



Turning a New Leaf Conference
Shepherdstown, West Virginia
November 16, 2013

Track C: Flora and Fauna: Applying Ecology to Design

Session C.3 Top Plant Picks for Pollinators. Constance Schmotzer, Extension Educator, Penn State Cooperative Extension, York County, Pennsylvania

Pollinators are so important and we are losing them – why?

- Pesticides – 122 different pesticides found in honeybee samples
- Diseases and parasites
- Lack of nesting habitat
- Lack of floral resources

Pollination goes beyond European honeybees. 400 bee species are native to the Mid-Atlantic region; e.g., solitary bees. Other pollinators: flies and beetles, e.g. syrphid fly .

Butterflies and moths also pollinators though not as effective as bees. Easier to market plants for butterflies than bees; if you plant for butterflies, bees will come. Hummingbird also a pollinator.

All nectar plants are not equal. Native plants are 4 times more attractive to pollinators than non-native plants. Some cultivars/hybrids may lack nectar and/or pollen.

Pollinator plant trials are being conducted at Penn State Southeast Agricultural Research and Extension Center. Eighty-four species/cultivars of native plants known to attract pollinators are being trialed. Each plant has 3 5x5 plots, densely planted to reduce weeding

They will evaluate each plant for establishment, growing and blooming characteristics, aesthetic appeal. Determine insect visitation to each plant (observation and collection). Goal: Identify best plants to attract pollinators (growers/farmers; residential)

Aug 29, 2011 Master Gardeners gathered to plant 4500 plugs from New Moon and North Creek nurseries

Sept 7 – Tropical storm Lee, plot was flooded for 3 days. Plants were covered with mud when water subsided. May 2012, plants were grown – lost one plant, *Lobelia cardinalis* 'Fried green tomatoes'. All other 83 species survived.

Staff and MGs monitor all blooming plants weekly. Something always in bloom, April through late October. In spring will be making note of which plants have seeded into other areas.



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Results – some caveats

- High concentration of many plant species in small area – was plant that wasn't visited really not preferred, or was there a better-preferred one adjacent?
- Seasonal variation – plants blooming mid-summer had more visitors but there are more insects present at that time
- Some plants had trouble establishing under their conditions; e.g., *Asclepias tuberosa* (butterfly milkweed), which loves good drainage. It survived enough for some observations, but if individuals had all survived, it would have been higher-scoring plant.

Preliminary results presented for the 'Top Plant Picks' -- best plants for attracting pollinators and for attracting beneficial insects, including cultivars. Culture and descriptive information was also provided for each plant. Noted that plants with large compound inflorescences of tiny flowers attracted significantly more types of insect categories than other flower types.

TOP PICKS FOR POLLINATORS

- *Pycnanthemum muticum* (clustered mountain mint) was top plant pick for pollinator plants, attracting both most diversity of pollinators and sheer numbers of insects.
- *Eupatoriadelphus dubius* (coastal plain joe pye) was 2nd in attracting insect diversity, 3rd in sheer numbers. First in attracting butterflies: 17 diff butterfly species.
- *Coreopsis rosea* (pink tickseed) was 3rd for number of bee and syrphid fly visitors, tiny insects.
- *Monarda punctata* (spotted horsemint) – of all *Monarda*, attracted most bumblebees this year -- bloomed through September.

BENEFICIAL INSECTS - PREDATORS OF DAMAGING INSECTS

Plants that attract pollinators also attract beneficial insects – including predators and parasites of brown marmorated stinkbug (BMSB).

- *Bicyrtes quadrifasciatus* (sand wasp) provision their nests with BMSB nymphs. Study found 96 collected by one wasp. They require a bare patch of sandy soil to create a sand mound for their nest. They were most attracted to *Pycnanthemum muticum* (clustered mountain mint).
- *Astata unicolor* wasp is predator of stinkbug nymphs. Prefers *Eupatorium hyssopifolium* (hyssop-leaved thoroughwort) and *Monarda fistulosa* (wild bergamot).
- *Trichopoda pennipes* (tachinid fly) lays eggs on squash bugs and stink bugs. Attracted to *Pycnanthemum muticum*, *Eupatorium hyssopifolium*, *Eupatorium perfoliatum* (boneset), *Asclepias tuberosa* (butterfly milkweed).
- *Gymnosoma* sp. (tachinid fly) is parasite of stink bug, attracted to *Eupatorium perfoliatum* and *Solidago* (goldenrod) species.



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COMPARING CULTIVARS

- *Monarda didyma* (bee balm), straight species had 2nd highest insect count. Cultivar 'Jacob Cline' had lowest insect count. *Monarda* x 'Peter's fancy fuschia' had highest insect count.
- *Monarda fistulosa* (wild bergamot) – straight species was vigorous, attracted bumblebees. Cultivar 'Claire Grace' nice-looking but did not attract as many as straight species.
- *Symphotrichum novae-angliae* (New England aster) straight species attracted eight species of bumblebees. 'Purple dome' is popular cultivar that stays short and is gorgeous first year. It attracted fewest pollinators of any plant in the trial. Would it do better if other resources were not available? Unknown as it didn't come back second year.

CONCLUSION

It's about nectar and pollen, in the relationships of insects to plants. Noted that there is also a massive seed bedding plant trial -- significant lack of pollinators on that trial vs pollinator trial plot. Key is diversity – almost all plants in the trial were winners. Again, noted that the plants were supplied by New Moon Nursery and North Creek Nursery.

WHAT'S NEXT

- Continue monitoring in 2014 and 2015
- Monitor for endangered bumblebees in partnership with Xerces Society
- Plant and monitor more cultivars
- Publish factsheets for growers and home gardeners
- Publish pollinator plant phenology chart that has been prepared
- Last Saturday of July, *Summer Garden Experience*, an open house will be held where visitors can see the pollinator plots and buy plugs of plants. Plots are always open for visitors.
- "Bees, Bugs, Blooms: A research trial of pollinator attracting plants"

Q&A

Q. How can we get a copy of the phenology chart?

A. Will provide for CCLC web site (see handout on proceedings page)

Q. Will there be some research on which plants can survive predation by rabbits and deer?

A. Deer don't seem to go in the plots though it is somewhat accessible to them

Q. Are they connected to other pollinator studies?

A. Just within Penn State, Dr. Bittinger, Xerces Society and NRCS on fruit trees.

Q. Have you compared same species from the two growers?



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A. No.

Q. Challenge to find nurseries to collect seed, be depository for seed, figure out which plants are best for growing, how to get plants into the trade. Has Penn State been doing that?

A. Not yet. Would love to share information with others who are doing it.

Q. Can you share list of all the plants in the trial?

A. Will share post-conference (see handout on Proceedings page) list of plants in trial but doesn't have data behind all the plants.

Q. Was any *Rudbeckia* in the trial?

A. No. Didn't expect it to be a pollinator plant but learning it has other great characteristics.

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