly solution simply to stay in business. While going out of business is a course of action open to them, they definitely do not want to take it. They do know that they must take this course before they are forced into it, however, if they want to maximize the returns they take out of the business. Forced into bankruptcy by rising costs and income not keeping up is not for them.

Our nursery managers may decide on a combination of courses consisting of conservation, alternative production procedures that are less costly in terms of energy, and the use of alternative sources of energy. Future plans call for alternative products to meet the changing needs of the consumer. Also, branch operations in areas of the country or world where energy requirements are not as severe is a definite possibility.

In the short run, conservation is the only way to cope with the situation. They must depend on the same sources of energy — gas, oil, etc. Alternative sources — solar, wind, etc. — are for long run considerations. They will use all the procedures of insulation, reducing infiltration of cold air into greenhouses by plugging all leaks, and efficient use of fertilizers and other materials that require large amounts of energy to produce.

The long run solution requires the examination of business location from the viewpoint of energy needs for production and for marketing, as well as the additional land, labor and capital needs. It does not make sense to locate in an area where energy for production is less if the savings are more than used for in-

creased energy needed to market the plants. The only justification, and a poor one at that, is that the type of energy needed for production is not available at any cost, and the type of energy needed for marketing is available.

Energy requirements to manufacture plastics.

Nylon	3700 to 3900 BTU per cubic inch
PVC	1800 BTU per cubic inch
Polyethylene (low density)	1100 BTU per cubic inch
Polyethylene (high density)	1400 BTU per cubic inch

Some ways to "insulate" greenhouses.

1. Double layer of plastic sheeting, inflate.
2. Plastic over glass or fiberglass, inflate.
3. Attach plastic insulation material to glass.
4. Thermal blankets over crops.
5. On north walls, attach styrofoam on glass.

Some ways to seal openings, reduce infiltration of cold air into greenhouses.

1. Double doors with weatherstripping.
2. Air "bags" over vents, fan openings, etc.
3. Lapseal between panes of glass or sheets of fiberglass.
4. Louvers that shut tightly.
5. Heater vents have means of controlling drafts.

Energy requirements to manufacture fertilizers.

1 ton of nitrogen requires 511,280,000 BTU of natural gas.
1 ton of phosphorus requires 4,390,000 BTU of natural gas.

LITERATURE CITED

(1) Several articles and books cover this subject. A general insight can be gained from these publications.
   a. Furuta, T. 1978. Properly Placed Plants Can Reduce Energy Use. Cox Publishing Co., Arcadia, CA 91006.
   b. Nelson, W.R. 1979. Landscaping Beautifies Buildings and Conserves Energy. American Nurseryman, Sept. 1, 1979.
   c. Robinette, G.O. 1972. Plants/People/and Environmental Quality. U.S. Dept. of Interior.

(2) Thayer, R.L. Jr. 1979. Landscape Planting for Energy Conservation. Presented at SMUD Seminar "Energy Efficient Neighborhood Design," Sacramento, California, February 24, 1979.

ETIOLATION AND ROOT FORMATION

JOHN A. DELARGY

Department of Pomology, University of California, Davis, California 95616

Abstract: A review of literature pertaining to the promotory influence of etiolation on root formation in shoot cuttings is presented. Characteristic features of this phenomenon are discussed in relation to both the action of light on growth and development and to the possible role of growth substances. The interaction of ringbarking (girdling) treatment with localized etiolation of the stem, in relation to root production, was investigated and a summary of the experimental results is given.

REVIEW OF LITERATURE

The inhibitory effect of light on rooting of shoot cuttings has