

Humidity and Disease Control

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Condensation of moisture from the air is important in enabling penetration of the plant by certain fungi which require a water film for infection. Such condensation often determines the severity of such diseases as downy mildew of rose and Botrytis gray mold on flowers of chrysanthemum, carnation, and many other crops.

The amount of moisture that air will hold decreases as the temperature falls, until condensation finally occurs. In the chart, the top of each bar shows the maximum amount of moisture that air will hold at that temperature at the moment of condensation. Thus, air at 70°F. will hold almost twice as much moisture as it will at 50°; that is, half of the moisture will condense out of saturated air as the temperature falls from 70° to 50°F.

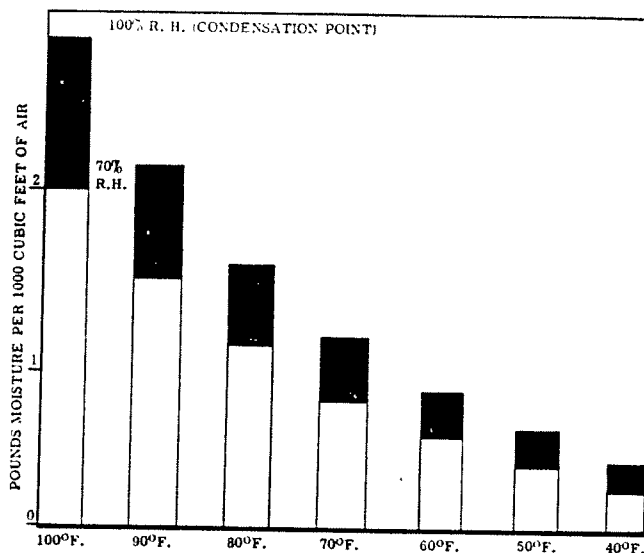
The more nearly the air is saturated with water vapor or the lower the temperature, the less the temperature may fall without producing condensation. The amount of moisture held by air at 70% relative humidity at each temperature is shown by the height of the white bar. The black areas show the moisture-absorbing capacity of air at 70% relative humidity in each case. They show that there is almost twice as great a margin of safety above the 70% level in air at 70°F. as at 50°. If the air in a green house was 70% relative humidity at 70°F and the night temperature drops to 50° condensation will have occurred. Actually, as shown in the table, condensation will occur at 59°F.

From data in the table, one can determine for air of a certain temperature and humidity how low the temperature can fall before condensation will begin. For example, in a greenhouse at 70°F and 80% relative humidity, condensation will occur with a 7 degree drop to 63°F.

To control Botrytis decay one should prevent condensation. It is necessary to keep humidity 10-20% below saturation to cushion against sudden temperature drops. This may be accomplished by proper balancing of heat and ventilation so as to keep the humid warm air moving out the top vents. If the large volume of air in the house is maintained at a moderate humidity, this will hold the air at the soil surface and near the plant below the condensation point. Keeping the plant parts dry is the best way to prevent the Botrytis gray mold.

Table No. 1

Existing Temperature °F.	Temperatures at which condensation will occur from air of indicated relative humidities.									
	----- Percent -----									
	100	90	80	70	60	50	40	30	20	10
100	100	96	92	88	83	77	70	61	49	
90	90	86	83	78	73	68	61	52	41	
80	80	77	73	69	64	59	52	44	33	
70	70	67	63	59	55	49	43	35		
60	60	57	53	50	45	40	34			
50	50	47	44	40	36					
40	40	37	34							



Amount of moisture held by air at different temperatures and humidities. Maximum capacity (100% or condensation point) is shown by height of black columns; moisture held at 70% relative humidity is shown by height of white columns. Moisture absorbing capacity of air at 70% humidity is shown by black areas.

Your editor,
W.D. Holley

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