

Construct the pad so that all air entering the house will have to pass through the pad. Provide a method of closing off the pads during the winter when heating, not cooling, is required.

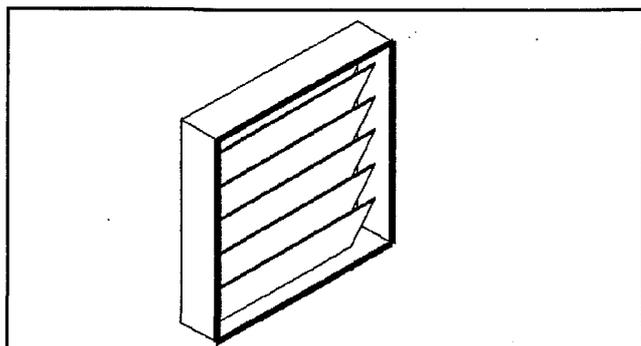


Figure 6. Ventilation and cooling fans should be equipped with anti-backdraft shutters.

Fans

Fans should have the capacity to provide at least one air change per minute. Heat enters the greenhouse through the greenhouse covering and causes the air temperature to rise. Solar heat loads on greenhouses will vary according to latitude location, as well as time of year and day. For example, in central Florida it will vary from a maximum direct normal solar irradiation in BTU per hour per sq. foot of about 280 in June to 300 in September (Table 1).

Table 1. Maximum direct normal solar irradiation.

Date	Maximum direct solar irradiation in BTUs per hour per square foot	
	24° N Latitude	32° N Latitude
June 21	280	280
July 21	279	278
August 21	285	283
September 21	301	296

Location of Fans and Cooling Pads

The best distance between the pads and exhaust fans is influenced by optimum dimensions of the house from an efficiency, functional and operational standpoint and the effective tolerance of plants produced in the house to temperature differences. The greater the crop's tolerance to temperature differences, the greater the distance between pad and fans can be. It is not practical to separate the pad

and exhaust fans by more than 200'. A distance of 150' or less is preferred.

Location of pads and fans will be influenced by several factors. Keep in mind:

- When possible, locate pads on the prevailing summer wind side and locate the fans on the downwind side of the greenhouse. Should the pads be protected by another house within 25', the wind effect is negligible and can be ignored.
- If it is necessary to face fans into the prevailing winds, increase fan CFM capacity 10 to 15% and correspondingly increase fan motor horse power and add shutters or back draft dampers.
- The exhaust fans should not discharge toward the pad of another house unless the houses are separated by at least 50'.
- When fans from two adjacent houses close to each other exhaust into a common area between the houses, they should be offset from each other to avoid the air from one blowing directly against the other (Figure 7). Roof mounted fans should be used if fans do not have at least 1.5 fan diameter clearance between their discharge opening and the nearest obstruction.
- The maximum practical distance from pad to fan should never exceed 200'. Distances of 150' or less are more effective to reduce the temperature gradient. For most houses, about one foot of pad height is required for every 20' of pad to fan distance.
- In very long houses, it is more efficient to locate a pad at each end with the exhaust fans at the center of the house using side wall or roof mounted fans. Cooled air then flows in from each end and is exhausted at the midpoint of the house. All fans should be equipped with automatic shutters for weather protection and to prevent backdrafts when fans are not in use.
- Special motorized roof housings are used for mounting fans on the roof.
- The fans should be properly screened and guarded to safeguard personnel from coming in contact with any moving parts (fan blades, pulleys and belts).
- A correctly designed pad system is essential to achieve maximum cooling performance. It must