Overwintering Perennials

... Methods, Variables

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Overwintering Materials: Snow

best protection, usually least reliable

View from Trapp Lodge, Vermont
using geotextile “fleece”

• Few differences in survival (zone 5) for many species with one or two layers, with/ without white poly over

  – air exchange lessens temp. rise under
  – air exchange lessens disease under
  – porous so can water through
geotextile cover pot temperatures, 1/18-1/20
geotextile cover pot temperatures,
3/30-4/1

1am 1pm 1am 1pm 1am

temp. F

fleece 2 fleece
2 fleece/poly grnd cloth/2 fleece
Container soil temperatures

• often follow air temperatures closely
  – if small, space around, within a day
  – if larger, pot-pot, within 2-3 days
• even 2” snow, mulch provides moderation
  – especially during extremes when frozen
• if on nursery ground cloth fabric:
  – pots cool faster in fall
  – pots warm faster in spring
Overwintering Materials: “sandwich”

1. Cover with poly
2. Straw, fluffed
3. White poly on top

Cold climates, maximum protection, least temperature fluctuation
pot temperatures under covers
1/15-1/17

-10
-5
0
5
10
15
20
25
30
35

12am 12pm 12am 12pm 12am 12pm 12am
temp. F
open white poly microfoam/poly poly/straw/poly
spring pot temperatures under covers

4/2

temp. F

open
white poly
microfoam/poly
poly/straw/poly
foam/no poly

6am 12pm 6pm
pot temperatures
1/18-1/20

1 or 2 fleece
poly/straw/poly

22F
pot temperatures
3/30-4/1

1am 1pm 1am 1pm 1am

1 or 2 fleece poly/straw/poly

16°F
When to cover?

- more crucial when to uncover, than cover
  - Thanksgiving, April 1 (zone 4)
- usually cover late, prior to snowfall
  - early Nov. in zone 4, late Nov. in zone 6
- cut back prior to cover
  - hedge shear, weed whacker, similar
  - watered, mouse bait
When to uncover?

- Uncover as soon as snow goes
  - Early Mar. in zone 6, late Mar. in zone 4
  - Plants will grow, less damage if uncovered and hardened
- May use frost fabric, one layer fleece as needed
  - Retail, reduce injury
Overwintering Materials: hoop house

- all climates
- poly layers depend on climate
- species that rot under covers
- ability to control growth in spring with minimal climate control
- must have good ventilation to avoid high temperatures in winter
Maximum protection:
USDA zone 3, Vermont

Combination:
2 layers white poly +
geotextile on flats
polyhouse temperatures 1/14-1/20

-30
-20
-10
0
10
20
30
40
50
60
temp. F

outdoors under geotextile inside

- outdoors
- under geotextile inside
Overwintering Methods

- USDA zones 3-4 and colder
  - poly/straw/poly sandwich
  - 2 layers microfoam/fleece
  - hoop house (2 layer) + fleece, heated?

- USDA zones 5-6 and warmer
  - one layer microfoam/fleece
  - hoop house (1 layer), heated?
  - coldframes
Hardiness variables

- acclimation/ deacclimation
- date of freeze
- freeze duration
- cycling temperatures (fall, spring)
- rate of thawing
- established (older) vs new plants
- moisture/watering
- fertility effects
Hardiness variables

acclimation-- effects

- **fall**: more cold may harden less hardy species, more hardy species may not benefit
- **winter**: more than 2 days just below freezing (28°F/-2°C), prior to lower temperatures, may be harmful
Hardiness variables

deacclimation-- effects

(one year: salvia, sedum)

- warm (55-65F) for as little as 5 days midwinter can deacclimate
- back down to 40F at night doesn’t help
- no differences 34, 40F and 34+/-6F
- more effect at lower subsequent freezing temps.
  - 16F/-8C and below Sedum
  - 12F/-11C and below Salvia
Hardiness variables

date of freezing

- plants not hardened by early fall
- some may be hardened sufficiently by Nov. (depends on temperature variables)
- most have maximum hardiness by Dec. or Jan.
Hardiness variables

freeze duration

• longer durations, especially at lower temperatures, may be more harmful
• less regrowth from 24-48 hrs at each low temperature vs 1/2 or 2 hrs
• no differences between 1/2 and 2 hrs
Hardiness variables

cycling temperatures

- fluctuating above and below freezing
  - here: cycle=2 hrs each temp.
- hardy species: cycling may have no benefit
- less hardy species: more than one cycle may be harmful
  - more likely in late winter, early spring
Hardiness variables

**cycling temperature ranges**

- cycling 26/38F (-3/3C) may result in more hardiness than constant 38-40F
- more injury is likely at wide cycling such as 18/47F (-8/8C)
- few differences among 1, 2, 3 cycles
- duration at each temperature (1 vs 3 days) is not as crucial as temperature
Hardiness variables

rate of thawing

- from target freezing temperatures
  - 28, 23, 16, 12, 7 °F (-2, -5, -8, -11, -14 °C)
- rapid thaw -- direct to 40 °F greenhouse
- slow thaw -- allow soil to return to 28 °F (-2 °C) then to greenhouse
- often rapid thaw had better growth, or no difference
  - less time at each low temp?
Hardiness variables

older vs newer plants

• age reflection of *vigor*
• often more vigorous are more hardy, survive at lower temperatures, than older/rootbound or recent plugs
• relates to fertility, watering
Hardiness variables

**fertility effects**

- increased N levels and durations
  - increased growth prior to, and after, freezing
  - best regrowth usually from CRF
- no effect on freezing regrowth (hardiness survival), at all freezing temperatures, from levels or durations
  - different from woody plants
Fertility dates--Karmina geranium

Sep 1

Oct 1
end weekly
20-10-20
Fertility types--Karmina geranium

20-10-20
end 10/1

Osmocote
15-9-9,
5-6 mo.

28F  21F  18F  12F  7F
Hardiness variables
moisture/watering effects

- On cultivars studied (6 genera/cvs), soil moisture caused no differences in hardiness:
  - wet 40%+ moisture, dry 10% or less
- moisture did affect growth
- suspected variable by some growers:
  - vigor? water or dry just prior to freeze?
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for more information...

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