

Overhead Sprinkler Frost Protection

Penn State Horticulture Research Farm





Specifications

Solid set system

Pond fed

Standard impact sprinklers 27/ac.

0.2"/hr application rate at 35 psi

5430 gal/acre per hour

Effective down to 23 degrees

Critical Information

Forecast

Minimum temperature

Wind speed

% Cloud cover

Dew point

Start time and duration of event

Bud stage and critical temperature

System start temperature

System shut off



System Start Air Temperature

Dew Point Temp	Wet-Bulb Temperature						
degree F	23.0	24.0	25.0	26.0	27.0	28.0	29.0
29.0							29.0
28.0						28.0	29.7
27.0					27.0	28.7	30.4
26.0				26.0	27.6	29.3	31.0
25.0			25.0	26.5	28.3	29.9	31.6
24.0		24.0	25.5	27.1	28.8	30.5	32.2
23.0	23.0	24.5	26.0	27.7	29.4	31.1	32.8
22.0	23.5	25.0	26.6	28.3	30.0	31.6	33.3
21.0	24.0	25.6	27.2	28.8	30.5	32.1	33.8
20.0	24.5	26.2	27.7	29.3	31.0	32.6	34.3
19.0	25.1	26.7	28.2	29.8	31.4	33.1	34.8
18.0	25.6	27.1	28.6	30.2	31.9	33.5	35.2
17.0	26.0	27.4	29.0	30.7	32.3	34.0	35.7
16.0	26.4	27.9	29.4	31.1	32.7	34.4	36.2
15.0	26.8	28.3	29.9	31.5	33.1	34.8	36.5
14.0	27.2	28.7	30.2	31.9	33.5	35.2	36.9
13.0	27.5	29.0	30.6	32.2	33.9	35.5	37.2
12.0	27.8	29.3	30.9	32.6	34.2	35.9	37.6
11.0	28.2	29.7	30.2	32.9	34.5	36.2	37.9
10.0	28.7	30.0	31.6	33.2	34.8	36.5	38.2
9.0	29.0	30.3	31.9	33.5	35.1	36.8	38.5

Ice Should Be Clear



Benefits

Low energy consumption

Relatively non polluting

Effective for radiation frost

May be effective for advection freeze

Can be used for irrigation



Disadvantages

High installation cost

Large volume of water required

Potential damage to tree structure

Potential to cause more damage