Anon. 1975. Worth paying for more efficient boiler equipment to save 30 percent. *The Grower* 83:1282.

As indicated in the table below, a survey of different types of greenhouse boilers showed that combustion efficiency varied by as much as 30 percent.

This sort of efficiency loss amounts to at least $6,900.00 per acre per year. This is justification for investing in more efficient equipment. The boiler's correct firing rate must be maintained by choosing the right jet size for the load. Over-firing during 'on' periods increases stack losses, and long 'off' periods also cause heat loss. Over-cooling during long 'off' periods can lead to increased smoking on refiring, and smoke deposits are highly detrimental. For every 1 millimeter thickness of soot deposit, fuel consumption can increase by 3 percent. Excessive air to fuel ratio is often a major source of heat loss. Too much air, indicated by low CO2 in the flue gas, leads to a high rate of heat waste up the stack. An 8 percent reduction in excess air can save 1 percent in fuel.

Some heating systems, notably free-blowing warm air and overhead steam pipes, only give the desired temperature at plant level when the temperature at eave or ridge is 5 to 10 degrees F higher. This involves excessive energy consumption. Ideally, radiant heating would heat the plants without bringing the surrounding air to the same temperature. There are two means of radiant heating: circulation of hot oil at 750 degrees C through heating pipes and internally gas fired steel pipes.

Typical efficiencies of boilers commonly used for glasshouse heating.

Boiler type	CO2(%)	Exhaust gas temperature (°F)	Typical combustion efficiency (%)
Lancashire (and similar)	9	650	74
Economic packaged (3 pass)	13	450	85
3 pass economic	11 1/2	500	82
2 pass scotch marine	11	550	79
Vertical, firetube type	10	700	75
Vertical, cross tube type	8	1000	58
Cast iron sectional	10	600	77