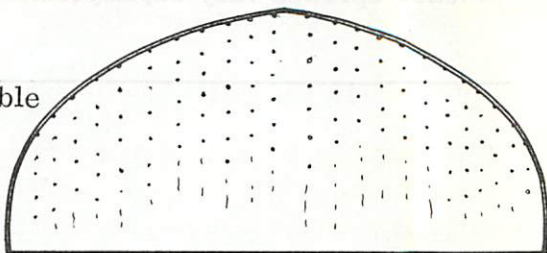


CONTROL GREENHOUSE DRIP

BY:

1. Exhausting humid air and replacing it with dry outside air.
2. Providing continuous air movement.
3. Applying double layer covering.
4. Using a wetting agent.



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Do you get a shower of rain every time you enter your greenhouse? Are you losing plants to fungus diseases? Then chances are that you are not keeping the proper moisture balance in the greenhouse. Water that is used for irrigation must leave the greenhouse. Most of this water that is either evaporated from the soil or is transpired by the plants should be removed by ventilation.

Most of the moisture problems occur during the late fall, winter or early spring when days are cloudy and cold. November is an especially troublesome month because daylength is near the minimum and clouds are at a maximum with an average of only 4 1/4 hours of sunshine a day in the New England area.

Condensation occurs when warm humid air inside the greenhouse comes in contact with a cold surface such as glass or plastic. The air that is in contact with this surface is cooled to the temperature of the surface. If this temperature is below the dewpoint temperature, then the water that is in the vapor state is transformed to the liquid state. For example, condensation occurs if greenhouse air at 60°F and 80% relative humidity (R.H.) comes in contact with a glass or plastic surface that is below 55°F.

There are several ways to correct this situation:

1. Reduce the humidity of the inside air. The temperature of the air greatly affects its capacity to hold water vapor. Air at 60°F will hold twice as much moisture as air at 40°F. In the range of temperatures encountered in a greenhouse, for every 20° rise in dry bulb temperature, the water-holding capacity of the air doubles and the relative humidity is reduced by one-half.

Applying this principle to our problem of reducing drip, we see that if we exhaust the humid air in the greenhouse and replace it with cool, dry outside air which when warmed in the greenhouse will absorb more moisture, we can lower the humidity. The cost of doing this for a 20'x100' greenhouse is about 1¢ per air exchange.

2. Air movement. Continuous air movement helps to reduce dripping because it reduces stratification of the air. Air that is moving is continually mixed resulting in very small temperature differences. The moisture does not get a chance to condense because the mixing action caused by the movement prevents the air along the surface from cooling to below the dewpoint.

When the greenhouse is heated with hot air furnaces, continuous air movement can be obtained by running the fans continuously. Some furnaces are equipped with a manual switch on the fan motor, others can be rewired by an electrician. If two furnaces are used, they should be set along opposite sidewalls near the endwalls. They should be set to direct the air in a circular pattern.

The fan-jet system can be used to move air within the greenhouse. In this system, the fan is connected to a perforated plastic tube located below the ridge of the greenhouse. The fan is set to run continuously and either draws in outside air through a louver or recirculates air within the greenhouse. The air in the tube is forced out through the small holes and mixes with the air in the structure. Air circulation with this system is not as efficient as moving the entire air mass.

Another system that gives good air circulation and mixing is horizontal air flow (HAF). This system consists of small fans placed along one side of the house to push the air in one horizontal direction and along the other side to push it back.

3. Double layer. Use of a double layer will reduce condensation in a greenhouse because an insulation effect is set up between the layers resulting in a warmer inner layer surface. The temperature of the inner surface is closer to the inside air temperature and condensation does not form as quickly. The double layer can be put on with one layer outside the frame and one inside or both outside separated by a spacer or air cushion. The distance between layers should be at least 1 1/2 inches to keep the plastic

films separated. It is desirable that the inner layer be as air-tight as possible to reduce condensation between layers.

4. Wetting agents. Wetting agents sprayed on the inside of the greenhouse covering reduce drip because the moisture instead of forming as droplets remains as a film. Greater efficiency is achieved if applied when the plastic is dry. If the roof is pitched steep enough (greater than 7 or 8 in 12), this moisture will flow along the surface to the eave or foundation.

Through the use of one or more of the above methods, drip can be reduced to a minimum.