

Keep Fans Running Efficiently

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Most greenhouses today are equipped with ventilating fans. Their primary functions are to control high temperatures, remove excess humidity and to replenish the carbon dioxide used by the plants.

The ventilating fans in a greenhouse operate 2,000 to 4,000 hours each year depending on the crops grown and temperature setting on the thermostat. For a 36-inch diameter, 1/2-HP fan, for example, operating costs will be from \$100 to \$200 per year.

To ensure that you have an effective and efficient ventilation system in your greenhouse, the following points should be checked:

- The ventilation system is sized to provide one volume air change per minute to a height of eight feet for summer ventilation or 3/4 volume air change per minute for spring and fall operation. For example, for a 25' x 96' greenhouse the fans should have a capacity of $25' \times 96' \times 8' = 19,600$ cubic feet per minute (cfm) for summer use. This should be measured at 1/8-inch static water pressure to overcome friction losses in the louvers.
- Fans are located on the endwall or side of the greenhouse away from prevailing summer winds, if possible.
- Intake louvers are located on the endwall or side opposite the fan and have an area equal to 1-1/2 times the fan area. Inlet louvers are motorized to ensure positive operation.
- When purchasing new fans, select those that have been tested in accordance with AMCA (Air Moving and Control Association) standards. Use larger fans with smaller motors, for example, a 36" fan with 1/3-HP motor will give the same output as a 30" fan with 1/2-HP motor with a saving of \$4 per month in electricity cost. Both have 8,800 cfm output.

- When only one fan is needed in a greenhouse, it should have a two-speed motor to provide more flexibility of operation. A two-stage thermostat should be used for control.
- Doors located near the fans should remain closed when the fans are operating to prevent short circuiting of the air.
- Thermostats with a $\pm 1^{\circ}$ F differential should be located in the center of the growing area to sense temperature at plant height. Electronic thermostats are a good choice for this. Placing the thermostats or sensors in a box and aspirating with a 40-60 cfm squirrel cage blower or muffin fan will help to sense the temperature more accurately.
- Maintenance of the fans is done on a regular basis and includes cleaning blades and shutters, oiling bearings, removing weeds in front of shutters and adjusting fan belts.

