Gardening Underwater

Last month, I found a different and fascinating world of gardening. In early April, husband Gary and I attended the Aquatic Gardeners Association (AGA) conference in Reston, Virginia. Gary is immersed (pun intended) in the subject of planted aquariums, otherwise known as aquatic gardens. Aquatic gardening hobbyists and professionals use aquatic plants and “hardscape” (rocks, stones, and driftwood) in order to make aesthetically pleasing aquatic environments— in effect, gardening underwater. For the planted aquarium enthusiast, fish provide a supporting role, or may not be present at all. The AGA conference included sessions on water plant plant taxonomy, substrate, aquascape lighting, and even a session on invasive weeds (duckweed!). A special session included an exciting timed competition in which two competing aquatic gardeners had two hours to assemble tanks with substrate, plants, rocks, and driftwood. The gardener whose aquascape had the best composition, balance, and selection of materials won the contest.
As with land-based gardens, several factors must be balanced in the closed aquarium tank system to ensure success as well as survival. These factors include water filtration, maintenance of carbon dioxide for underwater photosynthesis, use of plant substrate and fertilization, and use of efficient lighting. Aquascape designs include a number of distinct styles, including Dutch, the Japanese-inspired nature style, and the Paludarium (water and land combined within the same aquarium). These different styles, which where seen in different aquascapes at the AGA show, are shown below.

The Dutch aquascape was developed in the Netherlands starting in the 1930’s, when freshwater aquarium equipment first became commercially available. This aquascape style uses a lush arrangement of multiple plant types that have diverse leaf colors, sizes and textures. Many aquascapers still use this style today.

In the 1990’s, the Japanese introduced the “nature style” aquascape. This style draws on Japanese gardening techniques that attempt to mimic natural landscapes by the use of the asymmetrical arrangement of a few species of plants, along with carefully selected stones or driftwood. As can be seen in the picture below, this style uses a minimalist approach in which the number and types of stones, driftwood, plants and fish are limited.

A Paludarium is an aquarium that combines both water and land in one aquarium, with one part underwater and the rest above water. Substrate is built up so that some “land” regions are raised above the waterline, and the tank is only partially filled with water. Paludariums can represent tropical rainforests, jungles, riverbanks, bogs, even beaches. In this type of aquascape, plants and bromeliads can grow with their roots underwater and their tops in the air. Fish as well as amphibians can live here.
In looking at the aquascapes and attending the classes held at the AGA Conference, I found that underwater gardening is a fascinating world with many parallels to gardening on land. Interestingly enough, I found that I could understand the course content of many of the AGA classes, because my experience as a Master Gardener gave me a good background in areas including substrates, and lighting. I think that all Master Gardeners could understand many elements of aquascaping, because our classes and experiences give us a good background that can let us travel, with understanding, even to underwater gardens!

This story used Wikipedia/aquascaping for background material. For a more detailed exploration of aquascaping and some very interesting pictures, follow this link to the Aquatic Gardener Association http://www.aquatic-gardeners.org. To view pictures of previous AGA aquascape competition winners, visit http://showcase.aquatic-gardeners.org/

p.s. – Thanks to everyone for their volunteer hours. Our volunteer hours help others, and help us become better Master Gardeners!

Ellen Haas 2013

Our 4,000 native bee species in the United States fall into one of two categories – pollen generalists and pollen specialists. Generalist bees are the majority, accounting for 80% of all bee species. It is their good fortune to be able to forage on many different native plant species, and often on a number of non-native plants. The European Honey Bee (non-native, of course) is also a forage generalist.

For the other 20% of our native bees, it’s slim pickings for forage sources. Specialist bees rely upon just a handful of native plant species, with some bee species dependent upon a single plant species. Does it matter what you plant in your landscape? It certainly does to a specialist bee!

Specialist bees emerge from their nests when their specific forage plants begin to flower. The relationship is sometimes interdependent – the bee relying upon that particular plant species and the plant depending upon that specific bee species for pollination services. In other cases, the plant may attract many different bee species. While numerous bee species are in trouble, our specialist bees would seem to be at greatest risk.

Here’s a quick exercise – name 6 native plants in your landscape and the specialist native bees that use them. Can’t do it? Don’t feel too badly, you are not alone. Simply finding a list of the bees that are native to your state can be a challenge, much less a list of forage plants for specialists. Some plants that support specialist bees are less well known in average landscapes, such as Spring Beauty (Claytonia virginica), but other plants are more common, including native Sunflowers (Helianthus spp).

Kim Eierman

PLANTING FOR SPECIALIST NATIVE BEES

Figure 3
If you live in the Mid-Atlantic or the Northeast, you are in luck – there is a new research report listing many specialist bees and their host plants. “Specialist Bees of the Mid-Atlantic and Northeastern United States” was published by Jarrod Fowler of the Stockbridge School of Agriculture at the University of Massachusetts and Sam Droege of the USGS Patuxent Wildlife Research Center in Beltsville, Maryland.

The authors report on 95 species of specialist bees, with *Andrena* bees being the most numerous (40 in their study). *Andrena* bees are a big group – with approximately 1,400 species in North America. They are one of two genera of mining bees, the other being the *Perdita* genus (most commonly found in the Southwest). Mining bees nest in the soil – a clue to providing proper habitat for them in your landscape – leave patches of bare soil in full sun.

While the authors of the study admit that their research is not exhaustive (native bees have not been well studied, in general) their work is a tremendous resource for those of us who want to plant for pollinators, including helping the supremely challenged bees that are quickly running out of resources due to development and conventional planting practices.

You can make a difference this spring for both specialist bees as well as their generalists cousins. Those specialists just might need a little extra help.

For more information on our native bees, take a look at these helpful resources:

- “Specialist Bees of the Mid-Atlantic and Northeastern United States”
- “Bees in North America: The Whirlwind Tour”
- The Xerces Society
- UC Berkeley Urban Bee Lab
- Great Pollinator Project
- Pollinator Partnership
- *The Xerces Society Guide: Attracting Native Pollinators* by the Xerces Society
- *Pollinators of Native Plants* by Heather Holm
- *Bees, Wasps, and Ants* by Eric Grissell

Article copied from Kim Eierman at EcoBeneficial!

**USEFUL READ BEFORE PLANTING CORAL**

**Trial Research Evaluation on Coral Bells (*Heuchera*) at the Mt.Cuba Center in Delaware 2012-2014**

*Heuchera*, also known as coral bells or alumroot, are a favorite of gardeners everywhere. Their popularity is proven by the huge array of cultivars available today. The incredible amount of excitement surrounding *Heuchera* has led to an excessive amount of choices, as well as the occasional release of inferior or redundant plants before adequate trials could be performed. For these reasons, horticulturalists at the Mt. Cuba Center set out to evaluate 83 different cultivars derived from two species native to the eastern United States. Those species, *H.americana* and *H. villosa*, have lent hardiness,
vigor, and important color components to modern hybrids. Three years of evaluation data for each cultivar can be found at the link below. This link includes information about habit, vigor, bloom time, flower color, sun tolerance, pest and disease resistance, and overall adaptability.

### Description of the Evaluation Project

Mt. Cuba Center is located near Wilmington, DE, (USDA Hardiness Zone7A/6B). Five plants of each taxon were grown in a shade structure as part of a 15,000 sq. ft. trial garden. For the evaluation, the structure was furnished with a shade cloth that blocked 60% of the natural sunlight. One plant of each taxon was also grown in full sun for a period of two years in order to determine its tolerance to these conditions. The garden was protected from rodents by a 4’ tall wire fence, within a 100-acre garden protected by a 10’ tall deer exclusion fence. The clay-loam soil in the trial garden had an average pH of 6.5.

For the evaluation, the Trial Garden was maintained with the home gardener in mind. Plants were watered as needed during the first year in order to get them established. After that, they were left on their own. Pesticides were not used. Plants were cleaned up early each spring to remove winter-damaged foliage and again in August to remove faded leaves.

Each cultivar was measured weekly and assigned a rating based on a scale of 1-5, where (1 being very poor and 5 being excellent). The main attributes contributing to the overall rating were habit uniformity and foliage density. No regard was given to the actual color of the foliage in order to provide unbiased performance data. Weekly ratings reflected the way the living plants looked that week. Plant losses were factored in at the end of the trial by deducting points for deaths of two or more plants (2-3 deaths lost 0.25, 4-5 deaths lost 0.5). Deaths of only one plant did not result in a deduction. Floral display was evaluated on a scale of 1, 3, or 5 (insignificant, attractive, or outstanding). Year 3 data shows the final category most appropriate for a cultivar’s floral display over the three-year period. Sun tolerance was scored using a 1-5 scale based on the amount of bleaching and burning observed over a period of two years. This was then translated into a recommendation for the maximum amount of hours of direct sunlight that would prevent any disfigurement. That recommendation can be found under Year 3 data.

### Results of the Evaluation Project

At the link shown below, you will see data and results collected for 83 cultivars of *Heuchera*. The data and comments under Year 3 represent an overall summary of a cultivar’s performance throughout the trial as well as its final rating. At the link below, you will see summaries for the top ten *Heuchera* from our trial. You may look up a specific plant by scrolling through the alphabetical list of botanical names on the left side of the page, or browse by name and picture on the right side of the page. Please see Heuchera for the Mid-Atlantic Region at the link, for a more concise report about the best cultivars for the mid-Atlantic. The link will also give you information about other important topics like floral display, sun tolerance, foliage color transition, diseases, and garden culture.

At the link below you, will find the ratings and data listed under the menu tab “Year 3.” Here you can find the final, averaged rating as well as an overall summary of its performance throughout the trial.

Link: 
http://www.mtcubacenter.org/plant-trials/category/heuchera-evaluation-2012-2014/

### EDUCATION OPPORTUNITIES

#### Food Preservation Classes-Harford County 2015

<table>
<thead>
<tr>
<th>Month</th>
<th>Produce</th>
<th>Recipe</th>
<th>Resource</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>May</td>
<td>Strawberries</td>
<td>Jam</td>
<td>So Easy to Preserve pg 212</td>
<td>May 28 ~~ 12-3pm</td>
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<tr>
<td>June</td>
<td>Corn</td>
<td>Relish</td>
<td>So Easy to Preserve pg 154</td>
<td>June 18 ~~ 12-3pm</td>
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<tr>
<td>July</td>
<td>Cucumbers</td>
<td>Reduced sodium sliced dill</td>
<td>USDA Home Canning Guide 6 pg 34</td>
<td>July 7~~ 12-3pm</td>
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<tr>
<td>August</td>
<td>Peaches</td>
<td>Salsa</td>
<td>So Easy to Preserve pg 74</td>
<td>Aug 20~~ 12-3pm</td>
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<tr>
<td>Sept</td>
<td>Tomatoes</td>
<td>Hot Pack halves/whole</td>
<td>So Easy to Preserve pg 52</td>
<td>Sept. 17~~ 12-4pm</td>
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<tr>
<td>Oct</td>
<td>Pumpkin/winter squash</td>
<td>Cubed</td>
<td>So Easy to Preserve pg 87</td>
<td>Oct. 22~~ 12-4pm</td>
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<tr>
<td>Nov</td>
<td>Apples</td>
<td>Butter</td>
<td>Balls Blue Book 5th ed.</td>
<td>Nov. 6~~ 12-3pm</td>
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</table>

Call the Harford County Extension Office to register. Fee: $35 and $20 for additional classes.
Spring Advanced Trainings-2015
MD State Master Gardeners

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Location</th>
<th>Date &amp; Time</th>
<th>Presenter</th>
<th>Fee &amp; Registration Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wild Native Beans and Peas</td>
<td>Shad Landing State Park (Snow Hill)</td>
<td>Wed., May 6 12:30 - 4 pm</td>
<td>Sara Tangren</td>
<td>$25 April 29</td>
</tr>
<tr>
<td>Wild Native Beans and Peas</td>
<td>UME Anne Arundel Co. (Gambrills)</td>
<td>Fri., May 8 12:30 - 4 pm</td>
<td>Sara Tangren</td>
<td>$25 May 1</td>
</tr>
<tr>
<td>Ornamental Plant Diseases</td>
<td>College of Southern Maryland (LaPlata)</td>
<td>Wed., May 27 10 am – 3 pm</td>
<td>Dave Clement, PhD</td>
<td>$35 May 20</td>
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</tbody>
</table>

To register please use the Eventbrite Link listed with each class at the state website. See the link listed below. You may pay securely with a credit card or you may pay with a check. To pay by check please click on the “Show other Payment Options” link on the Eventbrite Registration Page (located under the Register icon). You will then receive further instruction to complete your payment.

http://www.extension.umd.edu/mg/advanced-training

DATES TO REMEMBER

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>May 7</td>
<td>MG Monthly Meeting &amp; Plant Swap; 10 am</td>
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<tr>
<td>May 7 (special event)</td>
<td>Guest speaker on Invasive Ecology by DNR 7 pm at HCEO</td>
</tr>
<tr>
<td>May 14</td>
<td>Larry Franz Woodland Walk and Tour @ Liriodendron; 5-7 pm</td>
</tr>
<tr>
<td>May 28</td>
<td>Planning Meeting 10 am</td>
</tr>
<tr>
<td>June 3 Wednesday CHANGE</td>
<td>Monthly Meeting &amp; Plant Swap; 7 pm</td>
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</tbody>
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Susquehanna State Park
Bluebells and Trilliums
The University of Maryland, College of Agriculture and Natural Resources programs are open to all and will not discriminate against anyone because of race, age, sex, color, sexual orientation, physical or mental disability, religion, ancestry or national origin, marital status, genetic information, political affiliation, or gender identity and expression.

THE MARYLAND MASTER GARDENER MISSION STATEMENT
The Maryland Master Gardener mission is to support the University of Maryland Extension by educating Maryland residents about safe, effective and sustainable horticultural practices that build healthy gardens, landscapes and communities

Extraordinary Root Exhibit at the United States Botanic Garden in Wash. DC

A few weeks ago I visited DC for the Cherry Blossom Festival. Better find was the unbelievable horticulture display at the Botanic Garden!

On display were living roots of prairie plants preserved in glycerin. A Kansas Agricultural ecologist studied the importance of healthy soils and their relationship to plants. Some of these root systems are at least 10’ long. You can see the biggest root system is ponytail- tied since it is too long for the display.

Joyce Browning