

# Postharvest Handling of Woody Ornamentals

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## Today's Topics

- Defoliation
- Postharvest

## Why Defoliate?

- Wilted foliage
- Enhance ornamental value
- Facilitate storage
- Lessen disease
- Assist floral arrangers

## Defoliation Overview

- Natural leaf fall
- By hand
- Leaves abscise postharvest
  - Sweating
- Chemical defoliants



## Sweating



## Sweating



## Sweating



## Problems with Sweating

- Time of harvest
- Species
- Small scale
- Decreased vase life

## Problems with Chemical Defoliant

- Toxic to plants
- Toxic to humans
- Unpleasant odors
- Expensive
- Inconsistent defoliation
  - Environmental, plant and defoliant factors

## Less-Toxic Defoliant



## Defoliation Objectives

- Less-toxic defoliant
- Drought stress
- Postharvest temperature manipulation



## Pre-Harvest Results - Expt. 1



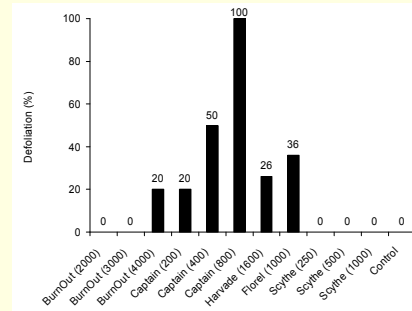
- Curly willow, North Carolina
- Harvade - 75% defoliation
  - Florel – some chlorosis
  - None of the other defoliant produced defoliation

## Pre-harvest Results - Expt. 2



- Deciduous holly, Wisconsin
- No defoliation
- Rain

## Expt. 2 Results - Bittersweet

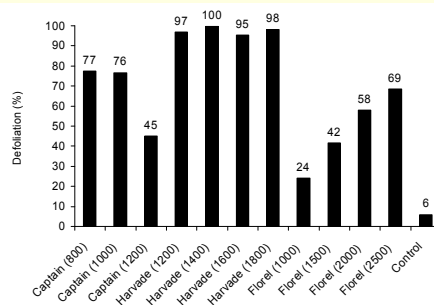


## Pre-Harvest Expt. 3

- American beautyberry, Raleigh, NC
- Harvade
- Captain
- Florel



## Expt. 3 Results - Beautyberry



## Experiment 3 - Beautyberry



## Experiment 4 - Results



- Greenhouse curly willow, Raleigh
- 3 irrigation timings
- Harvade - 88% defoliation
- Irrigation treatments not effective
- No treatment injured plants

## Defoliation

- Excellent – 90+%
- Good – 75-89%
- Fair – 50-74%
- Poor – <50%

## Pre-Harvest Defoliation - Conclusions

	Harvade (1600 ppm)	Captain (800 ppm)	Florel (1000 ppm)
Bittersweet	Poor	Excellent	Poor
Curly willow	Good	Fair	Good
Beautyberry	Excellent	Good	Fair (2500 ppm)

## Postharvest Defoliation

- 41, 68 or 95°F
- 1, 3, 5, or 7 days



## Postharvest Results – Curly willow

- Holding at 68°F was optimal – 68% defoliation
- 41°F = 53% defoliation
- 95°F = 28% defoliation
  - Holding for longer periods of time further decreased defoliation

## Defoliation Recommendations

- Pre-harvest rather than postharvest
- Apply defoliants on a warm, humid fall day
- No rain for 24 hours



## Costs for Defoliants

- Florel at 2500 ppm - \$5.11/gal
- Captain at 800 ppm - \$0.26/gal
- Harvade at 1200 ppm - \$0.23/gal
- BurnOut at 4000 ppm (20% defoliation) - \$0.35/gal
- Scythe at 1500 ppm (0% defoliation) - \$0.20/gal

## Postharvest

#1 reason Americans don't buy more cut flowers?

**Short vase life**

## Harvesting Woody Cuts

- Larger harvest window
- Optimum time depends on
  - species
  - market
  - facilities for cooling
  - preservatives



## Bucket Basics

- Use white buckets
- Replace buckets often
- Dry before storing or stacking



## Bucket Basics

- Clean buckets with detergent or bleach after every cutting
- Automated bucket washers



## Making the Cut

- Cut long stems
- Cut early in the morning or late in the evening
- Cut into water or hydrator
- If cut into air, recut
- Soak floral foam first

## After the Cut

- **What about...**
  - Recutting under water?
  - Using warm water?
  - Burning the end?
  - Water level in the bucket?

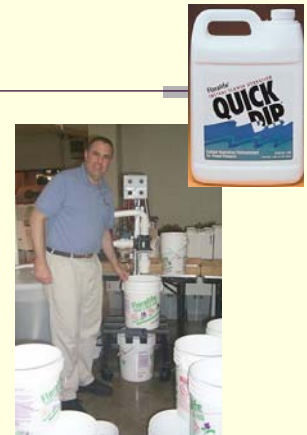


## After the Cut

- **Hydrating solutions**
  - Are acidic
  - Use on species that wilt quickly / are hard to rehydrate

## Preservatives

- Contain
  - acidifiers
  - sugar
  - biocides
- Commercial products
- Make-your-own



## EthylBloc

- Effects are similar to STS
- Powder that becomes a gas
- Apply in an enclosed area



## Temperature Regulation

- Cool temperatures are more important to increased vase life than anything else!
- Set coolers at 33-35°F
- Used coolers
- Portacooler for \$1200 (see The Flower Farmer or [www.attra.org](http://www.attra.org))



## Storage in the Cooler



- Relative humidity
- Wet vs. dry
- Ethylene

## Postharvest Research

- Average vase life of 9 species
- Pre-treatments
  - Very hot water, 10% sugar pulse, 1-MCP, lower pH water
- Effects of storage
- Floral foam



### Postharvest Flowering Species

Species	Vase Life (days)
Butterfly bush	5.5-6.6
Oakleaf hydrangea	2.1-3.9
<i>Viburnum tinus</i>	8.8-15.0

### Postharvest Foliage Species

Species	Vase Life (weeks)
Boxwood	6.6-8.1
Japanese holly	6.6-10.9
Waxmyrtle	2.2-9.9

### Postharvest Fruiting Species

Species	Vase Life (weeks)
Nellie Stevens holly	9.0-11.6
Privet	2.4-3.2
Pyracantha	1.0-1.3

### Postharvest Results

- None of the pre-treatments extended the vase life of:
  - Oakleaf hydrangea (*Hydrangea quercifolia*)
  - Boxwood (*Buxus sempervirens*)
  - Japanese holly (*Ilex crenata*)
  - Nellie Stevens holly (*Ilex* 'Nellie R. Stevens')
  - Privet (*Ligustrum sinense*)
  - *Pyracantha coccinea*

### Postharvest Results

- Butterfly bush
  - 1-MCP (1 day)
  - Very hot water (1 day)
- *Viburnum tinus*
  - 10% sugar (5 days)
  - 1-MCP (3.5 days)
  - Very hot water (-1 day)
- Waxmyrtle
  - 10% sugar (-5 days)

## Postharvest Conclusions

- *Myrica cerifera* and *Ilex crenata* have longer vase life, better fragrance, and faster growth rate than *Buxus sempervirens*.
- All fruiting species tested make excellent cuts
  - Long vase life
  - Little or no fruit drop
  - Retain fruit color

## Postharvest Recommendations

	No sugar	2% sugar	4% sugar
Flowers		√	√
Foliage	√		
Fruit		√	

## Postharvest Conclusions

- Can woody cuts be used in foam?
  - Shortened vase life
  - Boxwood is the exception

## Conducting Your Own Trials



- With new species and cultivars
- With water source changes
- With new preservatives
- With seasonal changes

## Thanks, y'all!

- |                 |                  |
|-----------------|------------------|
| ■ John Dole     | ■ John Zehrer    |
| ■ Jessica Hyatt | ■ Harold Wilkins |
| ■ Sara Lane     | ■ Scott Aker     |
| ■ Ingram McCall | ■ ASCFG          |
| ■ Diane Mays    |                  |

## This is the end...

