



**Virginia
Cooperative
Extension**

Virginia Tech
Virginia State University



Native Plant Species & Cultivars

Sustainable Landscaping 2024



Challenges to gardeners

- Nursery stock dominated by non-native ornamentals
- Large Mid-Atlantic nurseries carry only 25% native species
- Majority of those native plants only available as cultivars
- Lack of information on sources of plants & how they were propagated



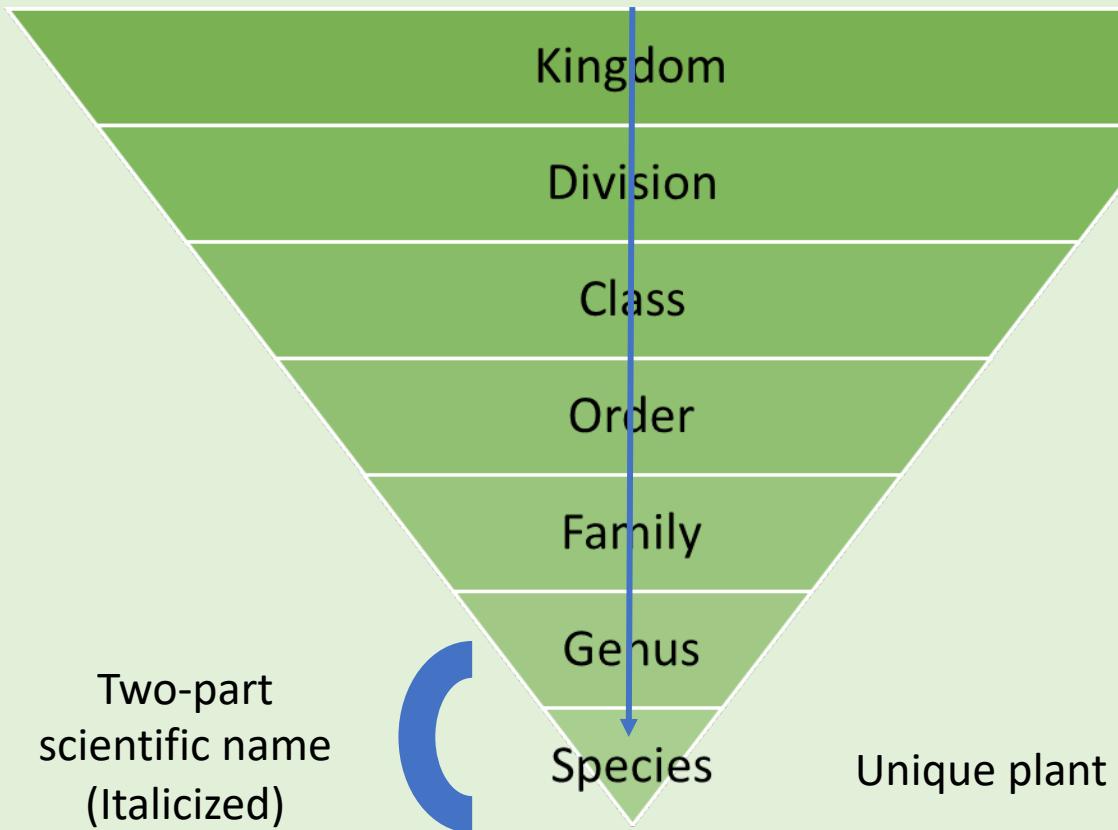


Overview

- Definitions of botanical terms
- Trials of woody plants
- Trials of herbaceous plants
- Recommendations & Resources



Hierarchy of plant classification



Plants

Woody plants w/ compound or lobed leaves & multi-petaled flowers

Insect-pollinated

Lobed leaves & winged samaras

Species

- Genetically distinct plant form found in the wild in a particular geographic region
- No human involvement in its evolution
- Has evolved as part of an ecosystem
- Interacts with other plants that share the same physical environment
- Has special relationships with animals as part of food web:
 - Nectar & pollen for insects
 - Fruit & seed for birds & other animals
 - Larval host plant for Lepidoptera



Species

- Reproduces sexually through pollination of its flowers & production of seed
- Has genetic variability to adapt to changes in environment
- May also reproduce vegetatively (asexually) by:
 - Rhizomes (horizontal underground stems)
 - Stolons (runner, stem along ground)
 - Suckering (forming sprouts at base)



Cultivar

- Cultivated variety of a species
- Larger role of horticulture trade in bringing certain plants to market
- Named and propagated by a nursery
- Name in single quotes (not italicized) following species name
- E.g., *Phlox paniculata* 'Bright Eyes'
- Cultivars of native plants sometimes referred to as “nativars”



“Discovered” Cultivar

- Can originate from a naturally occurring individual mutation within a species
- Discovered by a horticulturist in a wild population
- Judged distinctive enough to market
- Referred to as “a natural selection”
- May be produced commercially by seed (genetically variable) or propagated vegetatively for volume efficiency

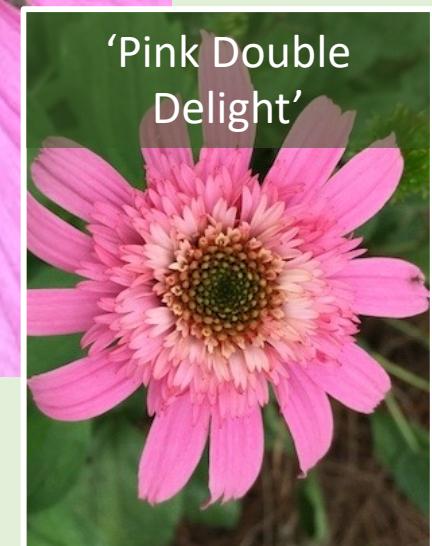
Mutation with large, gray-green pubescent foliage and dense mat-forming habit
Found on property near Virginia Beach, VA



Named for nearby Lynnhaven River

“Bred” Cultivar

- Result of selective breeding for certain traits preferred by humans
- Propagated vegetatively to retain desired traits in offspring
- Lack genetic variability to promote biodiversity (clones)
- Chosen cultivar name often reflects a featured characteristic
- May also have trademark name
- E.g., *Viburnum dentatum* ‘Christom’
BLUE MUFFIN®



Hybrid

- Cross-pollination between two species in same genus
- Can occur in nature with plants in proximity (within 500')
- Resulting seed = new plant
- Most created by plant breeders
- Combine traits of both parents
- Ideally indicated by “x” in the scientific name



X =



Displays intermediate characteristics, a blend of colors of the parents

Trials of Woody Plants

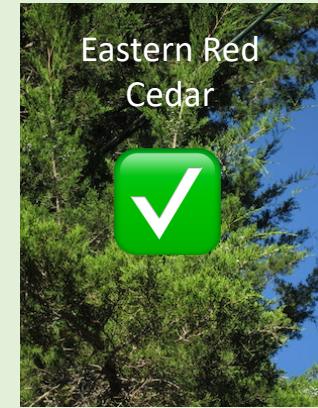
Baisden/Tallamy study of woody plants

- Experimental garden at Mt. Cuba Center, Hockessin, DE (2014-2016)
- Studied potential impact of cultivars on insect herbivores
- Focus on feeding of the caterpillar stage of butterflies & moths
- (Tallamy's "Ten-step Rule")
- Measured effect of 6 traits of trees and shrubs on feeding preference
- Insects collected via vacuum sampling



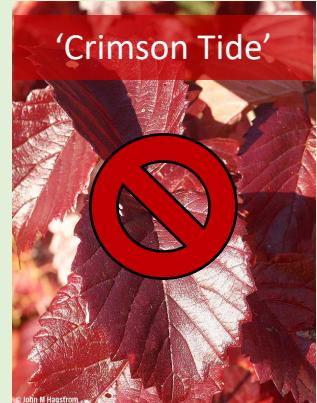
Impact of leaf color change

- Compared three species/cultivar pairs:
 - Eastern Red Cedar / ‘Emerald Sentinel’
 - Winged Sumac / ‘Lanham’s Purple’
 - Arrowwood / ‘Red Feather’
 - Cultivar foliage change (blue, purple or red)
- Clear feeding preference for species
- Replacement of chlorophyll by anthocyanins or carotenoids = deterrent
- **Species with unchanged leaf color = best choice as larval host plants**



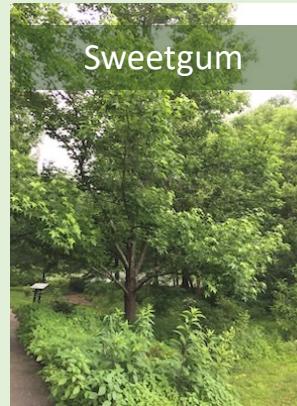
Impact of intense fall color

- Compared three species/cultivar pairs:
 - Arrowwood / 'Crimson Tide'
 - Red Osier Dogwood / 'Baileyi'
 - Red Maple / 'Red Sunset'
 - Cultivars with more intense coloration
- Clear feeding preference for species
- **Species with unchanged fall color = best choice as larval host plants**

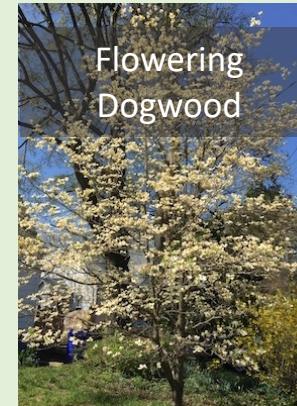


Measuring effects of additional traits

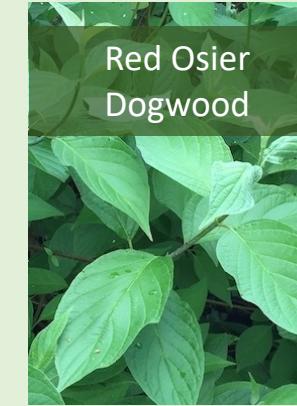
- Comparison for:
 - Growth habit
 - Disease resistance
 - Variegated foliage
 - Enhanced fruit size /yield
- Mixed results
- No evidence that these traits degrade insect-based food webs
- **Cultivars acceptable to insect herbivores as larval host plants**



Sweetgum



Flowering
Dogwood



Red Osier
Dogwood



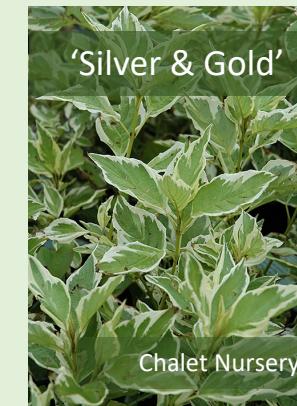
Highbush
Blueberry



'Slender
Silhouette'



'Appalachian
Spring'



'Silver & Gold'



'Chandler'

Simpson Nurseries

Impact of leaf color

Common Ninebark

Physocarpus opulifolius

- Green, lobed leaves
- Host plant for caterpillars of:
 - Io Moth
 - Bluish Spring Moth
 - Glorious Habrosyne
 - Hitched Arches Moth



Numerous cultivars of Ninebark

- 'Amber Jubilee'
- 'Aurea'
- 'Burgundy Candy'
- 'Caramel Candy'
- 'Center Glow'
- 'Coppertina'
- 'Dart's Gold'
- 'Diabolo'
- 'Ginger Wine'
- 'Lady in Red'
- 'Lemon Candy'
- 'Luteus'
- 'Nanus'
- 'Nugget'
- 'Snowfall'
- 'Summer Wine'
- Sweet Cherry Tea'



Some modified
for height



**Ornamental but cannot
serve as larval host plants**



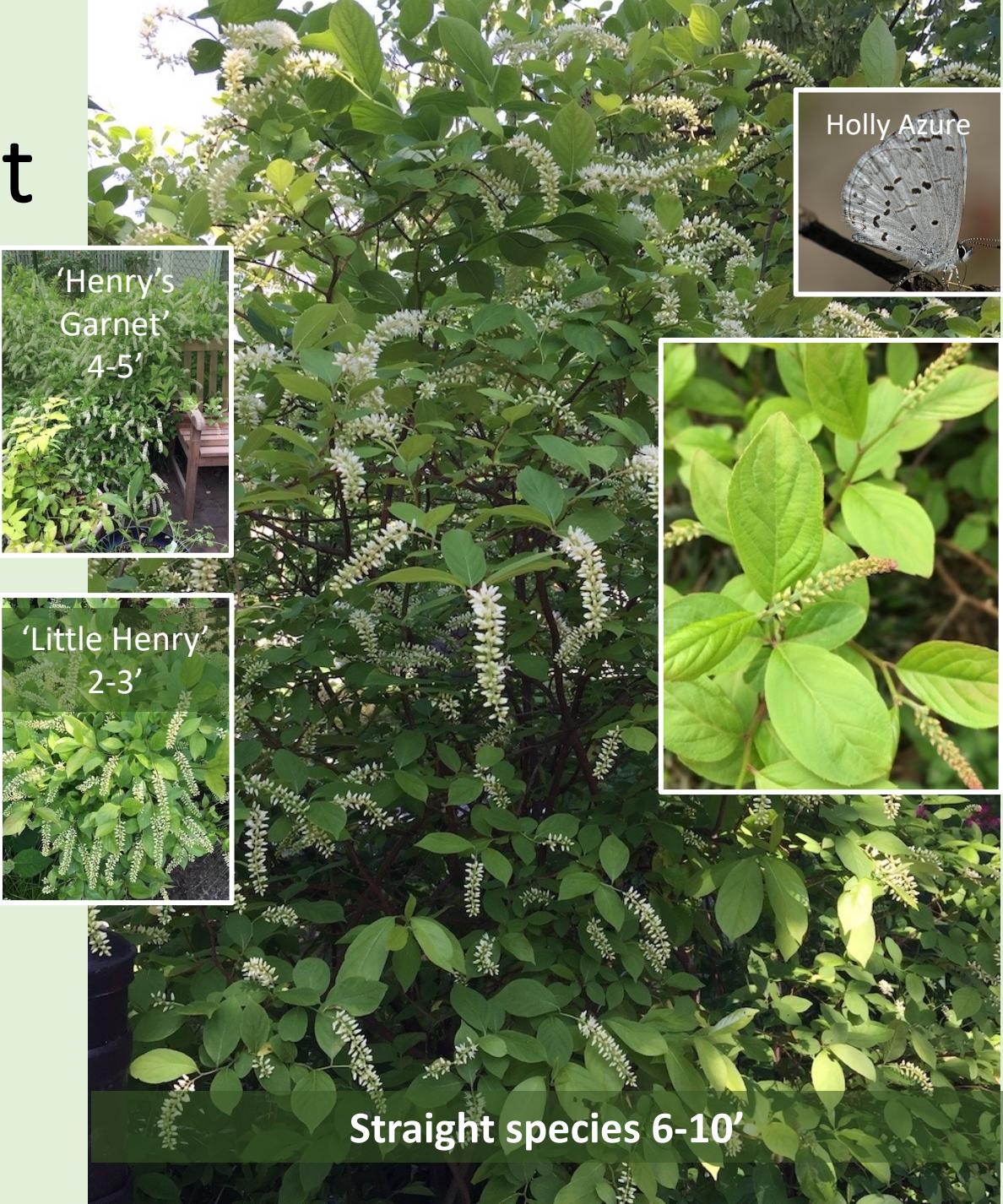
Most modified
for leaf color

Impact of modified height

Virginia Sweetspire

Itea virginica

- Host plant for caterpillar of American Holly Azure
- Leaves & flowers of cultivars appear unmodified
- **Shorter cultivars acceptable for caterpillars and pollinators**



Straight species 6-10'

Impact of modified height

Black Chokeberry *Aronia melanocarpa*

- Leaves and flowers unmodified
- **Cultivars acceptable for caterpillars and pollinators**
- Fruit of shortest cultivar is close to ground height
- **Raises questions about comfort of birds feeding at that level**



WHICH BIRDS FEED AT WHICH HEIGHT?



6-10 FEET
HIGH TREES
Woodpeckers



6-10 FEET
TREES



5-10 FEET
MID-LEVEL TREES
Chickadees and Titmice



5-7 FEET
MID-LEVEL
Bluebirds



LOWER LEVEL
Cardinals and Finches



3-6 FEET
FLOWERS & BUSHES
Hummingbirds



1-5 FEET
GROUNDFEEDERS
Sparrows and Towhees



Impact of fruit size

Highbush Blueberry

Vaccinium corymbosum

- Leaves and flowers unmodified
- **Cultivar acceptable for caterpillars and pollinators**
- Impact of enhanced fruit on birds
- **Larger fruits require more manipulation & may be hard for birds to swallow**



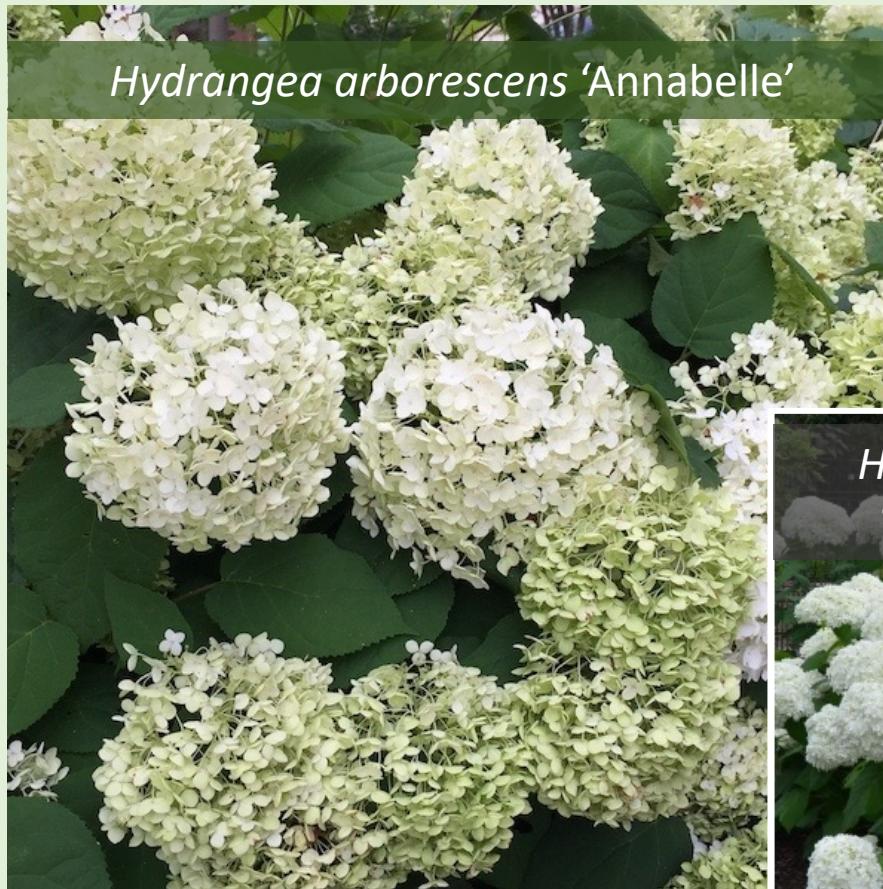
Mt. Cuba trials on Wild Hydrangea & cultivars

- Trial conducted 2017-2021
- Species (*Hydrangea arborescens*) blooms in June on new wood
- Inflorescences consist of hundreds of white fertile flowers
- Flower color is not affected by pH of soil as with non-native species



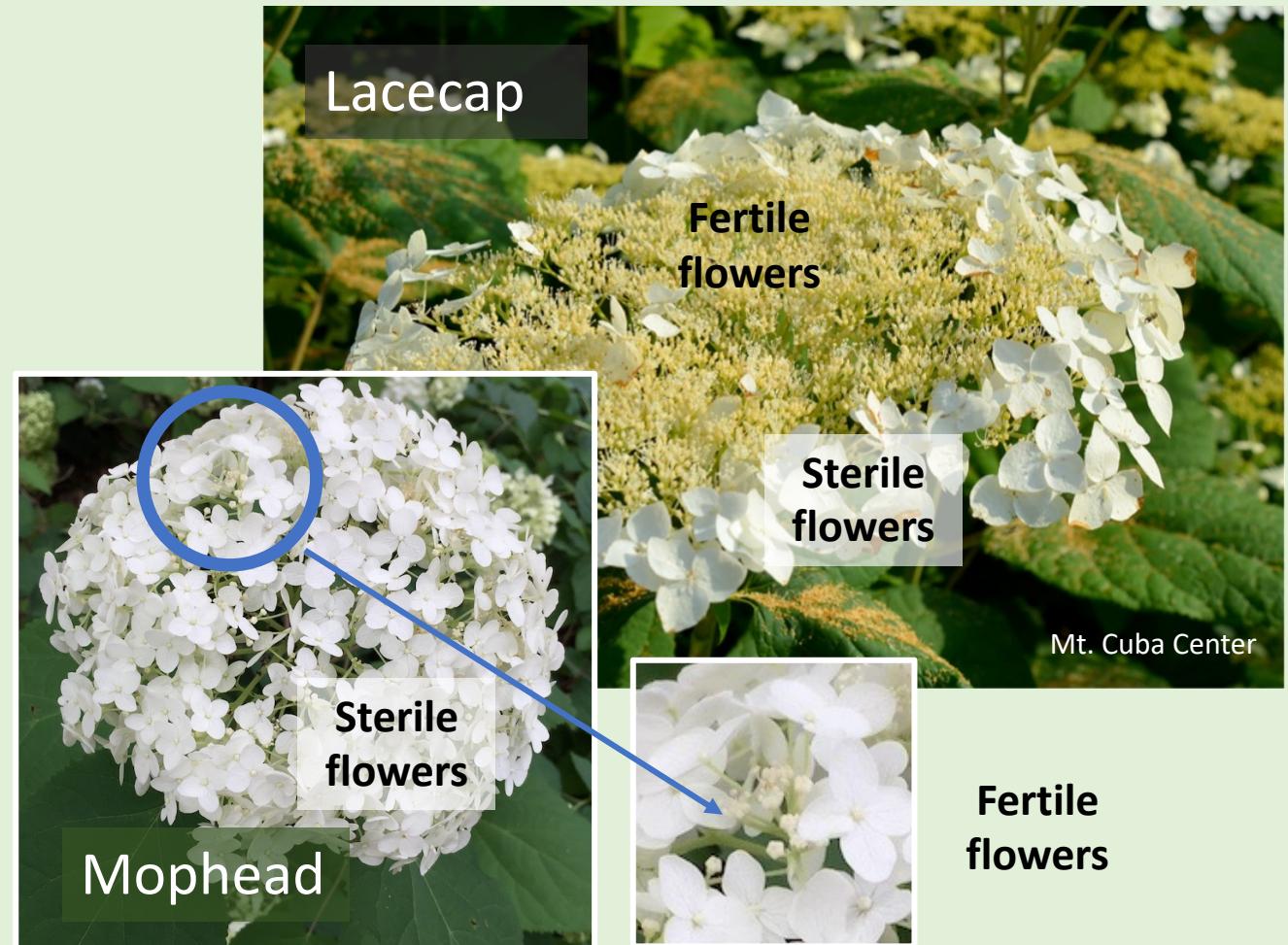
Early cultivars of Wild Hydrangea

- Naturally occurring variants with mophead mutation
- Produced commercially as
 - *Hydrangea arborescens* 'Grandiflora'
 - *Hydrangea arborescens* 'Annabelle'
- Weak stems & floppy habit due to large size of flowerheads



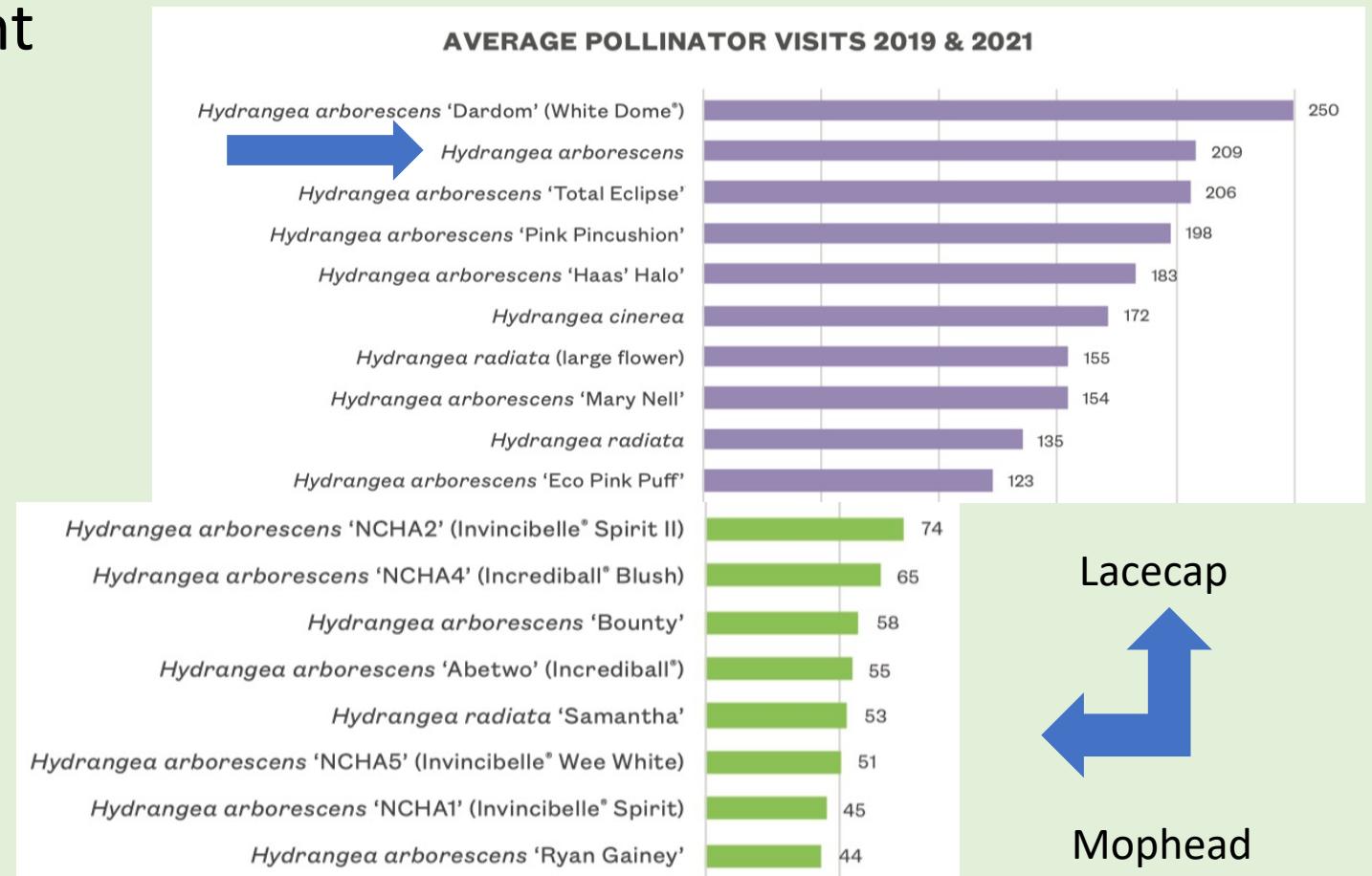
Newer cultivars of Wild Hydrangea

- Result of selective breeding for desirable garden traits:
 - Compact habit
 - Sturdy stems
 - New flower forms & colors
- Two categories of flower forms:
 - Lacecap – fertile flowers with showy ring of sterile flowers
 - Mopheads – masses of sterile flowers, few hidden fertile flowers
- Mopheads especially popular, but don't support pollinators

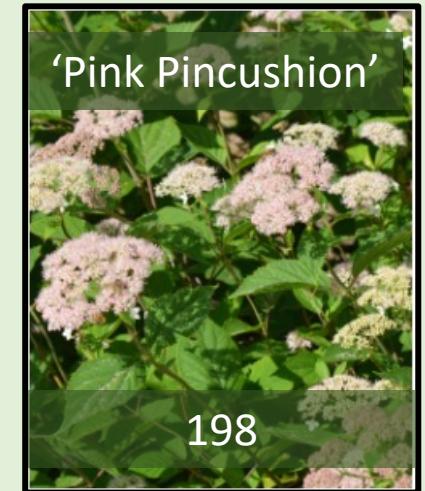
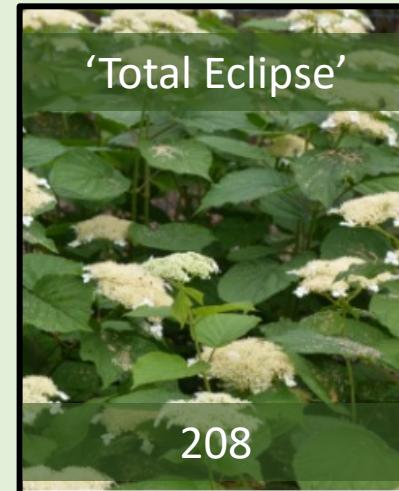


Pollinator visitation to Wild Hydrangeas

- Visits recorded during plant plant trials in 2019 & 2021
- Observations recorded by Pollinator Watch Team
- Daily observations during bloom season
- **Lacecap preferred over mophead**



Top-rated Wild Hydrangeas for pollinators



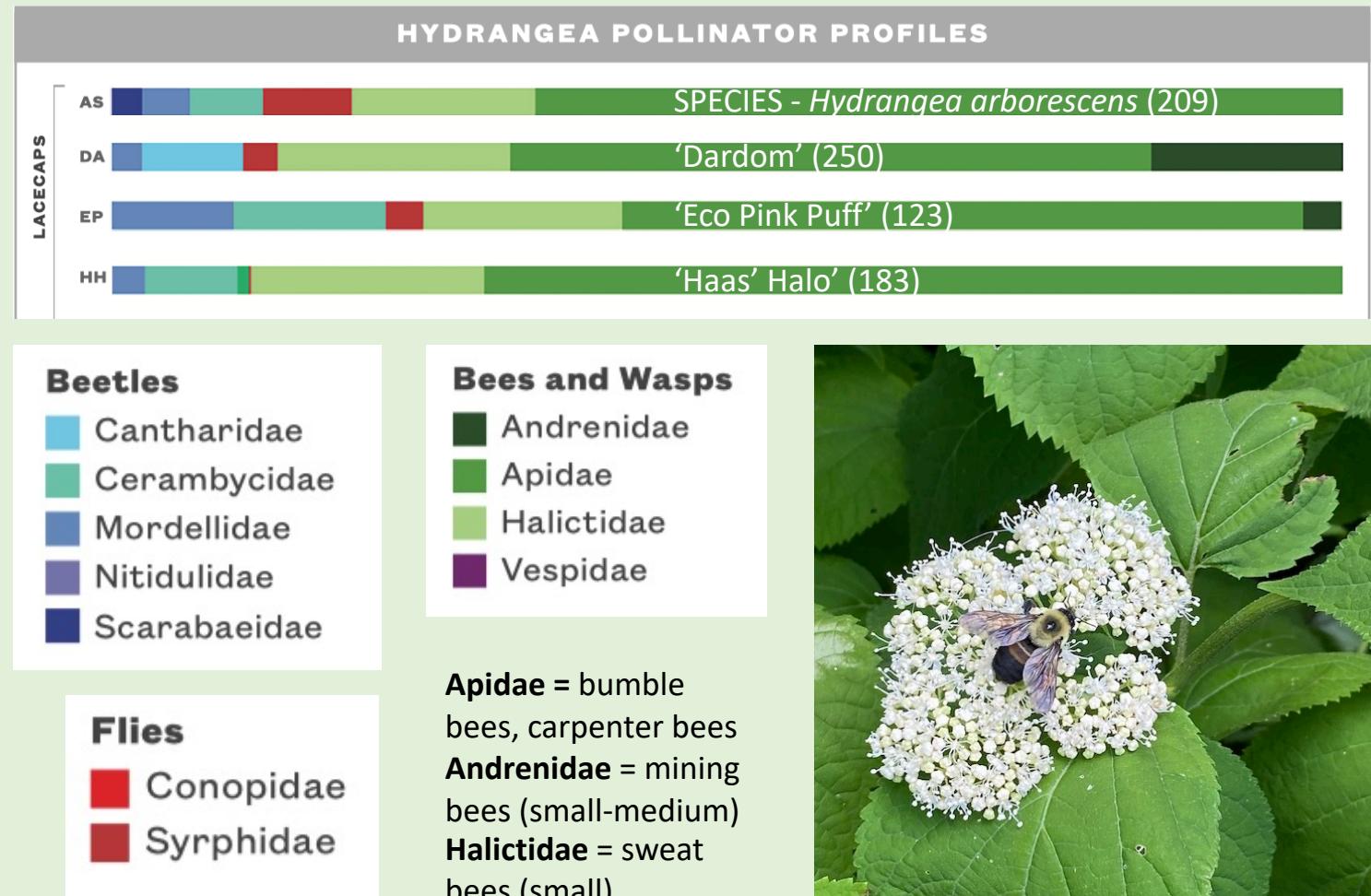
One cultivar of
Hydrangea arborescens
ranked above
the species

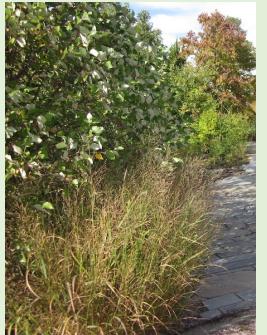


Straight species
generally
preferred
among
lacecaps

University of Delaware pollinator study

- Conducted 2018 in Mt. Cuba trial gardens
- Dr. Deborah Delaney & Lindsey Cathcart, U of DE
- Filmed inflorescences for 10-minute intervals
- Reviewed footage to ID and count insect visitors
- Pollinators visit lacecaps more than mopheads
- **Visitation profiles vary**





QUESTIONS?



Trials of Herbaceous Plants

Penn State Extension pollinator trial

- Bees, Bugs & Blooms (2012-2014)
- Evaluating native plant species & cultivars for attracting pollinators
- Master Gardeners planted 4,500 plugs of herbaceous perennial plants at state research center
- Weekly monitoring
- Evaluation of insect visitation, plant vigor & blooming

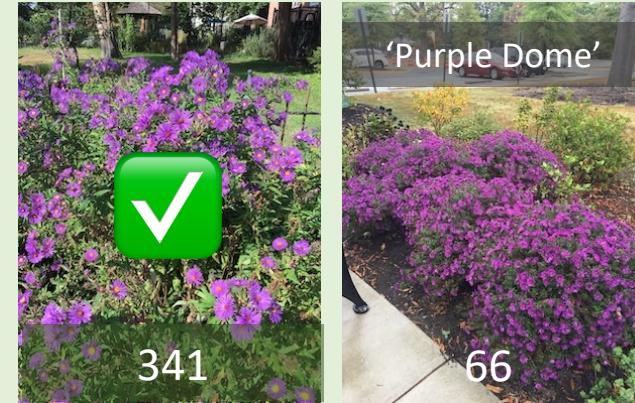


Penn State Extension

Comparison of species vs cultivars



Monarda fistulosa
Wild Bergamot



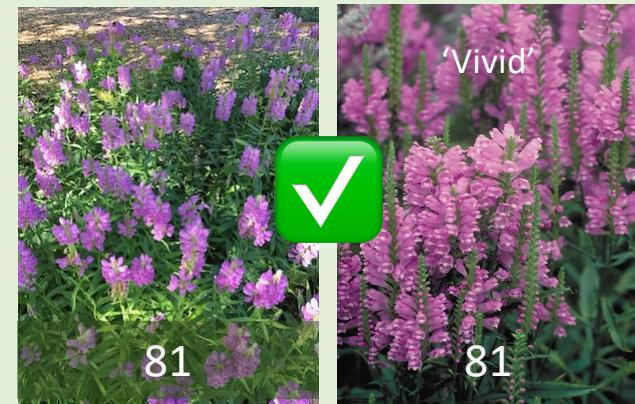
Symphytum novae-angliae
New England Aster



Penstemon digitalis
Foxglove Beardtongue



Oenothera fruticosa
Sundrops



Physostegia virginiana
Obedient Plant

**Straight species
preferred or
equal**



More comparisons

Cultivar preferred



93



98

Monarda didyma
Scarlet Beebalm



51



115

Heliopsis helianthoides
Oxeye



304



461

Symphyotrichum laeve
Smooth Aster



381



102



76

Symphyotrichum oblongifolium
Aromatic Aster



357



180



176

Coreopsis verticillata
Threadleaf Coreopsis

Conclusions

Results of 14 direct comparisons:

- ~ 50% of species better
- In other cases, cultivars outperformed species

“It appears that it is not possible to generalize that the cultivar is better than or poorer than the species.”



Top 10 plants for total pollinator visits



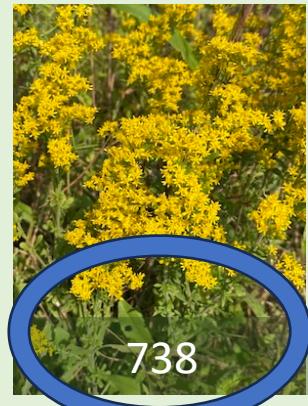
Pycnanthemum muticum
Clustered Mountain-mint



Solidago rigida
Stiff Goldenrod



Eryngium yuccifolium
Rattlesnake Master



Solidago nemoralis
Gray Goldenrod



Eupatorium hyssopifolium
Hyssop-leaf Thoroughwort



Liatris microcephala
Dwarf Blazing Star



Eutrochium dubium
Coastal Plain Joe-pye-weed



Asclepias incarnata
Swamp Milkweed



Monarda fistulosa
Wild Bergamot



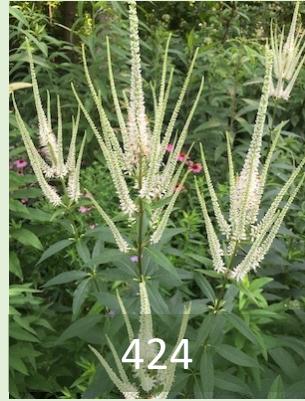
Symphytum laeve
Smooth Aster

Second 10 plants for pollinator visits



426

Eupatorium perfoliatum
Common Boneset



424

Veronicastrum virginicum
Culver's-root



421

Helianthus
hybrid



398

Helenium autumnale
Sneezeweed



381

Symphyotrichum oblongifolium
Aromatic Aster



358

Monarda
hybrid



357

Coreopsis verticillata
Threadleaf Coreopsis



352

Monarda punctata
Spotted Beebalm



350

Coreopsis tripteris
Tall Coreopsis



341

Symphyotrichum novae-angliae
New England Aster

Top 10 plants for insect diversity



72 insect species identified



*Pycnanthemum
muticum*



Solidago rigida



*Eupatorium
hyssopifolium*



*Eryngium
yuccifolium*



*Eutrochium
fistulosum*



*Coreopsis
tripteris*



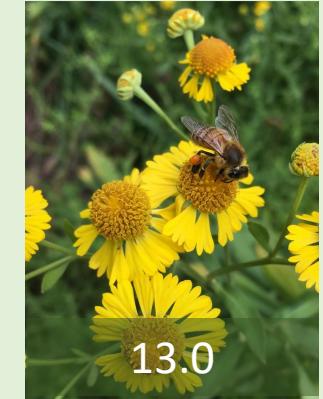
*Helianthus
divaricatus*



*Symphyotrichum
laeve*



*Eutrochium
maculatum*



*Helenium
autumnale*

Best plants for attracting specific insects



Best plants for sheer # of bee and syrphid visitors

- Clustered mountain mint (*Pycnanthemum muticum*): 19 bees/syrphids*
- Gray goldenrod (*Solidago nemoralis*): 14 bees/syrphids
- Pink tickseed (*Coreopsis rosea*): 14 bees/syrphids
- Lance-leaved coreopsis (*Coreopsis lanceolata*): 13 bees/syrphids
- Spotted joe pye weed (*Eupatoriadelphus maculatus 'Bartered Bride'*): 12 bees/syrphids
- Rattlesnake master (*Eryngium yuccifolium*): 12 bees/syrphids



Best plants for attracting bumble bees

- Lemon queen sunflower (*Helianthus 'Lemon Queen'*): 8 bumble bees*
- New England aster (*Sympyotrichum novae-angliae*): 8 bumble bees
- Purplestem aster (*Sympyotrichum puniceum*): 7 bumble bees
- Stiff goldenrod (*Solidago rigida*): 6 bumble bees
- Coastal plain joe pye weed (*Eupatoriadelphus dubius*): 6 bumble bees
- Wild bergamot (*Monarda fistulosa*): 6 bumble bees



Best plants for attracting butterflies

- Coastal plain joe pye weed (*Eupatoriadelphus dubius*): 17 butterflies/skippers*
- Blue mistflower (*Conoclinium coelestinum*): 5 butterflies/skippers
- Showy aster (*Eurybia spectabilis*): 4 butterflies/skippers
- Sweet joe pye weed (*Eutrochium purpureum subsp. *maculatum* 'Gateway'*): 3 butterflies/skippers
- Dwarf blazing star (*Liatris microcephala*): 3 butterflies/skippers

Annie White study

- Research done for PhD dissertation, University of Vermont (2012-2015)
- Evaluated differences between native wildflowers & cultivars in supporting pollinators
- Plots at two research sites (farms)
- 11 species paired with cultivars
- Visited 4 times per month, May to October in 2013 and 2014
- Visitation rates observed during 5-minute scans

Site A:

(Organic farm)
Bumble bees (43%)
Honeybees (30%)
Other bees (13%)
Flies (6%)

Site B:

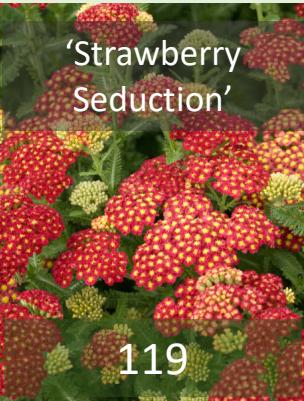
(Conventional farm)
Bumble bees (68%)
Flies (14%)
Other bees (11%)
Honeybees (Sep & Oct)



Species preferred over other forms



Achillea millefolium
Yarrow



'Strawberry
Seduction'



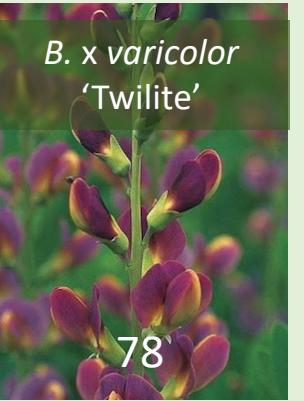
Agastache foeniculum
Anise Hyssop



'Golden Jubilee'



182



78

B. x varicolor
'Twilite'



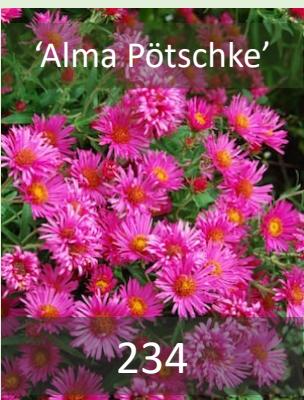
Helenium autumnale
Helen's Flower



'Moerheim
Beauty'



Symphyotrichum novae-angliae
New England Aster



'Alma Pötschke'



552



279

'Red Grape'

Additional pairings



Monarda fistulosa
Wild Bergamot



Penstemon digitalis
Foxglove Beardtongue



Rudbeckia fulgida
Orange Coneflower



Asclepias tuberosa
Butterfly-weed



Veronicastrum virginicum
Culver's-root



**Cultivars need to
be evaluated on an
individual basis**

Pollinator profiles for pairs



= species
preferred

Fewer wasps to cultivar

No bumble bees

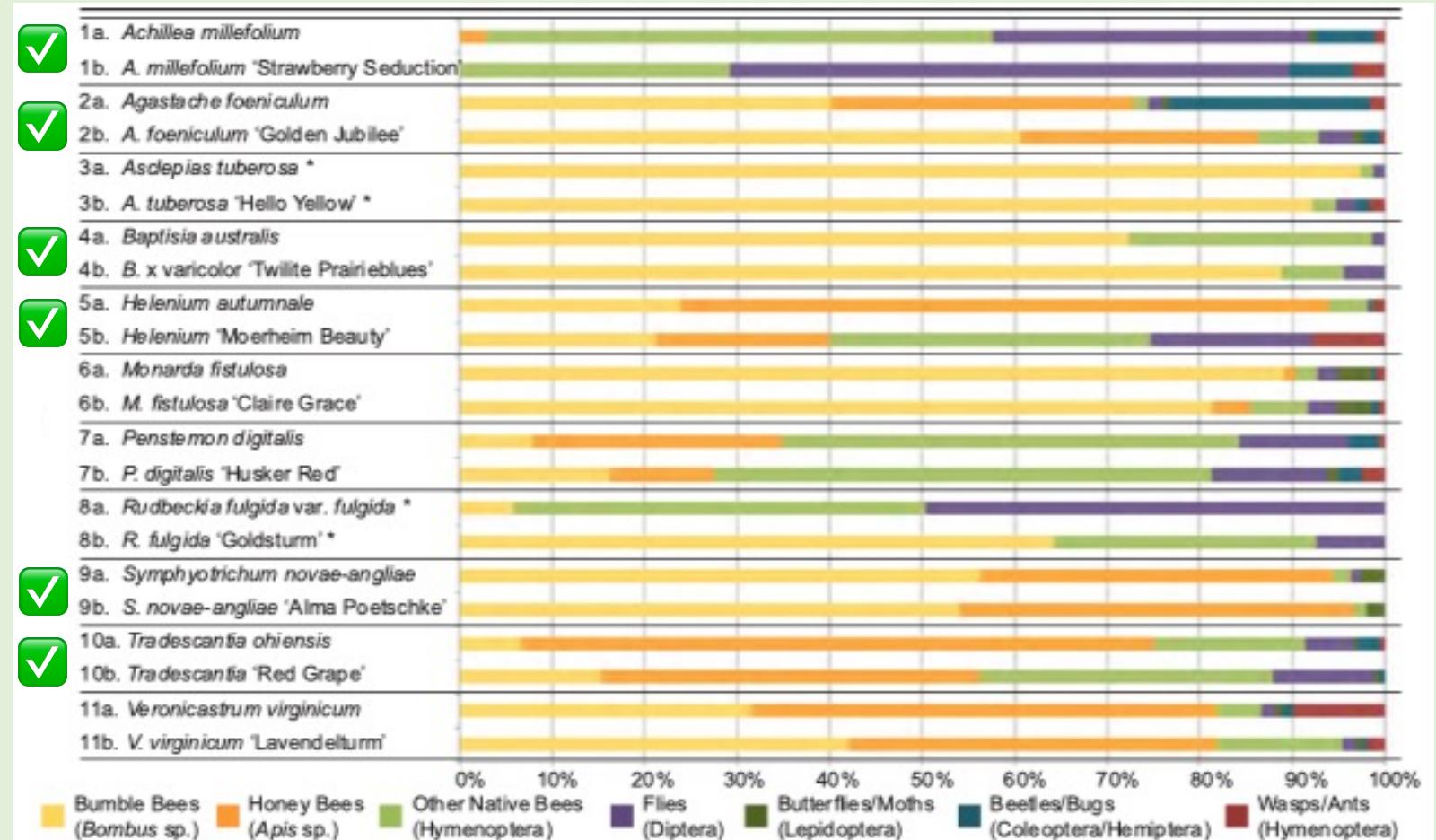
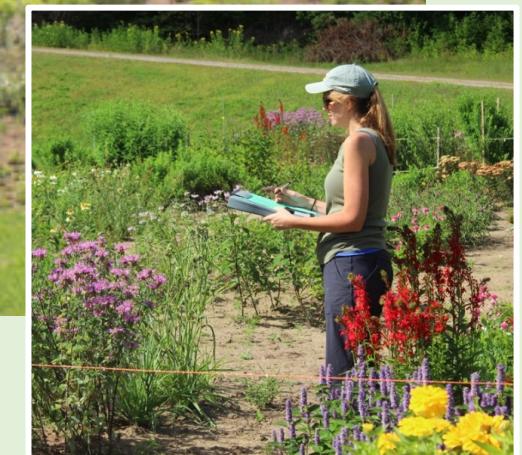
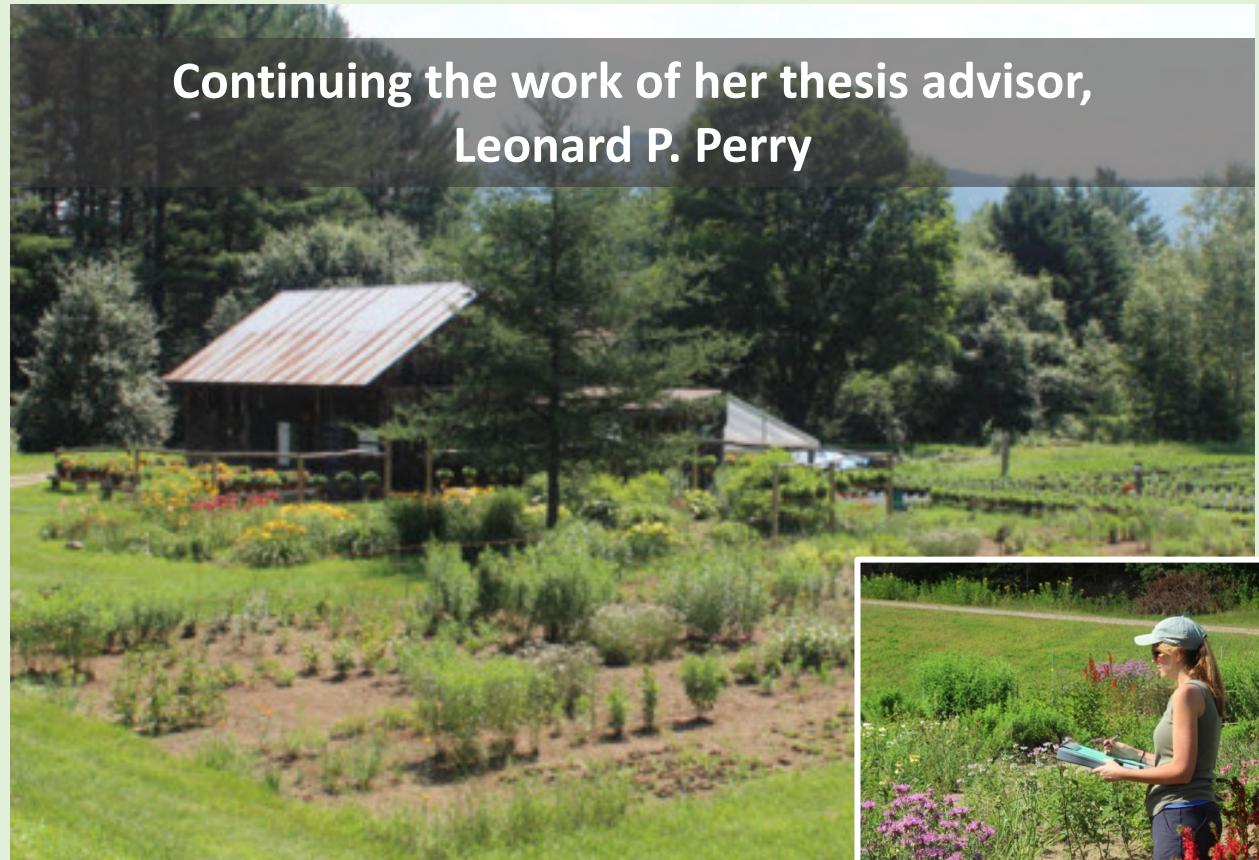


Figure 2.6. Proportions of pollinator groups observed visiting each native species and native cultivar at Site A from 2013-2015.

* Plants studied only at Site B where no honey bees were present in the landscape at bloom time.

Evaluation of Purple Coneflower & cultivars

- *Echinacea purpurea* one of most widely promoted species
- Subject of intensive breeding efforts; ~ 200 varieties
- Focus: selecting traits valuable to ornamental gardeners
- Study to evaluate benefits of cultivars & hybrids to pollinators
- Research gardens at two farms (part of larger 2013-2014 study)
- 48 five-minute observations



Plants evaluated in study & results



Species grown from seed

Popular cultivar grown from seed, same form, different color

Patented, double-flowered cultivar, propagated via tissue culture

Interspecific hybrid cultivar ('White Swan' crossed with *E. purpurea* x *E. paradoxa*)

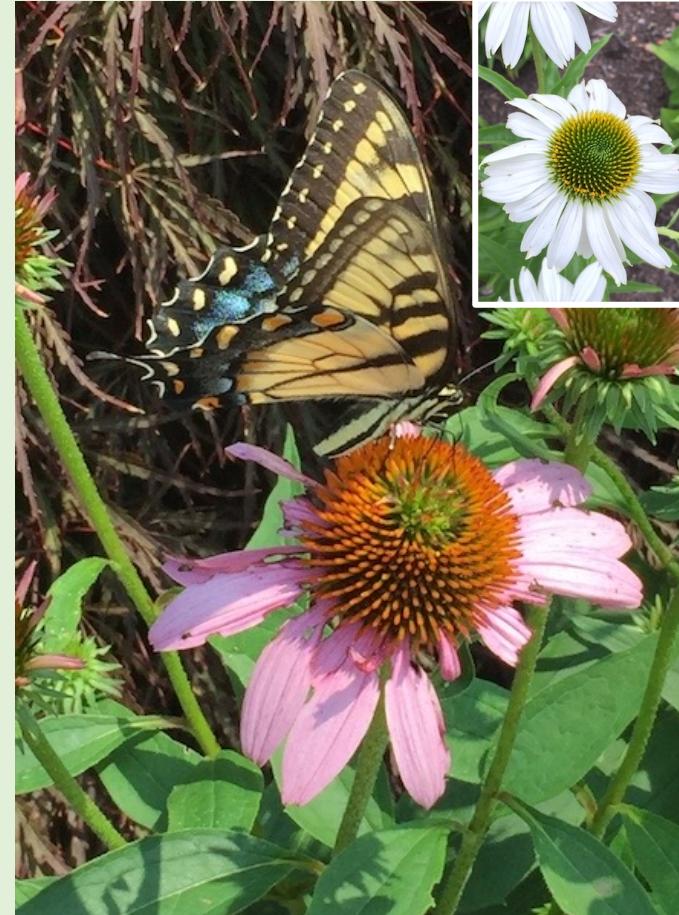
Conclusions

Breeding of cultivars & hybrids decreases pollinator support



Bee preferences significant

- More numerous
- Use both nectar & pollen



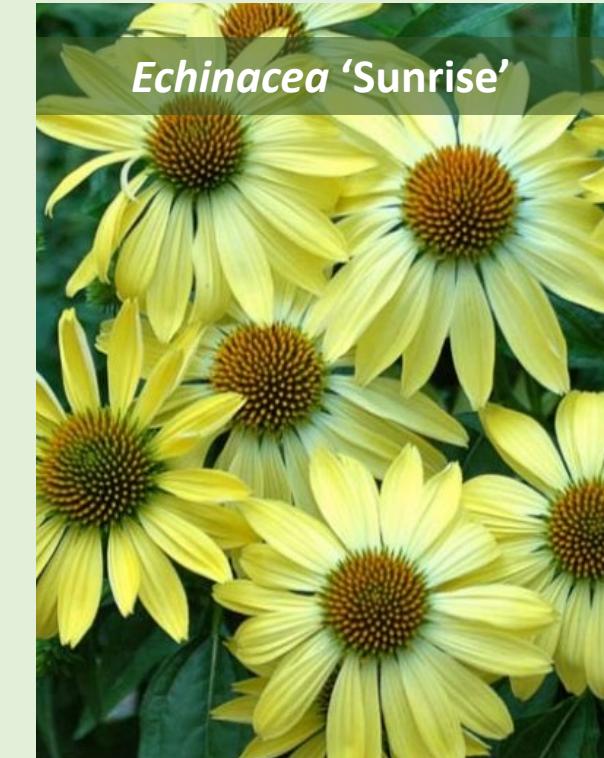
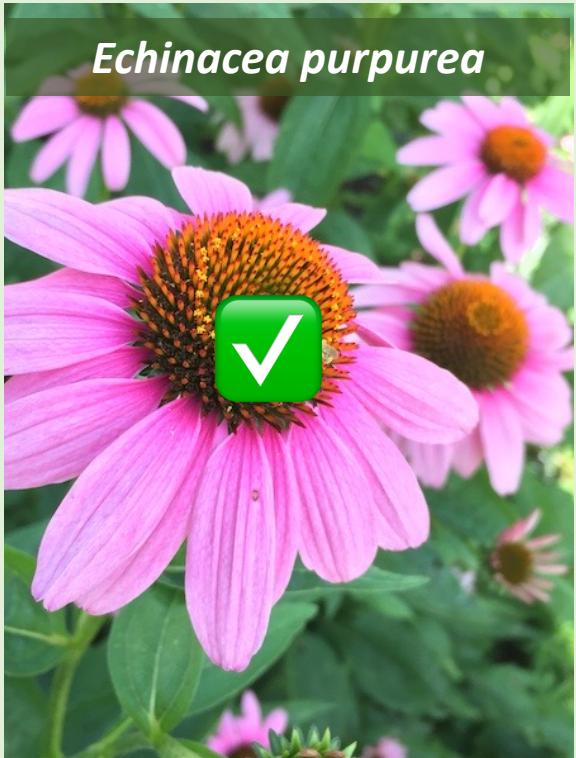
Butterflies & moths preferred species & 'White Swan'



Flies/bugs/beetles/wasps/ ants exhibited no strong preferences

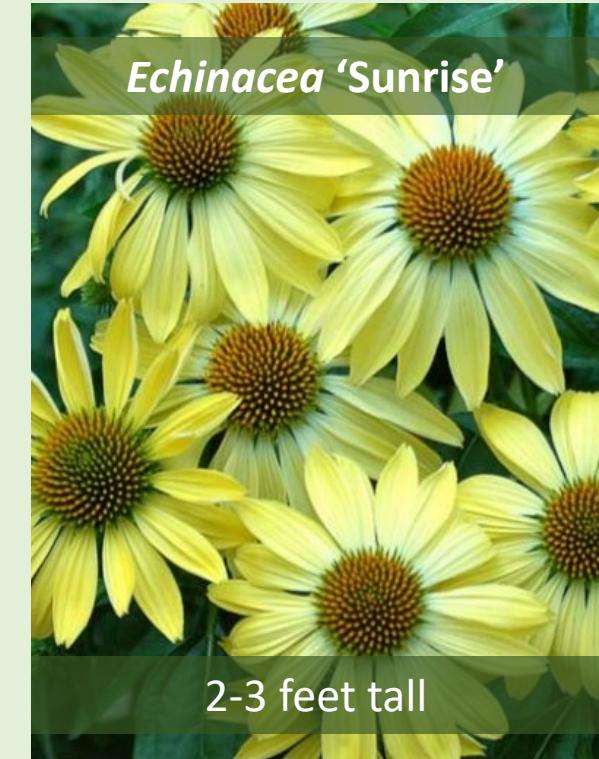
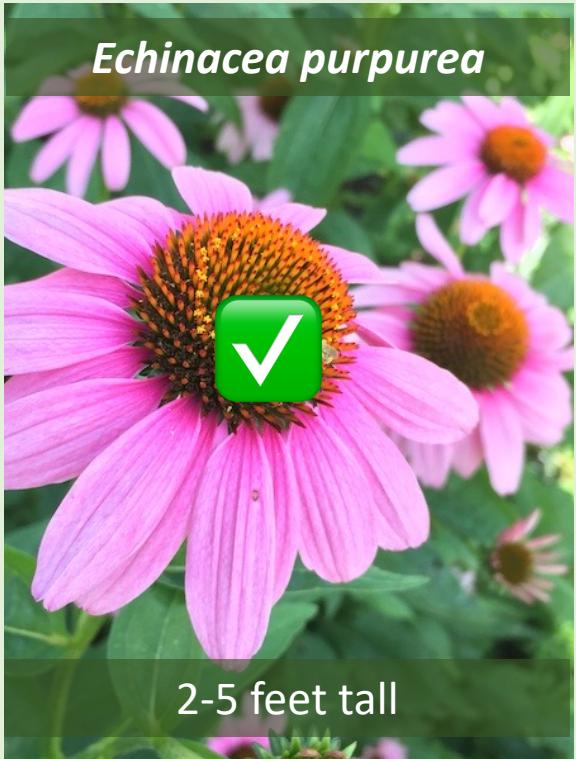
Bees strongly preferred species; then 'White Swan' over others

Effect of color trait on pollinators



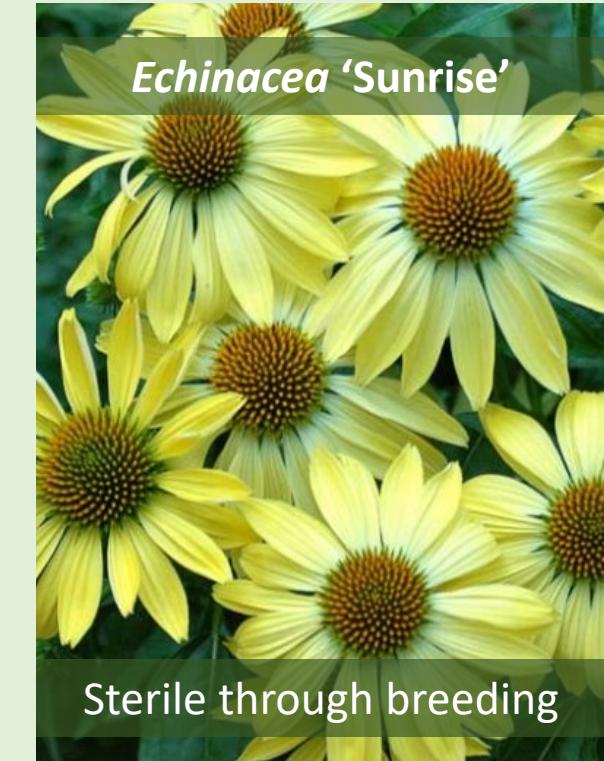
Color is a significant signal; enables pollinators to discriminate flowers at a distance.
Bumble bees are eusocial and use systems of communication to improve foraging efficiency.
Bumble bees prefer colors they have learned are associated with higher floral rewards.

Effect of size trait on pollinators



Compactness equates with fewer flowers and fewer floral rewards.
In pollinator gardens, best to make use of vertical space with taller plants.

Effect of sterility trait on pollinators



Extra petals replace reproductive parts, reducing/eliminating floral rewards.
Breeding for sterility to increase bloom duration affects nectar and pollen production.

Recommendations

- Traditional breeding done for traits humans find desirable
- Breeders should introduce selections that also maximize nectar & pollen production to support pollinator populations



Comparison of nectar production

- Measured nectar in μl with disposable microcapillary tubes
- Used refractometer to measure sugar concentration
- Discussion on nectar in thesis
- Comparison of *Lobelia* species and hybrids



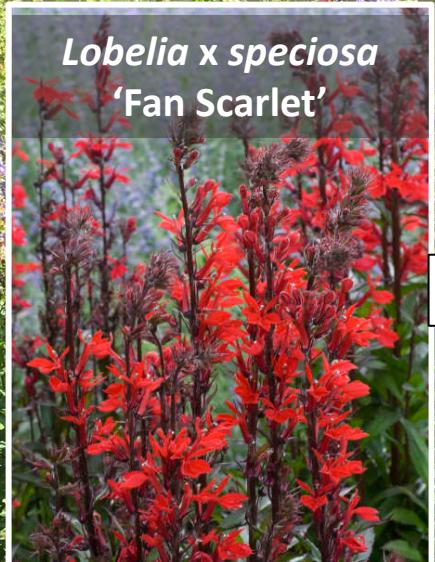


Hummingbird
pollinated



Nectar: 5.47 μL

Hummingbirds
attracted to color



Nectar: 0.72 μL

but undernourished

Lobelia x speciosa
'Fan Blue'

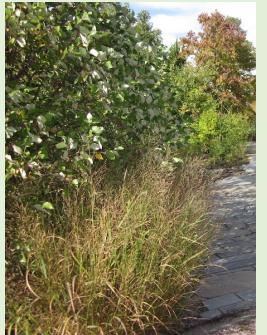
Nectar: 0.89 μL

Bumble bee
pollinated



Nectar: 0.79 μL

Hybrid modifications of flowers can have an unforeseen negative impact
on floral resources for wildlife



QUESTIONS?



Additional Research on Herbaceous Plants

Mt. Cuba Center

- Non-profit botanical garden
- Former du Pont estate near Wilmington, DE
- Grows plants native to Piedmont region of Mid-Atlantic
- Evaluates those plants & related cultivars and hybrids
- Multi-year trials simulating home gardening conditions
- Strive to introduce desirable new plants to nursery trade

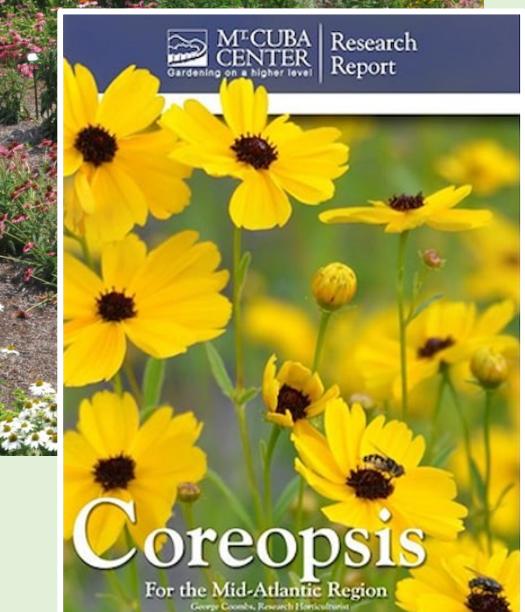
Plants rated on 1-5 scale



- Floral display
- Habit
- Winter hardiness
- Disease & pest resistance

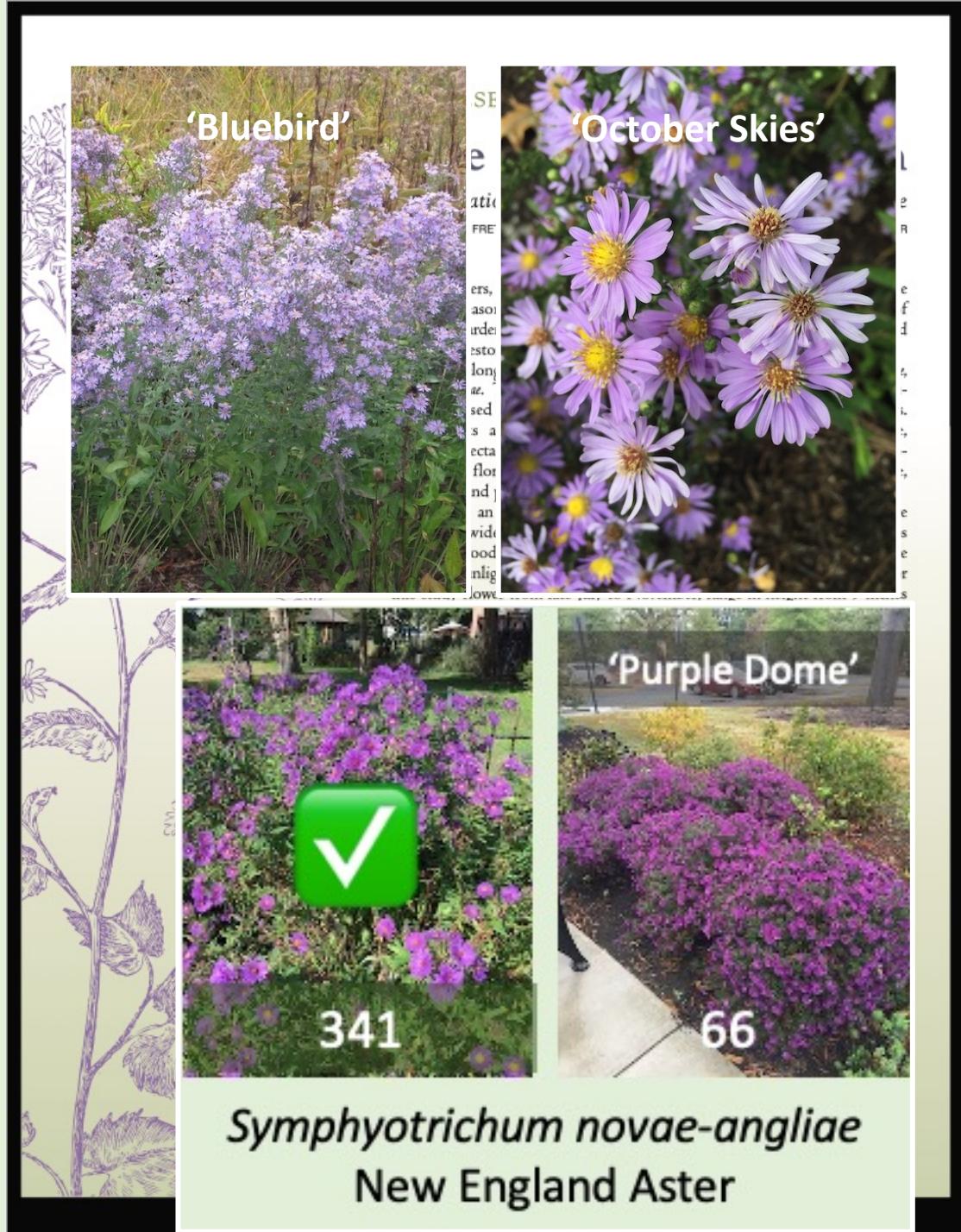


Publish reports on findings (2005 to present)



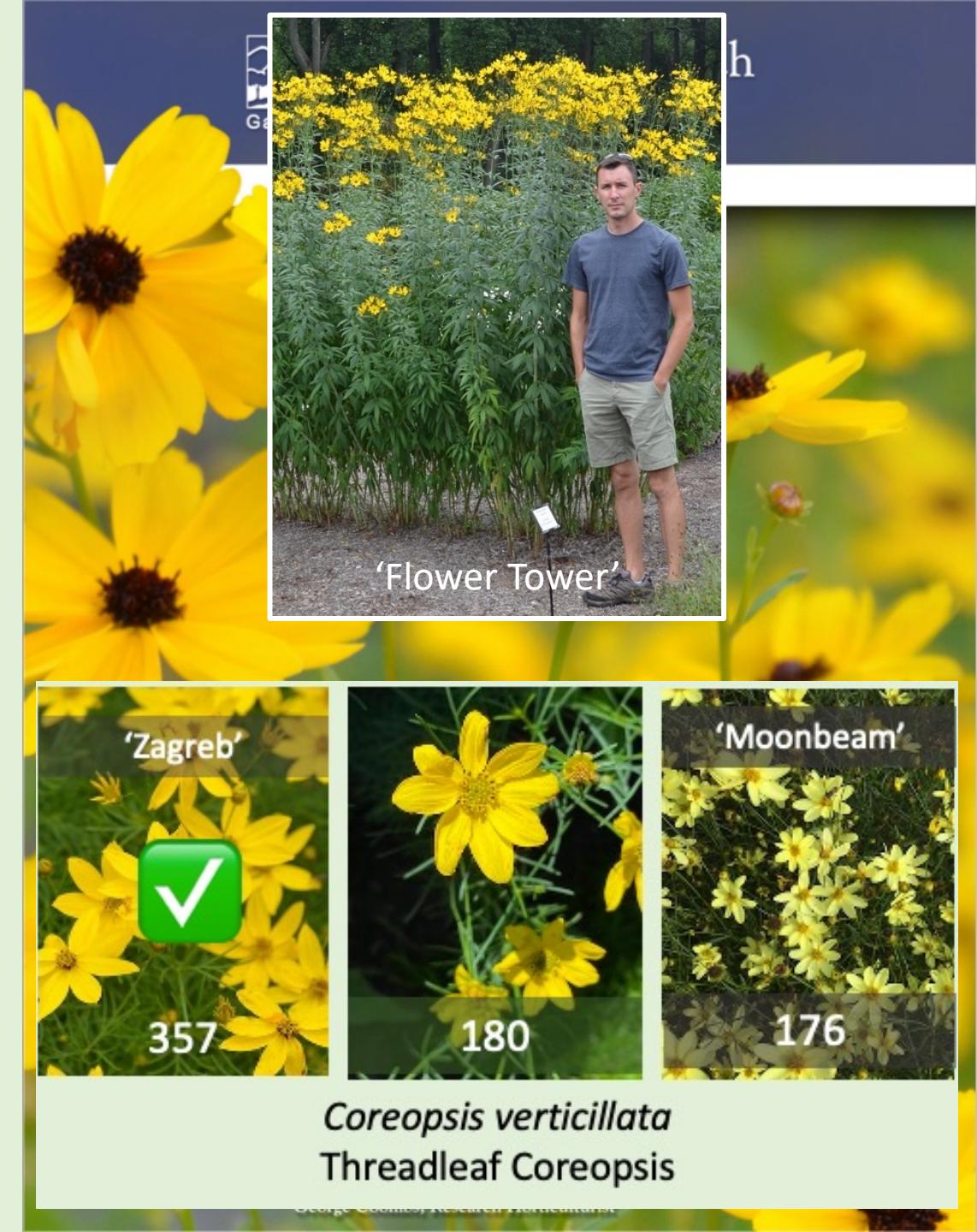
Asters

- Grew 56 species from Asteraceae Family (2002-2005)
- Measured plant performance but not benefit to pollinators
- Smooth Aster 'Bluebird' & Aromatic Aster 'October Skies' ranked high (4.8 & 4.7)
- New England Aster 'Purple Dome' (3.9) described as more manageable than species



Coreopsis

- Grew 13 perennial species and related cultivars & hybrids (2012-2014)
- Many popular cultivars performed poorly (disease/winter survival)
- Cultivars of Tall Coreopsis ranked high, (4.7) but too large for home garden
- ‘Zagreb’ cultivar of *C. verticillata* ranked above species (4.5 vs 4.4)
- Conducted pollinator diversity study: vacuum sampling & visual observation

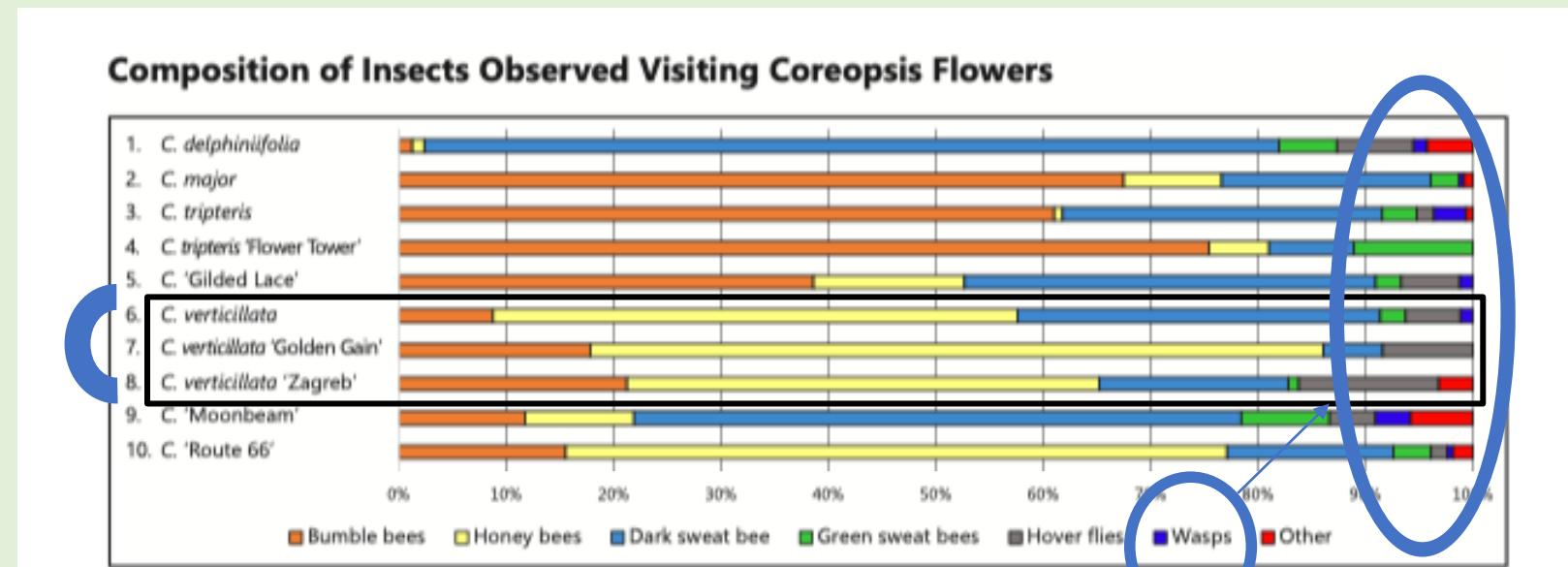


Insect visitation

1. *C. delphinifolia*
2. *C. major*
3. *C. tripteris*
4. *C. tripteris 'Flower Tower'*
5. *C. 'Gilded Lace'*
6. *C. verticillata*
7. *C. verticillata 'Golden Gain'*
8. *C. verticillata 'Zagreb'*
9. *C. 'Moonbeam'*
10. *C. 'Route 66'*



Coreopsis Pollinator Diversity (2014)	
6	species of mining bee (<i>Andrenidae</i>)
4	species of carpenter bee (<i>Apidae</i>)
1	species of honey bee (<i>Apidae</i>)
1	species of masked bee (<i>Colletidae</i>)
10	species of sweat bee (<i>Halictidae</i>)
3	species of leafcutter bee (<i>Megachilidae</i>)
9	genera of wasps (<i>Hymenoptera</i>)
3	genera of hover flies (<i>Syrphidae</i>)
2	families of beetles (<i>Coleoptera</i>)
3	families of moths/butterflies (<i>Lepidoptera</i>)

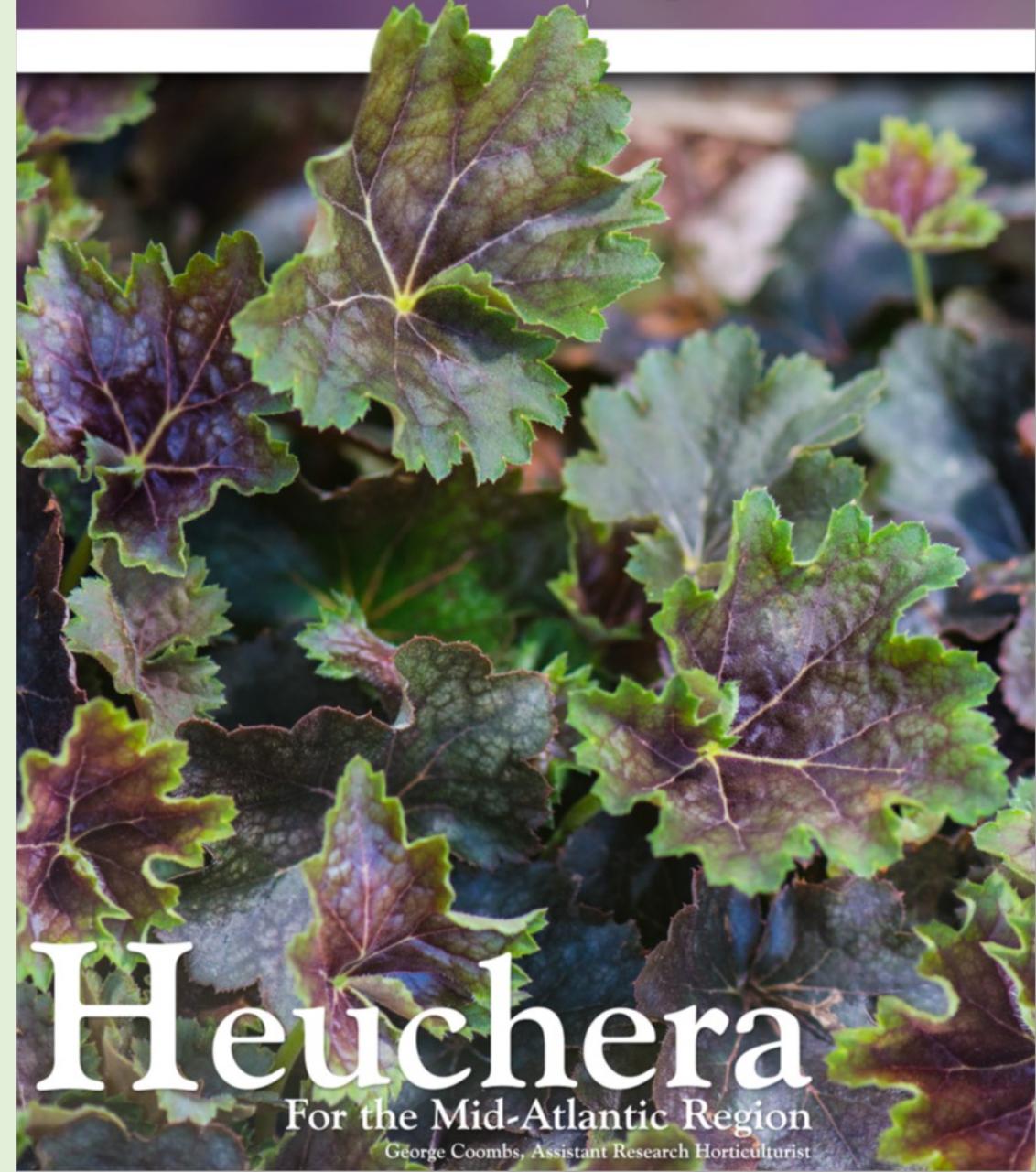


- Each plant supports a slightly different community of pollinators
- 91% bees & flies, but natural predators (wasps) also important
- Further study to determine how color, shape & pollen production affect preferences



Heuchera

- Grew 83 cultivars of popular, shade-garden perennials (2012-2014)
- Hybrids derived from native Alumroot:
 - *H. americana*: Medium-size leaves w/ scalloped edges & silver veil
 - *H. villosa*: Large, angular, hairy leaves
- Most plants rated on their foliage; floral display rated separately
- No data on use by insects



Heuchera
For the Mid-Atlantic Region

George Coombs, Assistant Research Horticulturist



Both *Heuchera* species are larval hosts for moth caterpillar



Preferred over top-rated hybrid grown for foliage color

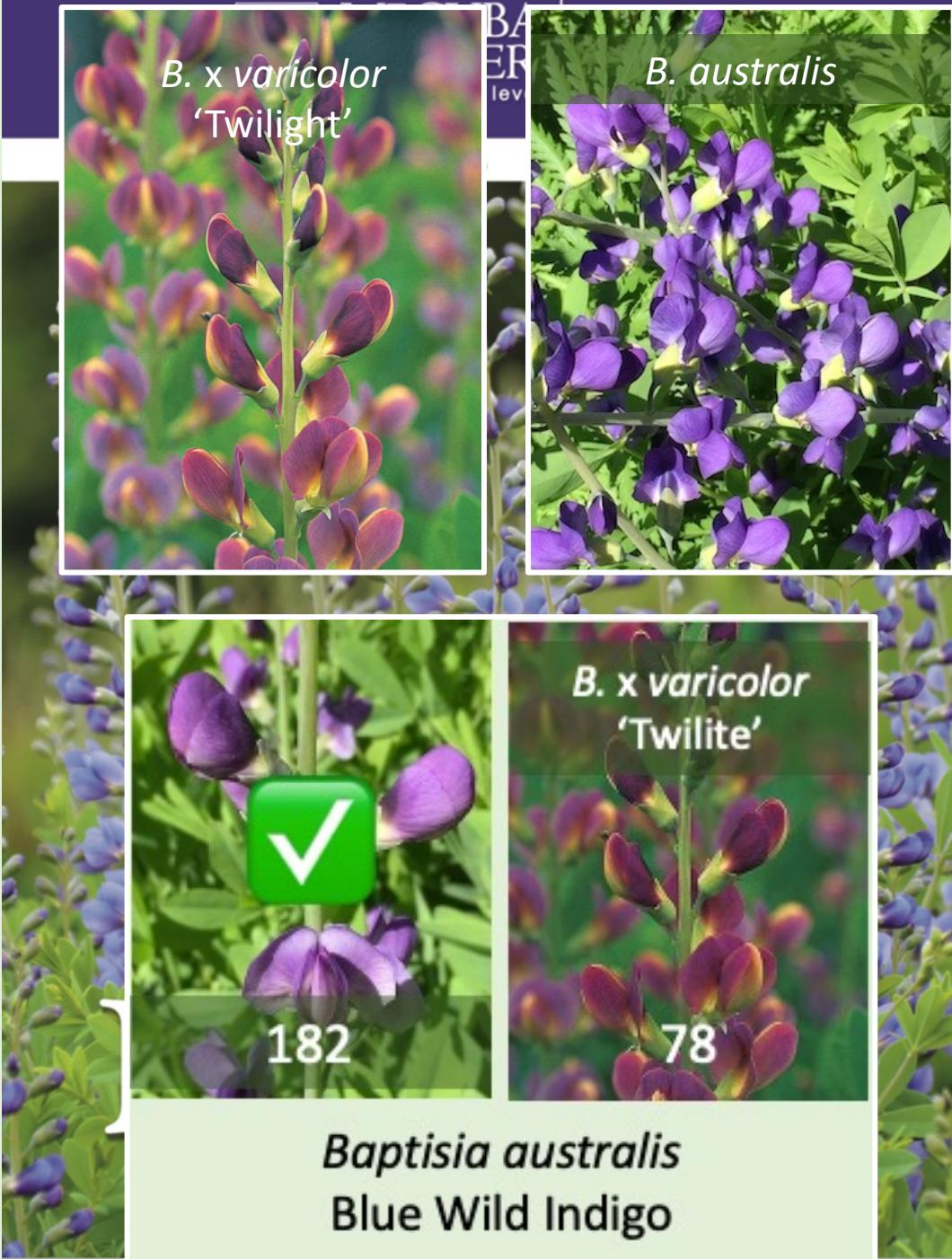


Both species provide nectar & pollen for small bees, including specialist



Baptisia

- Grew 46 selections of 11 different species (2012-2015)
- Focus on floral displays with lush, sturdy foliage
- Mention use as food source for bumble bees & larval host plant, but no comparative data
- ‘Twilite’ hybrid ranked high (4.6), above *B. australis* (3.7) and dwarf variant, *B. australis* var. *minor* (4.0)



Monarda

- Grew 40 hybrids or selections of 2 native species (2014-2016)
 - *Monarda didyma* (Beebalm)
 - *Monarda fistulosa* (Wild Bergamot)
- Breeding focus on creating compact, disease-resistant selections with large, colorful flowers
- Compact hybrids performed poorly
- Trial focus on habit, mildew resistance, leaf retention & flower coverage



Monarda x 'Judith's Fancy Fuchsia'



Monarda punctata
Spotted Beebalm

Highly ranked (4.1 & 4.0)
Abundant, long-lasting flowers
Excellent resistance to powdery mildew

Monarda

For the Mid-Atlantic Region

George Coombs, Research Horticulturist

Wild Bergamot (*Monarda fistulosa*)



Species:
Powdery mildew resistance very poor

Naturally occurring cultivar:
Sturdy, upright habit, good
resistance to powdery mildew

2016 Citizen Science Project on Visitation



'Claire Grace' top compared to hybrids
(species not tested)



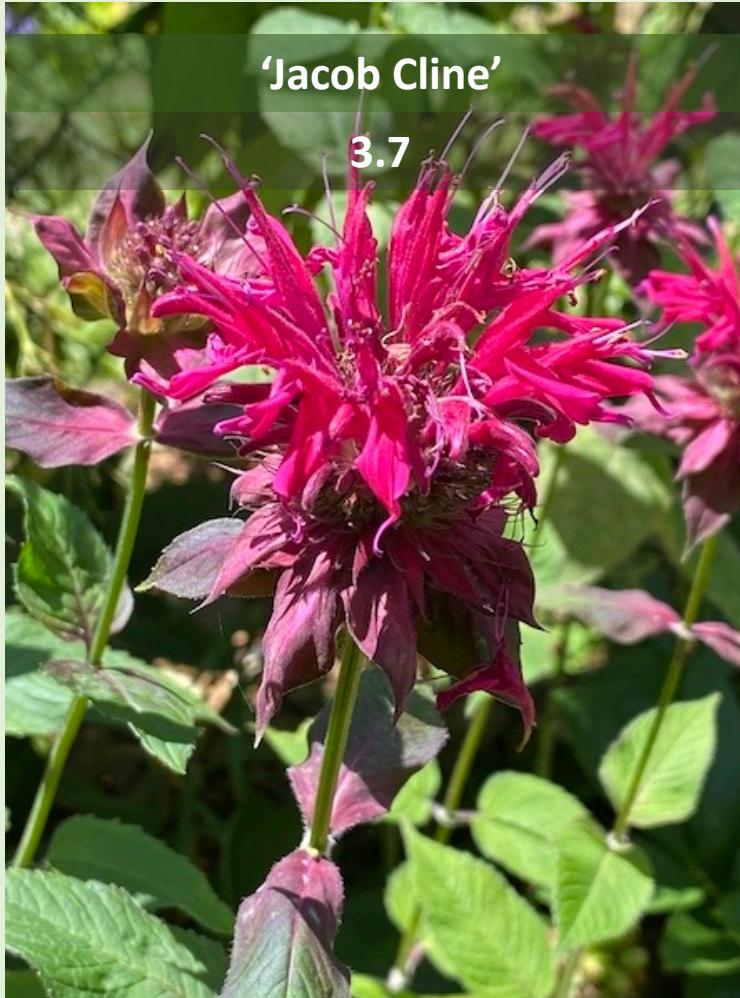
Species top in Penn State trials
& Annie White trials

Scarlet Beebalm (*Monarda didyma*)



Species

1.7



'Jacob Cline'

3.7

Species:
Low flower coverage
Powdery mildew resistance poor

Naturally occurring cultivar:
Vigorous, abundant flowers
Fair resistance to powdery mildew

2016 Citizen Science Project on Visitation

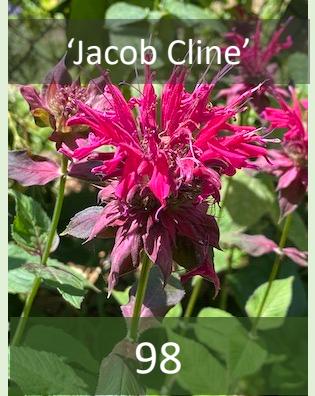
Hummingbird

1. <i>M. didyma 'Jacob Cline'</i>	(273)
2. <i>M. 'Gardenview Scarlet'</i>	(39)
3. <i>M. 'Cambridge Scarlet'</i>	(31)
4. <i>M. didyma</i>	(22)
5. <i>M. 'Raspberry Wine'</i>	(22)

'Jacob Cline' significantly higher than hybrids and species



93



98

Species close in Penn State trials

Phlox for Sun

- Grew 94 hybrids or selections of sun-loving native species (2015-2017)
 - 66 of *Phlox paniculata* (Garden Phlox)
- Trial focus on flowers, foliage quality, habit, powdery mildew resistance
- 'Jeana' ranked top (4.8) among *Phlox paniculata* cultivars
- Also conducted an evaluation of butterfly preference



- Monitored butterfly visitation 2016-2017
- Hour-long shifts by Pollinator Watch volunteers
- *Phlox paniculata* 'Jeana' overwhelmingly preferred
- U of DE graduate student: No correlation between visitation and quantity or sugar content of nectar
- Shallowness of flower tube may allow butterflies quick access to many flowers



Best Phlox for Butterflies	
(539)	1. <i>P. paniculata</i> 'Jeana' *
(117)	2. <i>P. paniculata</i> 'Lavelle' *
(116)	3. <i>P. paniculata</i> 'John Fanick'
(105)	4. <i>P. × arrendersii</i> 'Babyface' *
(71)	5. <i>P. paniculata</i> 'Speed Limit 45'
(61)	6. <i>P. paniculata</i> 'Dick Weaver' *
(60)	7. <i>P. paniculata</i> 'Blushing Shortwood'
(58)	8. <i>P. paniculata</i> 'Tracy's Treasure'
(56)	9. <i>P. paniculata</i> 'Thai Pink Jade'
(55)	10. <i>P. paniculata</i> 'David's Lavender'
(50)	11. <i>P. paniculata</i> 'Robert Poore' *
(48)	12. <i>P. paniculata</i> 'LSS Vincent'
(45)	13. <i>P. paniculata</i> 'Shortwood' *
(43)	14. <i>P. paniculata</i> 'Party Punch'
(43)	15. <i>P. paniculata</i> 'Delta Snow' *

* = Top horticultural performers

Phlox for Shade

- Grew 43 selections of two native shade-loving species
 - *Phlox divaricata* (Woodland Phlox)
 - *Phlox stolonifera* (Creeping Phlox)
- Trial focus on habit, vigor, and floral display
- Creeping Phlox easier to grow
- Powdery mildew a significant problem with Woodland Phlox (defoliation)
- No data on use by wildlife



Phlox
For the Mid-Atlantic Region
George Coombs | Manager, Horticultural Research

Helenium

- Grew 44 taxa, including species, cultivars & hybrids (2017-2019):
 - *Helenium autumnale* (Helen's Flower)
 - *Helenium flexuosum* (S. Sneezeweed)
- Native to Americas but most breeding in Germany & Netherlands
- Origin of hybrids & cultivars unclear
- 'Can Can' cultivar of *H. autumnale* rated just above species (4.1 & 3.9)
- Species of *H. flexuosum* rated 4.0



'Can Can'

H. flexuosum

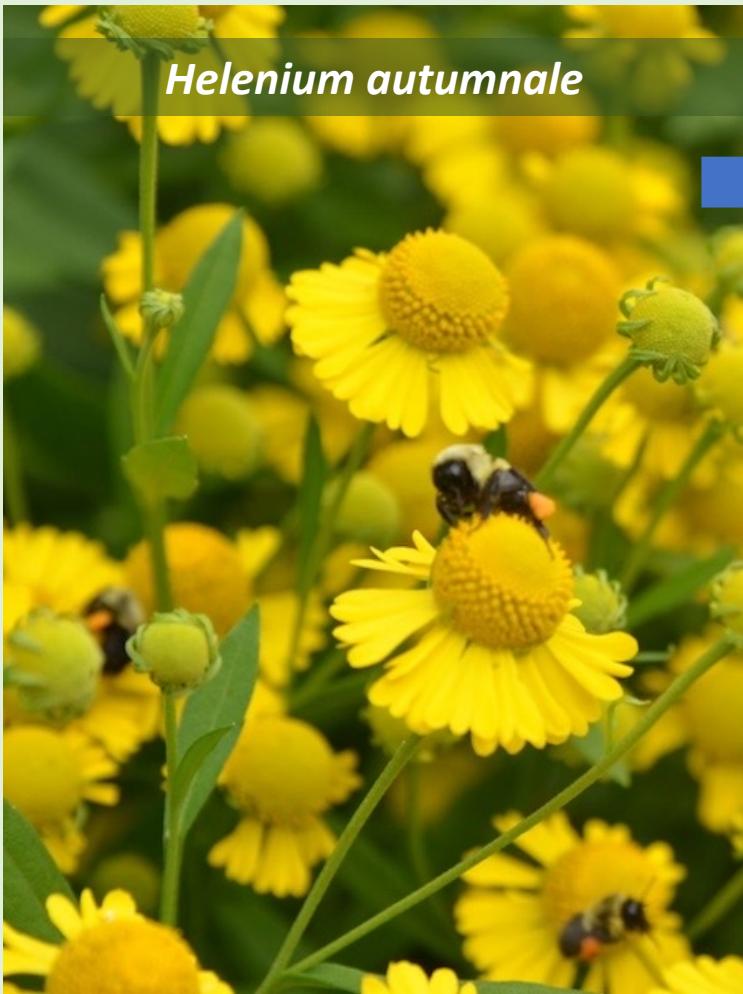
Floriferous
Disease-resistant

Profuse flowering
Less need for staking

Helenium

For the Mid-Atlantic Region

Sam Hoadley, Manager of Horticultural Research
George Coombs, Director of Horticulture



Visitation Statistics

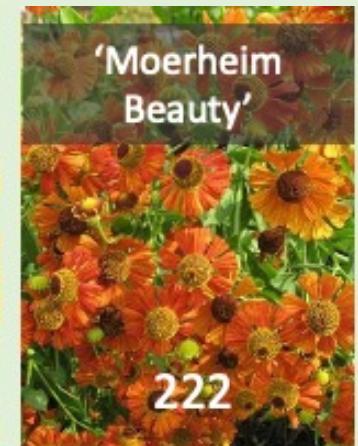
Best *Helenium* for Bees & Wasps

(162)	1. <i>H. autumnale</i> *
(151)	2. <i>H. 'Zimbelstern'</i> *
(129)	3. <i>H. 'Kanaria'</i> *
(128)	4. <i>H. autumnale</i> 'Can Can' *
(127)	5. <i>H. 'Tijuana Brass'</i> *
(117)	6. <i>H. 'Kugelsonne'</i> *
(111)	7. <i>H. 'Flammenspiel'</i> *
(104)	8. <i>H. 'El Dorado'</i>
(101)	9. <i>H. 'Potter's Wheel'</i> *
(90)	10. <i>H. 'Sahin's Early Flowerer'</i>
(87)	11. <i>H. 'Kupfersprudel'</i>
(85)	12. <i>H. 'Waltraut'</i>
(85)	13. <i>H. flexuosum</i> (DE ecotype) *
(83)	14. <i>H. 'Helbro'</i> (Mardi Gras)
(80)	15. <i>H. 'Ranchera'</i>

Observed for 1 minute, twice weekly
during growing seasons, 2017 & 2018



In Top 10 for insect diversity &
Top 20 for total visits
in Penn State trial



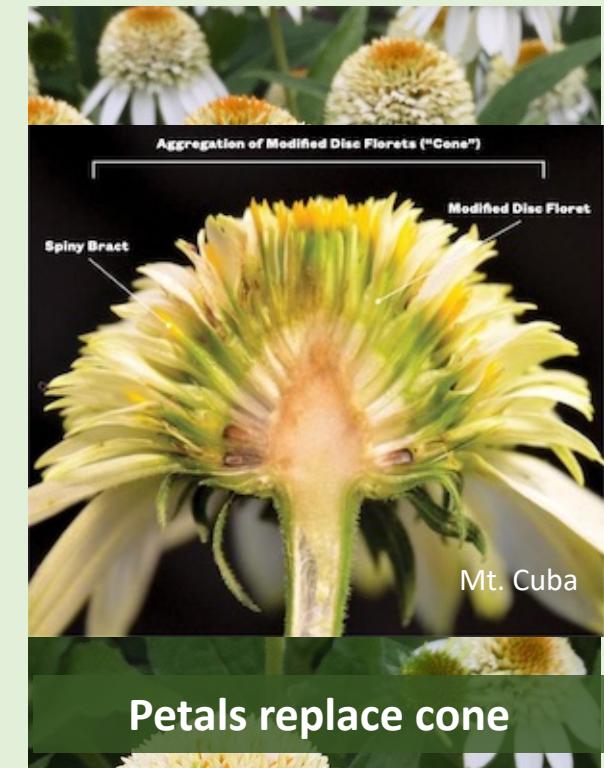
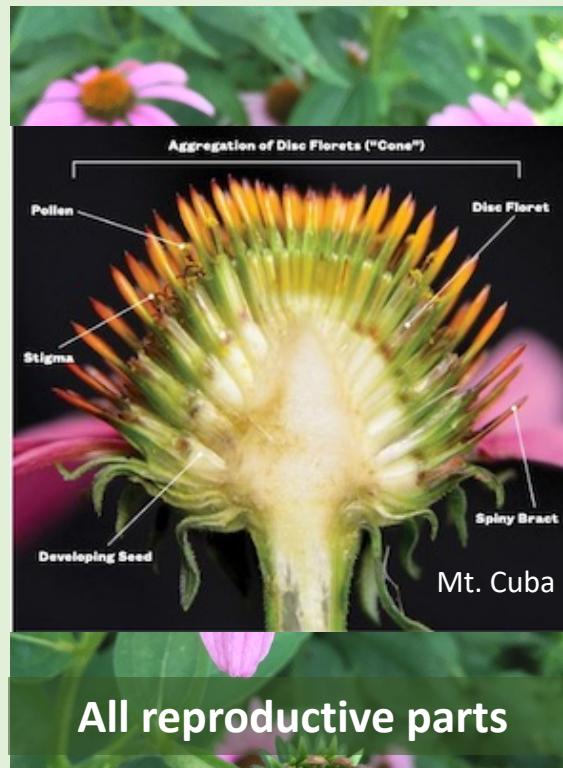
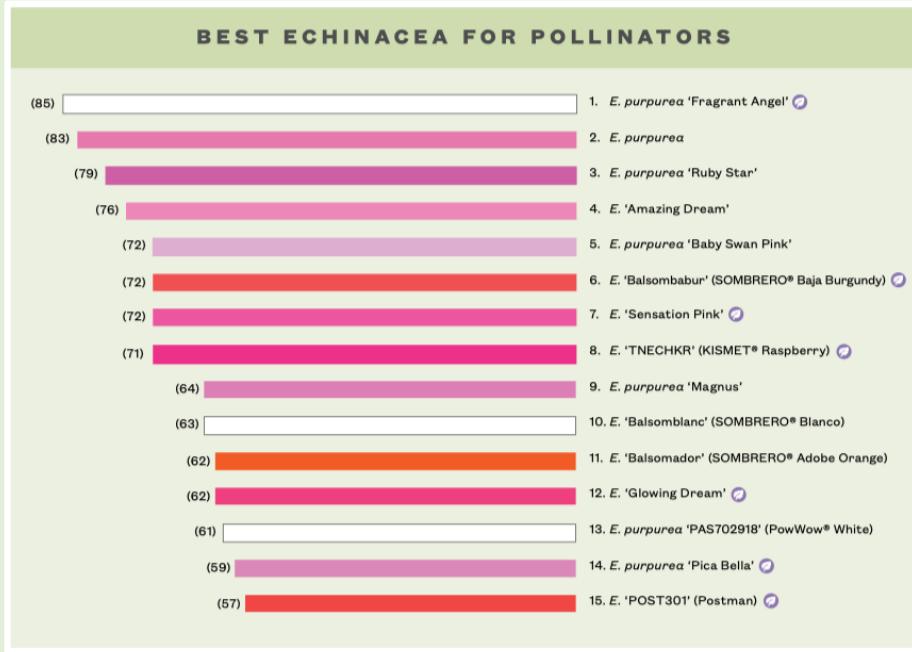
Helenium autumnale
Helen's Flower

Topped hybrid in Annie White trial

Echinacea

- *Echinacea purpurea* extremely popular & origin of many cultivars
- Repeat of earlier 2007-2009 trial with focus on evaluating new cultivars
- Grew 75 species, cultivars & hybrids (2018-2020)
- 5 species native to TN and Midwest
- Some plants short-lived due to infection rates of aster yellows
- Added component of pollinator study





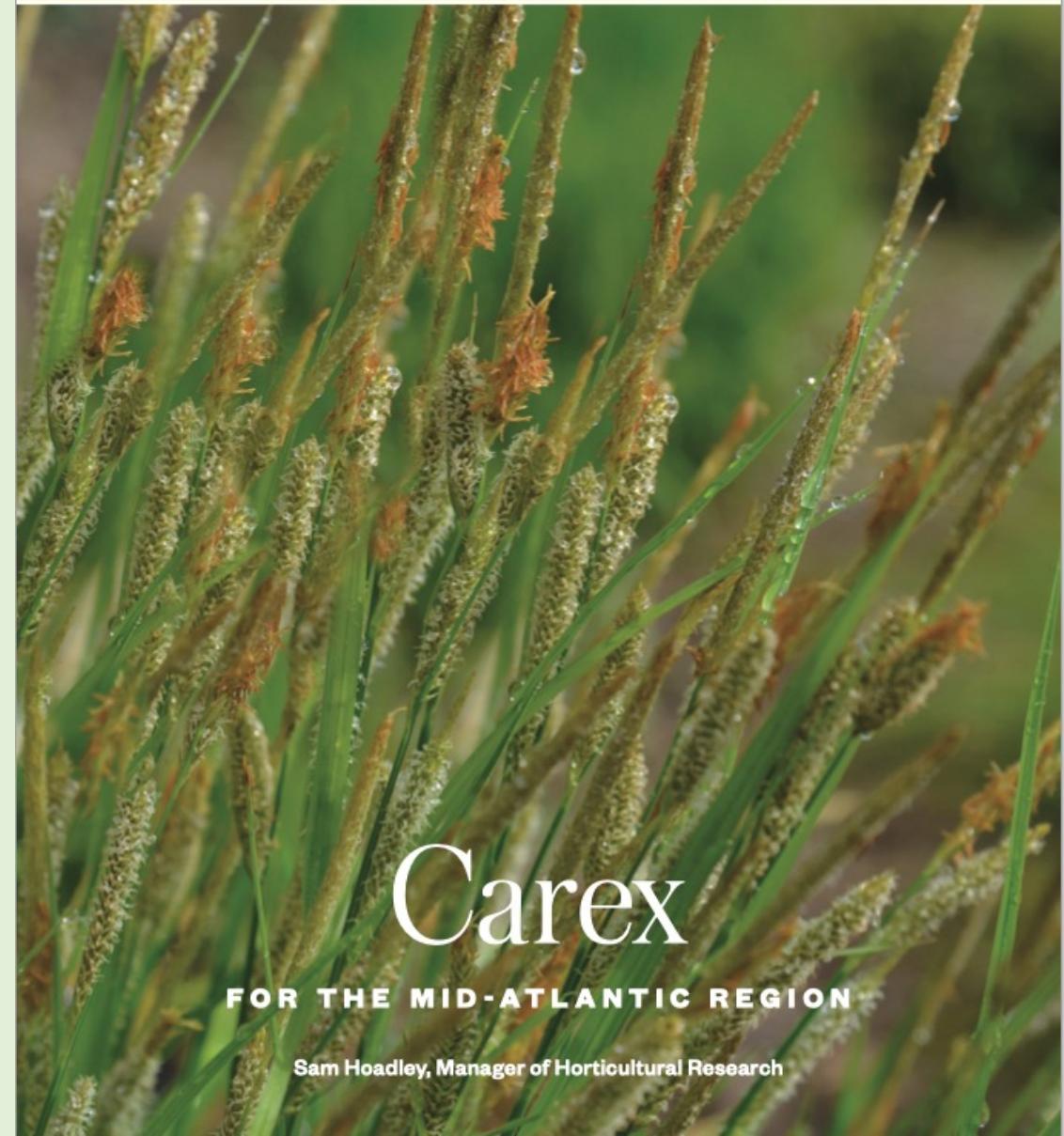
Majority bees & wasps, some butterflies



All lower photos Mt. Cuba

Carex

- Grew 65 species & 5 cultivars of native sedges (2018-2022)
- Wind-pollinated, but offer seeds & cover and serve as larval host plants
- Growing popularity as ground covers or as specimens & accents
- Evaluation of horticultural qualities, vigor, and adaptability (sun & shade)
- Final year: response to biweekly mowing to assess potential as lawn substitutes



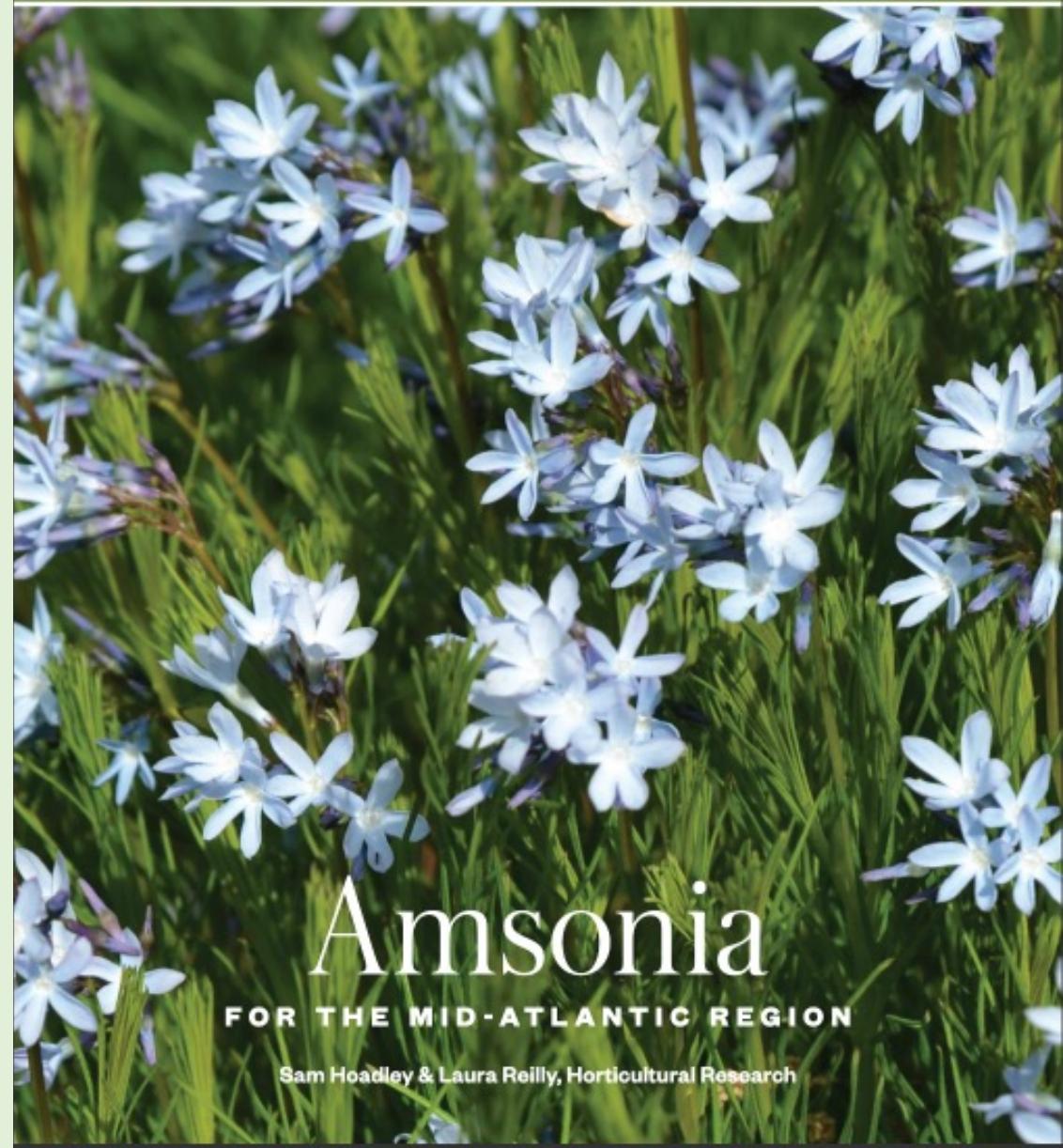
Carex

FOR THE MID-ATLANTIC REGION

Sam Hoadley, Manager of Horticultural Research

Amsonia

- Rated 20 taxa, including species (some native to Southeast), cultivars, and hybrids (2013-2023)
- Evaluated for habit, vigor, and floral display
- Observations of pollinator interaction April to June 2023
- Diversity of pollinators (butterflies, native bees, and hummingbirds), but low total numbers
- Host plant to Snowberry Clearwing



Amsonia
FOR THE MID-ATLANTIC REGION

Sam Hoadley & Laura Reilly, Horticultural Research

OSU Garden Ecology Lab Study

- Doctoral work of Jen Hayes
- Field trials 2020-2022 to compare West Coast native species & cultivars
- Data collected on pollination visits & diversity
- Nectar samples to be analyzed for sugar content and volume
- Nutrient composition of pollen samples to be analyzed for effect on adult bees & developing larvae



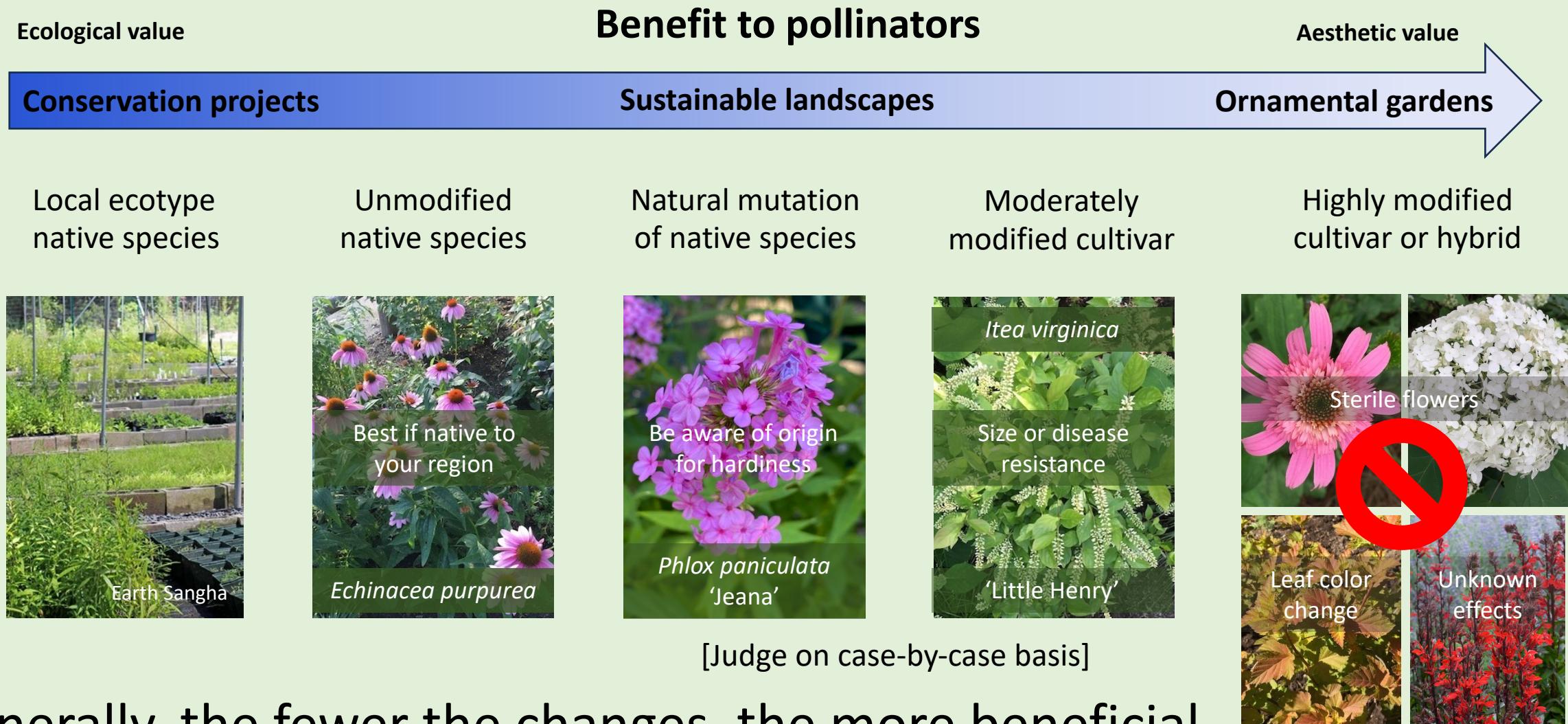
OSU study

- Using multispectral photography for analysis of UV markers
- Changes in fluorescence among cultivars may confuse pollinators



Recommendations & Resources

Spectrum of choices (based on gardener priorities)



Determining appropriate native plants

Itea virginica Virginia Sweetspire, Virginia-willow

Fragrant, showy four-inch spires of white blossoms fall from arching stems in late spring. In autumn, the leaves of Virginia Sweetspire turn a vibrant red to orange. This native* favorite has graceful open growth habit and performs best in partial shade with moist soil.

Tried and True
native Plant Selections
for the Mid-Atlantic
MGNV
Master Gardeners of Northern Virginia
Arlington + Alexandria + mgnv.org

Shrub
Height: 6-10 feet
Spread: 4-6 feet
Bloom Color: White
Characteristics
Upright, arching to rounded deciduous shrub
Oval, lustrous dark green leaves, 1-4 inches long persist well into winter
Tiny white flowers in cylindrical, drooping clusters cover the shrub May to June
Fruit appears in June as green capsules turning to brown and persists into March
Flaming fall color: orange, crimson, burgundy
Suckers to form thickets
Attributes
Tolerates clay soil, wet soil, dense shade, and flooding to 6 inches; no serious pests or diseases; deer occasionally severely damage when favorite food sources are gone
Green or red twigs provide winter interest
Attracts bees, butterflies, wasps, and birds; provides nesting habitat and cover for birds
Growing and Maintenance Tips
Excellent Replacement for
Soil Requirements: Humus-rich soil
Berberis thunbergii - Japanese Barberry
Light Requirements: Sun, Partial Shade
Daphne odora - Winter Daphne
Water Requirements: Moist, Wet
Euonymus alatus - Burning Bush
More prolific flowers/colorful foliage w/ more sun
Spiraea japonica - Japanese Spirea
Use in rain or woodland gardens, at fresh water's edge, naturalized, or to control erosion
Syringa vulgaris - Lilac
*It is native to DC and to NoVA (except for Loudoun County) although it is rare in the outer Piedmont. It is common in the Coastal Plains of DE and VA. It is extirpated in PA.
Hardiness: USDA Zones 5-9

developed by Master Gardeners of Northern Virginia, serving Arlington and Alexandria

Images by Mary Free, Quarry Shade Garden and by Elaine Mills (bottom), private garden, Arlington, VA



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Digital Atlas of the Virginia Flora

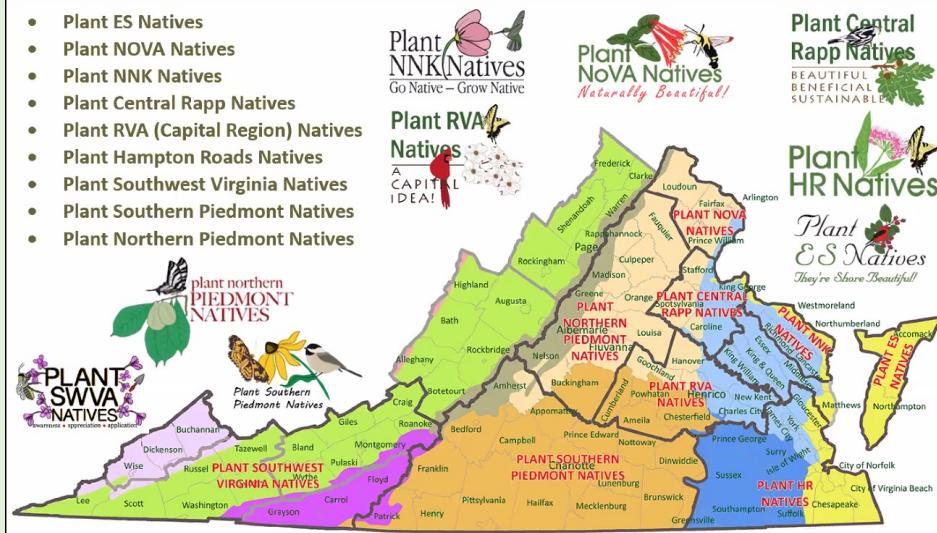
News & Announcements Group Family Genus County Excluded Taxa About Earlier Editions Contribute New Records

Home

Welcome to the Digital Atlas of the Virginia Flora. To search or browse through the Atlas, use the green menu above, or click on a link below.



- Plant ES Natives
- Plant NOVA Natives
- Plant NNK Natives
- Plant Central Rapp Natives
- Plant RVA (Capital Region) Natives
- Plant Hampton Roads Natives
- Plant Southwest Virginia Natives
- Plant Southern Piedmont Natives
- Plant Northern Piedmont Natives



Virginia Native Plant Society
Conserving Wild Flowers and Wild Places

About Membership Chapters Natives Events Conservation Blog Resources Store

In the Spring, 2024 *Sempervirens*

The 2024 Wildflower of the Year: White Turtlehead and its relationship with Bumblebees, results from our 2023 Natural Area Preserves Fundraiser, our Statement on Utility-Scale Solar, Virginia's 2024 legislative session, a visit to South Africa, and more! Read the latest *Sempervirens* online and also browse previous editions.

[Read Now](#)



News & Updates

- Our 2024 Wildflower of the Year T-Shirt Design Contest has ended.

[View the winners, voted on by VNPS members.](#) The 1st place design by Nick Garnhart is featured on apparel and merchandise at our [VNPS Bonfire.com Store](#). 4-4-2024

- Please join us in preserving Jocelyn Sladen's legacy and in celebrating her life as a conservationist and a founder of VNPS. [Donate now](#) to help us save Torrey's Mountain Mint. 4-4-2024

- The 2024 VNPS Wildflower of the Year is White Turtlehead. [Read more about *Chelone glabra*](#), including its conservation status and where to see it. 3-1-2024

- Don't miss the [Winter, 2024 Sempervirens](#). News from our 2023



Buying native plants

Plant NOVA Natives
Naturally Beautiful!

Promoting native plants in Northern Virginia

Español | Français | Deutsch | 中文 | عربي | 日本語 | ملارسني | Tiếng Việt

Home Start here! Get plants/help Habitat gardening Landscaping solu...

Native-only sellers

These native plant sources make it easy to find and purchase native plants for your home and garden without the risk of purchasing a non-native or invasive species.

Natives Sold Exclusively

Northern Virginia

- Nature by Design*** A local native plant nursery in Alexandria, Virginia. Same day browsing appointment are always available, or shop by curbside pickup. <http://www.nature-by-design.com/>
- Watermark Woods*** A local native plant nursery in Hamilton, Virginia. Curbside pickup available. They also sell [seeds here](#). www.watermarkwoods.com
- Virginia Native Plant Society*** Virginia Native Plant Society Potowmack Chapter: First Wednesday of each month, 10 am to 1 pm, April through October. Native plants sold in the VNPS propagation beds at Green Spring Gardens Park, behind the horticulture center. No credit cards - cash and checks only.
- Earth Sangha*** is a nonprofit that propagates wild plants for ecological restoration. Curbside pickup, 1-on-1 appointments or "Self-Service Saturdays." <http://www.earthsangha.org>

A little further afield

- Hill House Farm and Nursery*** Native Plants for Harmonious Gardens Castleton, VA Curbside pickup and delivery available. www.hillhousenativeplants.com
- Chesapeake Natives** offers online sales; see their website for on-site plant sales information in Upper Marlboro, MD. <http://chesapeakenatives.org/>
- Tree Talk Natives** in Clarksburg, MD. <https://www.treetalknatives.com/>
- Wildflower Native Plant Nursery** - Bethesda, MD. open by appointment. www.wildflowernativeplants.com/

* Neonicotinoid-free, per vendor. Note that the Plant NOVA Natives campaign does not verify vendor pesticide use. Click for info on ['Neonics'](#).

Native seed sources

2022 Local Native Plant Sales

Check here for one in your area!

Virginia Native Plant Society
Conserving Wild Flowers and Wild Places

About Membership Chapters Natives Events Conservation Blog Resources

Native Plant Nurseries

Listing Policy:

• The nursery sells primarily native plants and does not sell invasive species as defined in the [Virginia Invasive Plant Species List](#) published by the Virginia Department of Conservation and Recreation Natural Heritage Program.

• Plants are propagated from nursery stock or responsibly collected seeds and not removed from the wild to sell.

VNPS does not endorse or recommend any individual nursery and is not responsible for the accuracy of claims made by those organizations included in this listing. Please report any infractions to this policy.

To submit a nursery or plant sale to the list, or to provide updates or corrections, please contact the VNPS office at vnps.org@gmail.com or (540) 837-1600.

Download the Native Plant Nursery List as an [Excel File \(.xlsx\)](#) or as a [CSV File \(.csv\)](#)

[View Most Recent Updates](#)

Search Nurseries:

Name	City	Phone	Website
ArcheWild Native Nurseries	Quakertown, PA	(855) 752-6862	archewild.com
Botanique	Stanardsville, VA	(434) 985-3060	pitcherplant.com
Bromo Trees	Bromo Bluff, VA	(434) 842-8733	bromotrees.com
Davis Natives	Ashland, VA	(804) 347-8495	davinsnatives.com
Draper Springs Nursery & Gardens	Draper, VA	(540) 251-4349	drapersprings.com
Earth Sangha Wild Plant Nursery	Springfield, VA	(703) 333-3022	earthsangha.org
Farfields Farm	Afton, VA	(434) 326-2157	farfieldsfarm.com
Good Seed Natives	Richmond, Virginia	(804) 396-4278	goodseednatives.com

Maryland Native Plant Society
APPRECIATION • CONSERVATION • EDUCATION

HOME EVENTS NATIVE GARDENING PLANT ID RESEARCH GRANTS PUBLICATIONS

BUYING NATIVE PLANTS

- Check out upcoming [Native Plant Sales](#)
- More information about [Gardens and Natives](#)
- **Is it native to Maryland?** Search for the plant in the Maryland Plant Atlas. This is the most up-to-date information on Maryland nativity.
- [How to Shop for Native Plants](#) (PDF, ~83 KB)
- [The MNPS Shoppers Protest Card](#)

NATIVE PLANT SALES

Baltimore Native Plant Sale
04/15/2023 9:00 AM
Church of the Redeemer, Baltimore

Native Plant Sale: Loudoun County, VA
04/22/2023 9:00 AM
Morven Park, Leesburg VA

Native Plant Sale: Howard County
05/07/2023 12:00 PM
Robinson Nature Center, Columbia

REGIONAL NATIVE PLANT VENDORS

MNPS provides this list solely for the convenience of those who wish to purchase native plants. It is based primarily on information received from the vendors, and therefore is not intended as an endorsement or recommendation of any of the vendors listed. Some vendors sell non-native plants in addition to native plants. Please contact the vendors for additional information about their products.

* Vendors marked with an asterisk are members of the Maryland Native Plant Society.

If you are a vendor who wishes to be listed or if your information has changed, please send an email to nurserylist@MDFlora.org.

Adkins Arboretum*
12610 Evlardon Road
Ridgely, MD 21660
Phone: (410) 634-2847
Non-profit
Website: www.adkinsarboretum.org
E-mail: nativeplants@adkinsarboretum.org
Call or see the website for spring open house dates (end of April), regular nursery hours, and special sales.

MNPS Native Plant Nursery Map
pru foster
This map was made with Google My Maps. Create your own.





QUESTIONS?

