

GROWERTALKS

Features

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Did You Kill 'Em?

Paul Pilon

For growers who overwinter perennials, they're entering the most challenging time of the year. Why's that, you ask? Most overwintering losses occur as the seasons transition from the cold winter to the warmer temperatures of spring. Before I explain this phenomenon further, here are a few factors affecting the survival of perennials during the coldest months of the year.

Inadequate or unhealthy root systems going into the winter is one reason many perennials often don't survive. The primary goal of overwintering is to ensure the survival of the root system. If plants are poorly established or have root health issues going into the winter, there's a greater chance of having survival issues following the cold season.

Inadequate moisture levels during the winter can also affect plant survival. Cold damage frequently occurs as high mortality rates in the outer rows of perennials that are grouped or blocked together inside structures. These plants are typically drier than those in the center of the block and are also subjected to colder temperatures due to their proximity to the outer wall. The reduced moisture content in the root zones lessens the buffering or insulative properties of the water in the growing mix and results in less protection from cold temperatures. When this occurs, cold damage and/or plant mortality often results.



Pictured: Large plant losses often occur in the outside rows when plants are blocked. These outside rows are usually drier and more susceptible to cold damage.

Variability in moisture from one container to the next also leads to inadequate protection from cold. The soil temperatures in dry containers will be significantly colder than pots with adequate moisture. This results in more potential for cold injury in the dry containers and often has no distinguishable pattern; some plants survive while others do not.

A high percentage of losses frequently occurs near the doors or at the ends of houses. These losses can be somewhat associated with moisture content as described above, but are usually the result of prolonged exposure to cold temperatures and

inadequate protection from cold.

Temperature fluctuations

The most common cause of overwintering losses is due to wide fluctuations in temperature during the late winter. As spring approaches and the outside temperatures warm up, the temperatures inside the structures will begin to fluctuate each day. It'll be significantly warmer inside the houses than the outside day temperatures. When this occurs, the perennials become de-acclimated or less tolerant of cold temperatures.

In many instances, there may even be some growth or activity occurring in the crown of the plants that's not even visible to passersby. Once the plants are de-acclimated and the growth processes have begun, they're no longer able to withstand freezing temperatures. Cold damage often results when below-freezing temperatures reoccur and the plants aren't properly protected.

This type of damage frequently occurs inside structures with no heat source and/or facilities that cannot be properly ventilated during the day. The injury and losses appear sporadic throughout the crop and have no defined patterns (the losses aren't just along the outsides of the blocks as described above). As the plants, de-acclimate and begin to emerge, they're most susceptible to cold injury. It's very important to provide protection from cold, either with coverings or providing minimal heat when the temperatures are below freezing at this stage.

During the late winter, keep the temperatures inside the structures as cool as possible. This will delay de-acclimation and keep the plants from growing too early. This takes a little effort, unless environmental controls can be utilized. For many growers, this entails opening and closing doors manually each day.

A good strategy during the late winter would be to keep the doors open any time the outside temperatures are above 30F (-1C). When the temperatures are expected to fall below 30F again, shut the doors again. Keeping the plants as cold as possible keeps them acclimated longer.

As spring approaches, the plants will de-acclimate, begin to grow and are much more susceptible to cold injury. The goal at this time is to keep the plants cool, but above freezing. Managing the doors is still a very important aspect of reducing temperatures and keeping the plants hardened. During this stage, the doors can be left open anytime the outside temperatures are expected to remain above 38F (3C). Decisions to open and close doors will need to be made each day.

Once growth is present, the plants will be susceptible to temperatures below freezing. Therefore, it will be necessary to apply the protective blankets or use minimum heat at this stage any time the temperatures are expected to be below freezing inside the structures.

Several growers utilize white poly to cover their overwintering structures to significantly decrease the temperature fluctuations in the spring.

Are they still alive?

Until growth resumes in the early spring, it can be difficult to determine if a perennial has survived the overwintering period.

Checking the root system is the first step to verify that a plant survived the winter. Ideally, the roots should be firm and have consistent coloration (lack of light and dark areas). Any variability in coloration could indicate that cold damage has occurred or the roots were under attack from pathogens prior to being overwintered. In most cases, root rots do not occur during the winter months since the temperatures are too cold for pathogen activity.

Don't just look at the roots though. It's more important to check the health of the crowns. Look for any new buds or stems developing near the soil line. If no growth can be seen, then gently dig below the surface and locate the crown of the plants. The crown should be firm, not soft or mushy. In most cases, cold damage has occurred when the crown is soft; these plants often don't survive.

If some root discoloration or crown damage is detected, consider applying a broad-spectrum fungicide drench that targets several plant pathogens, including *Fusarium*, *Phytophthora*, *Pythium* and *Rhizoctonia*. The fungicide application is most effective when the soil temperatures are 50F (10C) or warmer; this is when the pathogens will also be active. Applying fungicides when it's too cold for pathogen activity won't provide the amount of disease control as they do with warmer temperatures.

As you already know, there's great risk involved with overwintering perennials. By ensuring good health going into the winter, maintaining uniform moisture levels, decreasing temperature fluctuations and providing adequate cold protection, much of this risk can be averted. **GT**

Paul Pilon is a Perennial Production Consultant and editor-at-large of the Perennial Pulse e-newsletter. Feel free to contact him with article topics or to address your perennial production challenges. He can be reached at paul@perennialsolutions.com.