SOME BASIC GUIDELINES ON WAYS TO CONSERVE ENERGY

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With the cost of fossil fuel constantly rising, money saving energy conservation methods are a primary concern for greenhouse growers in colder regions. The greenhouse industry is based on energy consumption, as is most of the agricultural production in this country, and just a few years back oil prices were a quarter of what they are today.

Realizing this, what can the industry do? It has been forecasted that conventional greenhouse structures will not be feasible in 20-30 years but, instead, new growth facilities including underground or warehouse type structures utilizing artificial lighting may be the wave of the future. For the present it will be necessary to work with existing structures or to build new structures that make better use of developing technology. This should be reinforced with efficient management so that producers can survive to meet the long term changes.

Here are some ways to conserve energy and some ideas which will provide new approaches to solving problems in the greenhouse industry.

Plant Production

Plan the growing schedule to include low temperature crops during winter months, where feasible, to fit your over-all sales program. This field should open up a new area for plant selection and breeding.

Foliage plant producers in northern areas should grow only those plants that cannot be produced more efficiently in other areas. For example, we cannot compete with Florida producers who can grow a four foot Scheflerra or Ficus in 4-5 months (Conover, 1976). Grow only plants that cannot be purchased at competitive prices. Growers in New England should produce their foliage in the warm months of the year, May-September, when it isn't necessary to pay the oil man for heat.

Greenhouse Modifications

Double cover plastic houses using air inflated polyethylene. A single layer may be installed over fiberglass, using a larger inflation fan. Over glass, 2 layers of plastic are usually necessary. This will result in a measurable loss of light, even though the glass is cleaned, which must be balanced against heat saving.

Install a thermal barrier below the roof which is retracted during the day. Windbreaks to protect the greenhouse may be used to further reduce heat loss. Clean the glass to increase light and also utilize heat trapped by the "greenhouse effect" in the winter. If shade is needed for any crop, use internal shading such as saran netting.

1. Reduce heat loss with weather stripping.
2. Use double entries and tight doors.
3. Insulate north greenhouse walls and cover with reflective foil.
4. Double glaze other ends and walls.
5. Place reflective foil behind all heating pipes located on walls.
6. Experiment with peninsular or movable benches to increase production area and improve efficiency.

Heating Systems

Modify the heating system so that heat is brought into the greenhouse on the ground level and not at the top of the greenhouse where some of it is lost. Alternate sources of energy include reclaimed oil, wood, etc.

Improve heating system efficiency by 1) checking stack temperatures, 2) using CO_2 analyzers to check stack concentration, 3) insulating mains, valves and feed-water tanks, and 4) maintaining traps.

In conclusion, some of the above practices mean that the greenhouse industry should change but others imply making better and more efficient use of what is already available. Sloppy methods must be replaced by better, more efficient ones. It is estimated by some experts that energy consumption in present greenhouses can be reduced by one-half with existing technology. The future may bring added reduction via alternate energy sources (i.e. solar energy) to reduce this even further.

Literature Cited

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