

Frost Protection Options for Strawberry Growers

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The last few years have seen strawberry growers irrigating through the night on multiple occasions to protect strawberry bloom. As we progress into the season it is time to review your options for frost protection before receiving that frost alert from your weather app.

Frost can kill strawberry flowers or injure them and cause misshapen berries. Critical temperatures for strawberries at different stages of development are found in figure 1.

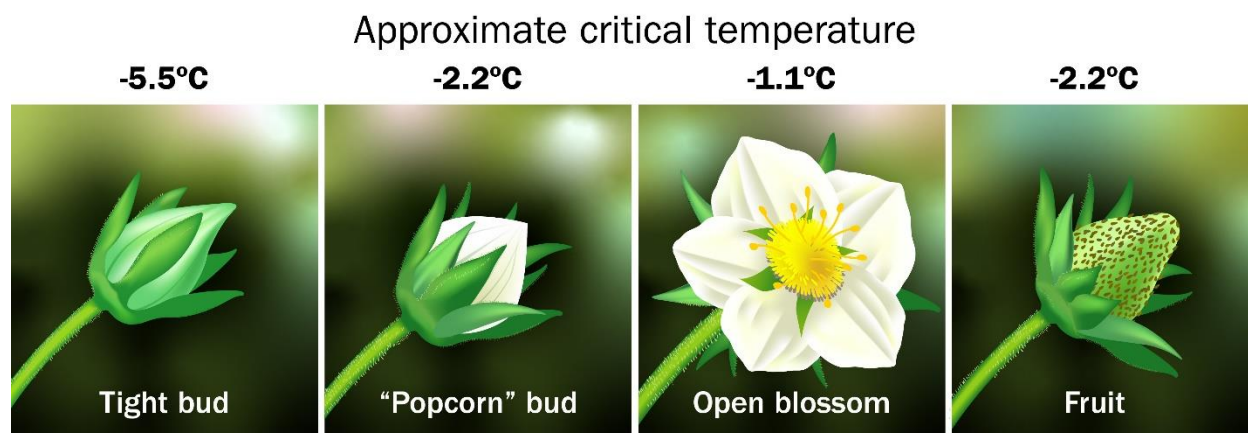


Fig. 1. Critical temperatures of strawberries based on stage of development (Source: Perry and Poling, 1985).

Growers can use irrigation or row covers to protect strawberries.

Irrigation will offer more frost protection than row covers alone. If you need to irrigate make sure you have enough water to irrigate for a couple nights in a row if necessary. Use the dew point to estimate how quickly the temperature might drop, and to determine when to start irrigating (table 1). If the air is dry, then the dew point will be low. If the dew point is below 0°C (32°F), frost forms instead of dew. The lower the dew point, the sooner you should start to irrigate.

Suggested starting temperatures for irrigation, based on dew point	
Dew point	Suggested starting air temperatures

-1.1°C	0°C
-1.7°C	0.5°C
-2.8°C	1.1°C
-3.8°C	1.6°C
-4.4°C	2.7°C
-5.5°C	3.3°C
-6.7°C	3.8°C
-8.3°C	4.4°C

Make sure the ice freezing on the plants is clear. If the ice is cloudy or milky white the application rate is not fast enough to protect the bloom. Irrigation can be stopped once the ice begins to melt, usually after sunrise.

If you don't have sprinklers for frost protection, irrigating (with drip tape or travelling gun) before the frost event will help if the soil is dry. Irrigate before the soil cools; the plants should be dry at night.

Row covers reduce evaporative cooling and the rate of cooling under the cover. Row covers offer 1-3°C of protection, depending on the weight of the cover and manufacturer, which could provide enough protection depending on the stage of your crop and the temperature. Row covers can also be used to buy time on a frosty night. Two 1- ounce row covers will offer more protection than one 2-ounce cover.

Row cover + irrigation

If using a combination of row covers and irrigation you will need to measure the temperature under the row cover. Begin irrigating right over the row cover once the temperature reaches 0.6°C- 1.1°C under the row cover, and stop when plant temperature starts to climb.



Check out the recently updated 'Irrigation for frost protection of strawberries' page at www.ontario.ca/page/irrigation-frost-protection-strawberries for more information on characteristics of different frost and freeze events, factors affecting the risk of frost, dew point, irrigation rates, and other important considerations for frost protection.

Keep an eye on the forecast this spring and remember that fields are often a couple degrees colder at ground level than the forecast.