

## SAVE ENERGY WITH HORIZONTAL AIR FLOW

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Why should horizontal air flow (HAF) be considered as an energy saver? Does it conserve heat, reduce air infiltration or reduce electrical consumption? The answer to all three questions is "yes."

HAF effectively eliminates temperature stratification in greenhouses. The temperature a few inches from the ridge will be nearly the same temperature as it is a few inches from the floor.

When we first questioned the reduction in heat loss attributed to reducing the temperatures in the greenhouse peak, a counter loss was proposed. In a HAF system the air is moving past the glass or plastic at 40 to 100 feet per minute. This should increase heat loss. The reduction in heat loss due to elimination of stratification overshadows the expected loss due to air flow past the glass or plastic.

Infiltration causes a great deal of heat loss in glass houses. HAF appears to reduce infiltration loss as evidenced by a house being treated with a pesticide smoke losing the smoke more slowly. In tight plastic houses the loss due to infiltration is minimal and HAF will not reduce this energy loss. In such houses, air movement is more important for disease control and carbon dioxide distribution.

The most obvious energy saving is electricity. The low horsepower fans used in HAF require about half the power used by a fan blowing into a tube in the top of the house to stir up the air. HAF produces far better air movement.

So, to the advantages of HAF reported before:

1. Installation costs are only a fraction of that of other systems.
2. Little maintenance is required.
3. Both hot and cold spots are eliminated.
4. Humidity is reduced next to the leaves.
5. Moisture condensation on plants is reduced, aiding in disease control.
6. CO<sub>2</sub> utilization is improved since the leaves are "scrubbed" by the air.
7. No CO<sub>2</sub> distribution system is required.
8. Only 1/2 to 1/3 as much power is required.
9. Temperature stratification is practically nonexistent so heat loss in the greenhouse peak is reduced.

We can add:

10. Infiltration heat loss is reduced.