

*Using Botany  
To Sustainably Manage  
INVASIVE  
PLANTS  
Rose Hiskes*



**CAES**

The Connecticut Agricultural Experiment Station

Putting Science to Work for Society since 1875



# Connecticut Invasive Plant Management Calendar



Created by Emmett Varricchio and members of The Connecticut Invasive Plant Working Group

These species were the Top 10 species of concern as identified by attendees of the 2016 CIPWG Symposium

	January	February	March	April	May	June	July	August	September	October	November	December
Japanese Knotweed ( <i>Polygonum cuspidatum</i> )												
Oriental Bittersweet ( <i>Celastrus orbiculatus</i> )												
Japanese barberry ( <i>Berberis thunbergii</i> )												
Multiflora Rose ( <i>Rosa multiflora</i> )												
Mugwort ( <i>Artemisia vulgaris</i> )												
Garlic Mustard ( <i>Alliaria petiolata</i> )												
Autumn Olive ( <i>Elaeagnus umbellata</i> )												
Common Reed ( <i>Phragmites australis</i> )												
Mile-a-Minute ( <i>Persicaria perfoliata</i> )												
Swallow-wort ( <i>Cynanchum louiseae</i> )												

Flowering Period Chemical: Foliar Cut/Paint Injection Mechanical: Cut Pull Mow

Note this calendar serves as a working draft of best management practices for managing invasive plants in Connecticut.

Please use proper safety practices when working with herbicides and equipment.

For additional information please visit <https://cipwg.uconn.edu/> and download the 2018 symposium presentation 'Connecticut's Invasive Plant Management Calendar: "The Top 10 Invasive Plants"'

# Botany

Why would botany be important in invasive plant management?

- Accurate plant identification
  - Japanese stiltgrass vs. *Leersia*
- Accurate life cycle information
  - Mugwort and seed viability
  - Japanese knotweed and seed production and viability
  - 'Morden's Pink' *Lythrum* and sterility

# Plant Life Cycles

- Annual – winter or summer
  - Flowering, seed maturity, germination, longevity
- Biennial – 2 years seed to seed, dies
- Monocarpic perennial – 3+ years seed to seed
- Herbaceous perennial – spreading, solitary
- Woody perennial – live for many years

# Plant Physiology

- Conducting Systems in Plants
  - Circle of straws
    - Three circles
  - Flow up - transpiration
  - Flow down
- Spring in perennials flow is UP
- Fall in perennials flow is DOWN

# Reproduction & Dispersal

- Seed
  - Seed longevity in soil seed bank
  - Dispersed by wind, birds, wildlife, streams, shoes
- Rhizomes – underground stems
  - Dispersed by soil movement, tires, shoes, water
- Stems: root at nodes
  - Stolons lateral stems along the ground
  - Upright stems





**Japanese Knotweed – *Fallopia japonica***  
**Japan via England**

# Botany of Japanese Knotweed

- Spreading herbaceous perennial
- Flowers:
  - August into September
  - Different flower types: perfect, female only
- Reproduction: by rhizomes and seed in types with perfect flowers
- Dispersal: by movement of root pieces and winged seed dispersed by wind







**Oriental Bittersweet – *Celastrus orbiculatus***  
**Japan, China**



# Botany of Oriental Bittersweet

- Woody, deciduous vine, dioecious
- Flowers: May and June
  - In leaf axils all along stem
- Reproduction: by seeds and root suckers
  - Seed is viable 2 – 3 years in the soil
  - Root suckers come up over root zone
- Dispersal: birds eat berries, fly and defecate the seed.





# Horticultural Introduction – 1860.







**Japanese and Common Barberry – *Berberis spp.*  
Japan and Europe**

# Botany of Japanese Barberry

- Woody deciduous shrub
- Flowers late April to June
- Reproduction
  - Seed ripens in August, viable 1 – 2 years in soil
  - Clonal shoots below ground
  - Branch tips root when they touch soil
- Dispersal
  - Turkeys and other wildlife eat and disperse seed





**Flowers from mid-April to May.**





# Garlic Mustard – *Alliaria petiolata* Europe



3,000 seeds/plant



# Botany of Garlic Mustard

- Evergreen biennial, monocarpic perennial
- Flowers: April 13, 2023 through June
- Reproduction: by seed produced in late July which continues to develop after they are picked. Live 2 – 5 years in soil.
- Dispersal: seed moved on shoes, car tires, water

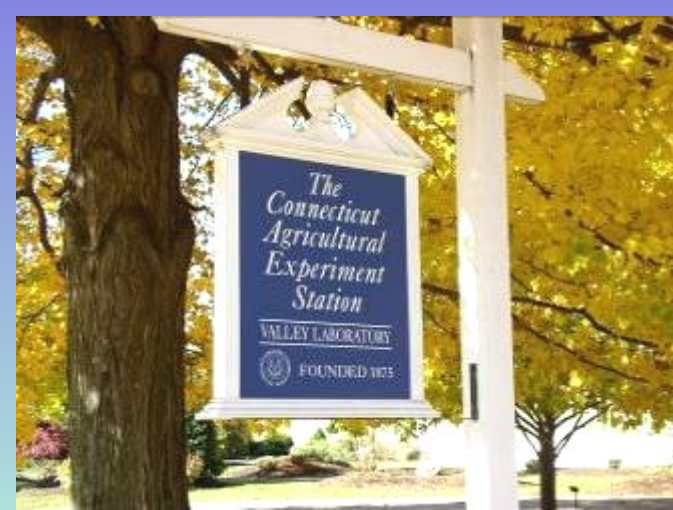




**Likely introduced for food & medicine,  
1868 Long Island.**



**Flowers April – June.**



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