

Winter is coming: protecting container nursery stock from adverse weather events[©]

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INTRODUCTION

The fall can be a great time to take a step back from the pressures of the growing season and to reflect on the year. The plants are dormant, pressure to water constantly has been reduced substantially and the extreme cold weather that will be coming has yet to arrive; time to take a deep breath. But any sense of tranquility soon disappears when the realities of winter and what it can bring comes forward. Prides Corner Farms (PCF) goes to great lengths to ensure that our nursery stock is adequately protected. And it does not stop with winter protection. Our plants are under assault throughout the year from events created by Mother Nature. Talking about the weather is not enough. Preparing for what she dishes out is important. Let's start.

OVERVIEW

Since 2011 in Connecticut, we have experienced two hurricanes, a substantial snowfall in October, record winter snowfalls, and a drought of considerable duration. In 2011 alone there was record snowfall in the winter, Hurricane Irene in August, a snowstorm in October (8 weeks after Irene) that left 800,000 electric customers without power in Connecticut, and a *Cylindrocladium* outbreak (Boxwood Blight) that forced us to destroy thousands of plants. What a year. Many of these events can be managed and any problems mitigated just as long as you adequately prepare.

Drought

Water is a finite resource that very few nurseries have the luxury of consuming without the risk of restrictions. During time of drought it is important to have a plan that allows the nursery manager to stretch out his or her water supply without compromising the quality of the plant material. The most important thing to remember about drought is realizing you are in one before it is too late. Prides Corner Farms has developed what we call "Water Conservation Levels" to guide us through extended dry periods during the growing season. These levels are explained in detail here:

1. Level 1 water alert.

No current restrictions are needed. Ensure that the system is running efficiently and that leaks and clogged irrigation heads are dealt with in a timely manner.

2. Level 2 water alert.

Voluntary 25 to 33% reduction in water consumption is requested. All leaks and plugged heads are to be cleaned immediately. Watering should be looked at very carefully to make sure we are not wasting any water.

3. Level 3 water alert.

A 25 to 33% reduction in water consumption is mandatory. Managers and supervisors must monitor water consumption carefully to ensure that the reductions are being implemented. Twenty-five to 33% of the nursery must have their watering needs completed by 9 a.m. No zone or growing area can run unless leaks and plugged heads have been addressed and fixed.

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4. Level 4 water alert.

A 33 to 50% reduction in water consumption is mandatory. Fifty percent of the nurseries watering needs must be completed by 8 to 9 am. Washing vehicles on the nursery is prohibited. Blocks of plants that are not full should be consolidated to water more efficiently. No zone or growing area can be run unless all leaks and plugged heads have been dealt with. Managers and supervisors must be directly involved with any and all watering decisions.

5. Level 5 water alert.

We are in imminent danger of running out of water in 10 days to 2 weeks or less. Water reductions of 50 to 75% are mandatory. As many plants as possible must be consolidated to reduce the area of the nursery that needs water. Seventy-five to 100% of the nursery's watering needs must be completed by 8 to 9 a.m. Managers and supervisors must take complete control and responsibility for watering needs. Washing of any equipment on the farm is prohibited.

Over-wintering strategies

1. Temperature protection.

Great effort goes into ensuring that the plants grown by Prides Corner Farms are protected from any winter weather event. Whether that event is extreme cold or substantial snow, we need to be able to react in a way that mitigates any damage. More than half the plants grown by PCF would be difficult, if not impossible to over-winter without some form of additional protection. The nursery is located in USDA Zone 6a where the average annual extreme minimum temperature is -10 to -5°F. Prides is in USDA Zone 6a: the average annual extreme minimum temperature is -10 to -5°F. Fortunately there are many plants that do just fine with minimal attention; that is placing them in an over-wintering structure and covering them with a white sheet of over-wintering film is adequate for their survival. Here are the plants that survive with minimal protection (Table 1).

Table 1. Plants that survive with minimal protection.

<i>Amelanchier</i>	<i>Sorbaria</i>
<i>Aronia</i>	<i>Spirea</i>
<i>Betula</i>	<i>Symphoricarpus</i>
<i>Callicarpa</i>	<i>Taxus</i>
<i>Chionanthus</i>	<i>Thuja</i>
<i>Forsythia</i>	<i>Viburnum dentatum</i>
<i>Hamamelis</i>	<i>Viburnum opulus</i>
<i>Hydrangea paniculata</i> cultivars	<i>Viburnum rhytidophyllum</i>
<i>Hydrangea arborescens</i> and cultivars	<i>Viburnum trilobum</i>
<i>Ilex verticillata</i> and cultivars	<i>Wisteria</i>
<i>Juniperus</i> (most)	<i>Sambucus</i>
<i>Malus</i>	<i>Salix</i>
<i>Philadelphus</i>	<i>Rhus</i>
<i>Physocarpus</i>	<i>Rhododendron catawbiense</i> taxa
<i>Picea</i>	<i>Rhododendron</i> 'PJM'
<i>Potentilla</i>	

Then there are the plants that we feel require additional protection as shown in Table 2. There are various reasons for protecting these plants. As shown some plants have fairly high root kill temperatures and need additional protection to protect the roots specifically. These plants are indicated by the letter "R". Still others require protection from leaf desiccation, indicated by the letter "D". Some plants do fine through the winter but can be a

challenge during the transition period between winter and spring waking up too early, indicated by the letter “T”. The letter “H” refers to heated house.

Table 2. Plants requiring additional protection

<i>Abelia</i> (H)	<i>Hypericum patulum</i> ‘Hidcote’ (T, H)
<i>Acer palmatum</i> cultivars (R)	<i>Ficus</i> (H)
Evergreen azaleas (D)	<i>Ilex</i> × <i>meserveae</i> , <i>I. crenata</i> cultivars (R, D)
<i>Buddleia</i> (R, T, D)	<i>Kalmia latifolia</i> cultivars (D)
<i>Buxus</i> (T)	<i>Leucothoe</i> (D)
<i>Calluna</i> and <i>Erica</i> (D)	<i>Magnolia</i> (R)
<i>Caryopteris</i> (R)	<i>Myrica</i> (D)
<i>Chaenomeles</i> (T)	<i>Osmanthus</i> (H)
<i>Chamaecyparis pisifera</i> ‘Filifera Aurea’ (D)	<i>Pieris</i> cultivars (D)
<i>Clethra alnifolia</i> (D)	<i>Rhododendron</i> ‘Scintillation’ (R, D)
<i>Cornus florida</i> (R)	<i>Rhododendron</i> ‘Capistrano’ (R, D)
<i>Cotoneaster</i> (R)	<i>Rhododendron</i> ‘Purple Passion’ (D)
<i>Cytisus</i> (D)	<i>Rhododendron</i> certain lepidotes (D)
<i>Deutzia gracilis</i> ‘Nikko’ (T)	<i>Rhododendron yakushimanum</i> cultivars (D)
<i>Hibiscus</i> (R)	<i>Rosa</i> (R, T)
<i>Hydrangea macrophylla</i> (R, T, H)	<i>Syringa</i> certain genera and cultivars (R, T)
<i>Hydrangea quercifolia</i> cultivars (R, T, H)	<i>Viburnum dillitatum</i> , <i>V. plicatum</i> f. <i>tomentosum</i> (R)

All three of these winter challenges (root kill, leaf desiccation, and spring transitional problems) can be overcome successfully by using a poly blanket within the over-wintering houses (Figure 1).



Figure 1. Creating a poly blanket within the over-wintering houses.

The amount of protection given using this blanket is illustrated clearly by the digital thermometer that reflects the temperature in the house and the temperature in the house under the poly blanket (Figure 2).



Figure 2. Comparison of outside and inside temperatures under a poly blanket.

To protect the plants from root kill and winter desiccation it is important to be a good weatherman and know what kind of weather is coming in advance. Covering the plants before a sharp cold snap keeps the root balls from freezing solid therefore protecting sensitive roots and allowing plants to replace moisture during the respiration process. Continue to use the poly blanket in the spring to cover and protect plants during the transition period in the spring.

2. Snow load.

There is no worse feeling in the world than seeing over-wintering structures that have succumbed to the weight of a heavy snow load. Prides Corner Farms mitigates these heavy snow events by proactively bracing houses before any snowfall occurs. With the advice of Dr. John Bartok, Agricultural Engineer, University of Connecticut, we place a 2 in. × 4 in. × 8 ft board every 20 ft in a house. In large houses that are 26+ ft wide it is recommended that the 2 in. × 4 in. × 8 ft boards be placed under the side purlins. For the smaller 14-ft wide houses the boards are staggered at an angle (Figure 3).

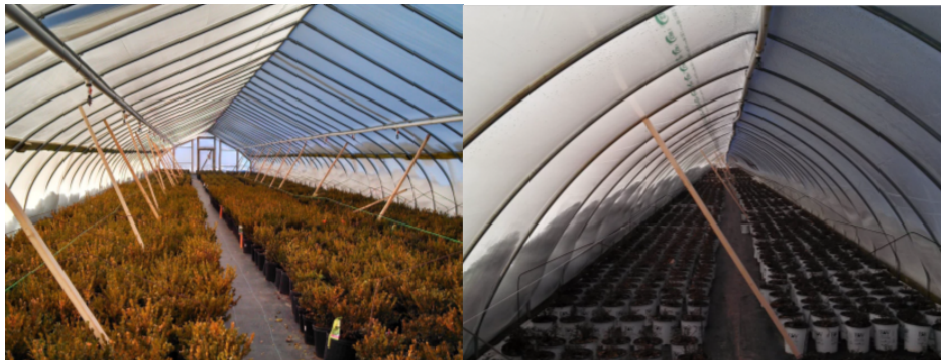


Figure 3. Placement of supports to prevent snow load damage.

CONCLUSION

Major weather events are going to happen and although they can't be stopped there are ways to protect valuable nursery stock. Being a good weather man is essential. The winter of 2013-2014 was one of the coldest we've had in a long time. Protecting your stock from the most intense weather will bring huge dividends come spring. The effort is worth it. Also, with global warming there is greater fluctuation in temperatures and the transition period during early spring can be a dangerous time for many plants if adequate protection is not given.