



# BONSAI NEWS

August 2017

## GREATER LOUISVILLE BONSAI SOCIETY

Ross Clark, editor

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### OFFICERS' CORNER

Many thanks to Bob and Sonya Williams and Tommy and Helen McCurry for hosting our July Garden Tour! Both bonsai collections were outstanding. The trees were so interesting and the wonderful ways they were displayed that it was difficult to leave. I just wanted to stay and enjoy the different varieties and workmanship of the bonsai. Thanks so much for all your hard work and hospitality!

GLBS will not have a general meeting in August.

We are having a **Board of Directors meeting on Wednesday, August 2 at 7pm at Bob Williams's home at 2204 Northfield Drive, Louisville.** Current members of the board are Dick Blayney, Chris Bowman, Steve Hammel, Linda Kossmann, Tom McCurry, Marion Taylor, and Bob Williams. Lee Squires, Mike Pfeffer and myself also are on the Board. **Please give this meeting priority; we have some very important items to discuss.** If you have some program ideas or would like to make suggestions regarding our schedule, please contact one of the Board members, so we can discuss it at the meeting.

### BOARD MEETING AGENDA ITEMS ALREADY SCHEDULED:

- Changes to constitution and by-laws
- Schedule of events and future meetings
- Nominating committee
- Next year's officers
- Charges for advertising in newsletter
- Per cent charge for sale of members' trees and pots

**Don't forget our Sept. 16th Saturday general membership meeting.** The program will be a demonstration. Cliff Pye has moved; you'll be notified by email as to who will be doing the program.

Sincerely,

*Earl Ekman*

President

**DISEASE ALERT! - see p. 5**



Black Hills spruce (*Picea alba* var. *densata*), displayed at MABA 2017.  
Photo by George Buehler.

## **2017 OFFICERS of the Greater Louisville Bonsai Society**

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### **Other board members:**

Dick Blayne, Chris Bowman, Steve Hammel, Linda Kossman, Tommy McCurry, Marian Taylor, Bob Williams

*The Editor thanks everyone who helps this newsletter succeed and welcomes ideas, suggestions and articles. Please address newsletter items to ross.clark@eku.edu. The deadline for the September 2017 issue of this newsletter is Friday, August 25.*

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## **2017 MEETINGS OF THE GREATER LOUISVILLE BONSAI SOCIETY**

*(all meetings in Louisville, Eastern time, unless otherwise indicated)*

**AUGUST** — no meeting scheduled. **Board of directors meeting, Aug. 2. See p. 1.**

**SEPTEMBER 16, Saturday.** **Cliff Pye program cancelled but new program is in the works. You'll be notified by email.**

**OCTOBER 19, Thursday, at Bon Air Library.** Building of **bonsai show stands.** Sharpen your tools!

**NOVEMBER 8, Wednesday, at Bon Air Library,** time tba. **Important business meeting.** We will vote on our revised constitution and by-laws and plan 2018 meetings and events.

**DECEMBER 2, Saturday,** time and place tba. Annual **holiday party.**

*Additional details will be published in this newsletter as they become available.*

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## **SOME 2017 SIGNIFICANT BONSAI EVENTS, EASTERN NORTH AMERICA (listed by date)**

*Additional events and details will be posted in this newsletter as details become available*

**Prairie State Bonsai Society (The Art of Bonsai) Show, Aug 5-6** (Sat. + Sun., 10 to 4), The Morton Arboretum, Lisle, IL. **Owen Reich** is the headliner; workshops include dwarf hinoki, very old English yew, shohin Chinese elm, *kusamono*, junipers. **Workshop registration through The Morton Arboretum.**

**Midwest Bonsai Society Show and Sale, Aug. 18-20** (Fri. noon to 5, Sat. + Sun. 9 to 5), Chicago Botanic Garden, Glencoe, IL. Some details: display of 50 world-class trees; demo and BYOT workshops with Shaner, display of numerous world class trees, judged by **Kathy Shaner**; truly outstanding range of 14 workshops (2 for children), workshop leaders include Shaner, Valavanis, Andy Smith, Jim Doyle, Mark Fields, Frank Mihalic, and others. 20 vendors of wide range of bonsai material, including plants of many types and origins, stones, stands, scrolls, etc. You should follow the link and seriously think about going. The workshop fees are **very reasonable**. **One thing you will not see is boxwoods (see p. 5).**

**Mid-Appalachian Bonsai Kai Show, Sept. 9-10,** [Gray Fossil Site](#) (near Johnson City, TN)

**Carolina Bonsai Expo, Oct. 13-15**, North Carolina Arboretum, Asheville

**An Evening of Bonsai with Rodney Clemons, Thursday, Nov. 2,** 6-8pm, [Waterfront Botanical Gardens](#), Sawyer Hayes Community Center, 2201 Lakeland Road, Louisville. This is actually an annual membership meeting of the WBG, but they are inviting folks interested in bonsai to join them. Admission: WBG members, free; general public \$20; students with ID, \$5. Information on how to obtain tickets and other details of this event will follow in a future issue of this newsletter.

[Winter Silhouette Bonsai Exhibition, Dec. 2-3](#), North Carolina Research Campus, Kannapolis, NC

**2018 American Bonsai Society Convention, April 19-22**, Collinsville, IL (suburban St. Louis)

## IT WAS MABA (Mid-America Bonsai Alliance) 2017

Here are a few highlights from the Indianapolis convention.



**Best Tropical (unknown species)**  
photo by George Buehler



**Best Evergreen (Douglas fir)**  
photo by Barbara Bogan



photo by George Buehler

**Two wonderful  
Japanese white pines!**



photo by Barbara Bogan

## GARDEN VISITS, July 15

Many, many thanks to Bob and Sonya Williams and Tommy and Helen McCurry. We are truly grateful for your sharing with us. We all appreciated your hospitality so much!



**Great grounds, great people, great trees!**



## DISEASE ALERT: BOXWOOD BLIGHT

This is a significant, deadly fungal disease that affects all boxwood species and cultivars, as well as other members of the boxwood family. I recently became aware of this disease at a [Midwest Bonsai Society web site](#). If you follow the preceding link, you will find illustrated symptoms and additional links to Cooperative Extension Service/Agriculture Research Service sites. The bottom line is, **BE EXTREMELY WARY OF ACCEPTING ANY BOXWOODS FROM ANY SOURCE or displaying boxwood bonsai in shows**. Also, you should be alert that other boxwood family (*Buxaceae*) genera (such as *Pachysandra*) carry this disease. —Still another disease we need to worry about! —ed.

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## LIVE AND LEARN DEPT.

**HEAT AND WATER.** It's 4pm EDT Friday, July 21 as I write this. Outside, it's 95°F, dewpoint 72°, relative humidity ~50%, and heat index 103°. To try to keep pot temperatures below 90°, which I consider to be the maximum allowable temperature (even lower for spruces, larches and white pines), my motley crew of trees and wannabe trees has been in the shade since about noon (broadleaved species) or 2pm (heat-tolerant pines and junipers).

You would think that watering every day and sometimes more often would be absolutely necessary under these conditions. However, because of the shade and high humidity, most of my broadleaved plants in bonsai pots are not losing water so fast that they dry out every day. In fact, I know from experience that watering most of my maples every day in hot weather can cause root problems. My soil mix is not extra-coarse, so every day watering is not always required. So, **the parting thought is, no matter what the weather is, check to make sure water is actually needed before watering.**

**ANOTHER CULPRIT FOR CHLOROSIS.** As you know, **chlorosis is the condition of foliage being persistently yellowish**. There are several possible causes for chlorosis . . . Foliage might be immature, root system might be inadequate or, more commonly, there could be a nutrient deficiency or multiple nutrient deficiency.

Well, add one possibility to the list . . . Some of you might remember that several months ago, I was whining about chlorosis in young ungrafted Japanese white pines (JWPs). JWPs grafted on understock of another species don't seem to have the problem. You might recall that I applied micronutrients galore, added live mycorrhizae from native white pine, and other contortions. Finally, I've concluded that the problem is probably inadequate drainage. So, I suggest **if you're growing ungrafted JWPs, including Zuishos, you might want to use a very coarse soil mix.** —ed.



An azalea cutting, Japanese white pine, and evergreen oak, all with chlorosis. The culprit is probably the same for all of these plants: Inadequate drainage, due to the soil mix not being coarse enough, and/or too much water. *Mea culpa.*

One heated evening,  
Katydid sang so strongly  
They overcame us

## SUMMER DORMANCY??—WHAT ARE PLANTS DOING THIS TIME OF YEAR?

by Ross Clark

Here we go into deep water again, to try to explain things not previously covered by any other bonsai venue. I hope you can bear with me, concentrate and follow as we explore another aspect of bonsai “behavior.”

Everyone who grows bonsai in our region has noticed that growth levels off by this time of year. Unless plants are heavily fertilized, twig growth and new leaf formation have nearly ceased by now. Now that the summer solstice has passed, many of the buds that will open next spring are already obviously formed. So **for quite a while now – July to September – for most species, there doesn't seem to be much going on.** I've heard of people speak of this period as the “long green lull” or “summer dormancy.” So, are our plants snoozing, or what?

A widely-accepted definition of dormancy is the “temporary suspension of visible growth of any plant structure containing a **meristem.**” (Meristems are specialized locations where new cells are formed in plants; animals don't have meristems.) Examples of meristems include the vascular cambium which produces growth in diameter, and the apical meristems at the tips of roots and twigs. So, according to the definition above, **if plants were dormant this time of year, the production of new cells would be very slow or “suspended.”** So, are the meristems still producing new cells?

**Meristems certainly are producing cells more slowly at this time of year, but they are still producing some new cells.** A lot of the growth we saw earlier in the season was actually due to the tremendous enlargement of cells formed very early in the season by meristems – and most of that cell enlargement was simply caused by **new stem and leaf cells absorbing tremendous amounts of water**, stretching those tiny new cells to their full size. So, otherwise, what are those plants doing; just sleeping in the sunshine while a few new cells form? No, **plants at this season are still very “busy” playing catch-up and preparing for winter.**

One of the reasons why not as much seems to be happening is that **in many plants, photosynthesis is less efficient in the hot days of summer.** All of the plants we grow as bonsai make their food by the widespread type of photosynthesis that liberates oxygen gas as a by-product. As you know, photosynthesis also removes carbon dioxide ( $\text{CO}_2$ ) from the atmosphere. **Before photosynthesis was well-established** (about 3 billion years ago, we think), **there was a huge amount of  $\text{CO}_2$  in the atmosphere. Consequently, the biochemical method that plants evolved to incorporate  $\text{CO}_2$  into food did not have to be efficient.** However, this inefficient form of picking up  $\text{CO}_2$  (it's called **C3 photosynthesis**) is still the type of photosynthesis that most plants (including all bonsai) use today. **Under conditions today, with much less  $\text{CO}_2$  in the atmosphere\***, when temperatures are higher as in our summers, the enzyme that usually picks up  $\text{CO}_2$  will pick up oxygen instead, **reversing up to 30% of photosynthesis.** (is that amazing, or what?) So, that is why **C3 photosynthesis in mid-summer is less efficient in many plants.** And that's why less seems to be going on with plants – there is actually less **net** food (per unit of leaf surface area) being produced. (There are more efficient types of photosynthesis, such as **C4 photosynthesis**, used by warm season grasses such as corn and crabgrass. But we don't grow those as bonsai!)

**Another “tax” on summer food production is much higher cell respiration.** Cell respiration is the process cells use to break down food to liberate energy to power all life's processes. Cell respiration is much more rapid at higher temperatures than at lower temperatures. Which means that **the food produced by photosynthesis is used more rapidly under warm conditions.** The warmer nights of summer make respiration run faster, which uses up more of the food produced by photosynthesis during daytimes. So, **inefficient photosynthesis and faster respiration are a double penalty to summer food accumulation.** (In photosynthesis, as in finance, how much you make doesn't count as much as how much you keep.)

**So, to repeat, the inefficiency of C3 photosynthesis and increased respiration at higher temperatures are two reasons less seems to be going on.** And the other things happening also are subtle. But actually, they are more visible. Stems are continuing to grow in diameter; it's subtle, but it's happening. **New cells are being added to the stem diameter. A lot of lignin** (see photo, next page—the main substance that makes wood hard) **is being produced and added to cell walls.** These added lignin deposits increase the stiffness and diameters of twigs, branches and trunks. **Smaller roots are being extended and replaced.** (In most root systems, there is a lot of natural “turnover”—dieback and regrowth—of smaller roots.) **Buds are becoming more fully formed. Fruits are ripening.** You also will notice **new bud or twig growth in pines that have been decandled, and additional buds that keep on forming. Cork is being added to**

bark and will soon form a thin layer which will change the surface color of most twigs from green to gray or brown. And here's a biggie – those carbohydrates that powered last spring's growth spurt must be replaced and stored in cells, or the plant cannot survive through next winter and grow next spring. And that's also beginning to happen.

So, there's a lot going on this time of year. And that's why it's recently been suggested that instead of saying that plants are summer dormant, maybe we should say that they are quiescent. But really!? Even quiescent is not an accurate term for what plants are doing at this time of year. Just watch carefully: Plants are doing lots of stuff this month.

#### SOURCES:

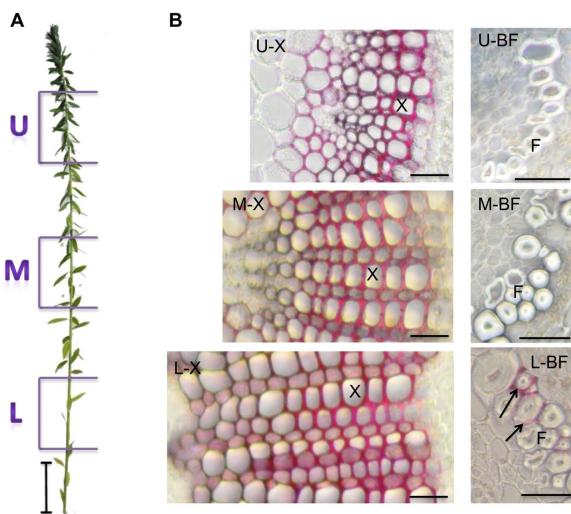
Considine, M.J. & J.A. Considine. 2016. On the language and physiology of dormancy and quiescence in plants. *Journal of Experimental Botany* 67(ii): 3189-3203. DOI: <https://doi.org/10.1093/jxb/erw1-B8>.

Pallardy, S. G. 2008. *Physiology of Woody Plants*, 3<sup>rd</sup> edition. Academic Press, Oxford, England and other locations

Scientific American. Timeline of Photosynthesis on Earth. <https://www.scientificamerican.com/article/timeline-of-photosynthesis-on-earth/> Accessed 2 July 2017.

If you want to learn more about meristems and what they produce, you could go to [www.biology4isc.weebly.com/plant-tissues.html](http://www.biology4isc.weebly.com/plant-tissues.html). Even though the images at this site may be downloaded free for educational use, I have chosen not to do so for this article. This apparently is a web site developed in India, by the way. The Internet is a powerful resource; thank you, India.

\* (from the previous page) As you know, the CO<sub>2</sub> content of the atmosphere is very much in the news these days. The present concentration is a little more than 400 parts per million (ppm) or 0.04%. That doesn't sound like much at all. However, for most of Earth's existence, the CO<sub>2</sub> in atmosphere concentration was much higher, and because of that Earth was a much warmer place than it is today. (even though the sun was smaller and gave off less light). But the catch is, humans were not here during all those earlier times when it was much warmer. Humans evolved recently, under much cooler climate conditions than has been the case for much of Earth's history. So basically, by increasing the CO<sub>2</sub> of the atmosphere, we are conducting an experiment on ourselves, to see if humans can adapt to a world much warmer than has existed for all of human existence. The experiment is progressing rapidly.

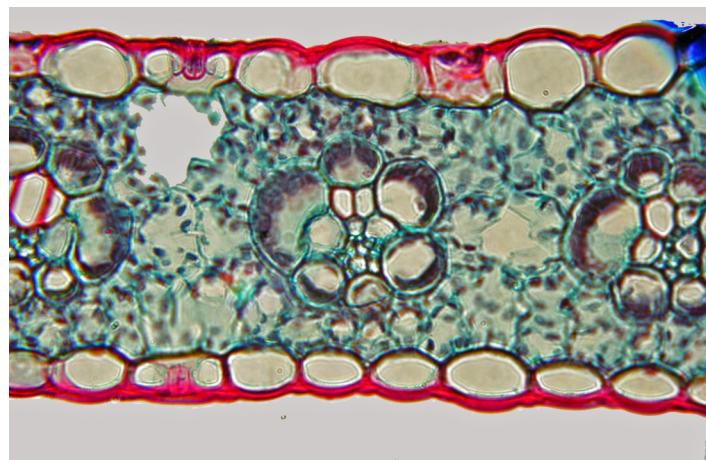


Lignin in the middle tier of images to the left has been stained red. In this case, the lignin has been deposited outside the original cell walls; this will cause some growth in stem diameter. (Notice that the lignified cell walls are quite thick.) They are also much harder: lignin is the hardest organic substance known. No wonder wood is hard! (It's also very hard to digest; even termites need extra help to do it. However, it's figuratively a piece of cake for fungi.)

Courtesy of the scientific journal *Plant Physiology*; [www.plantphysiology.org](http://www.plantphysiology.org).

The internal circles of large cells which contain large dark objects show that this corn leaf belongs to a C4 plant. C3 plants, such as the broadleaved species and conifers we grow as bonsai do not have these specialized structures in their leaves.

Courtesy of the State University of New York at Cortland.



## SEASONAL SUGGESTIONS

**TEMPERATURES** are a more critical factor this time of year, and we need to keep on our toes. **Plants that normally tolerate high light intensities can show permanent leaf damage if they are in full sunlight during times of very high temperatures.** The reason for this is that leaves basically cool themselves by evaporation of water. Liquid water evaporates from the surface of cells in the leaf and diffuses out through the pores (=stomata). As we know from our brush with general science, adding heat to a liquid increases the motion of the molecules in the liquid, and when the molecules are moving fast enough, the liquid turns into a gas. The heat taken up by the evaporating water molecules cools leaves. The energy transfer to evaporating water molecules is what cools leaves, But there are limits to how fast evaporation can occur, and there are limits to the temperatures living cells in leaves can tolerate. So, the bottom line is, **you might want to consider giving at least partial shade even to sun-tolerant plants during the peak heat period of summer.**

That certainly goes for roots too. Last month, we published an article by member Ed Stanton. To justify his reasoning for reducing pot temperatures, Ed did a positive and normal thing: he consulted references he rightly considered to be reliable on the subject of soil temperatures in pots. One of those sources was the **new book by Larry Morton, *Modern Bonsai Practice*.** **Larry included some quite exact values for the temperatures that roots will tolerate.** Several weeks ago, I tried to contact Larry, to find out the source of the exact temperatures he gave in his book. He has never replied. The reason I tried to contact him is that I consider his figures to be inaccurate and misleading. Since I used to work at an arboretum and we were connected to the nursery trade, I think it's probable that Larry obtained his information from some experiments conducted with nursery plants in containers, not from experiments with bonsai. So, what do the plant physiologists and plant ecologists say about this subject? Well, the general thinking is that the roots of plants we're likely to grow as bonsai function best in the 60 to 70°F range. They will grow and function below that, some even down into the low 30s. We should assume that as temperatures exceed this range, roots will be subjected to stress. **In nature, soil temperatures below the soil surface rarely reach 80°F or above, except in desert and semi-desert conditions.** We should always remember that plants grown as bonsai usually are not adapted to conditions in a bonsai container; **our yardstick for assessing tolerances should be where those plants grow in nature, not in nursery or bonsai containers.** And that means, **spruces and larches are adapted to even cooler soil temperatures, say in the range of roughly 40-55°F.** So, in hot weather, we should try to give these plants some shade and put the pots on shaded ground or masonry which will remain cooler. Our aim should be to try to keep soil temperatures in a range where the root systems are not stressed. That is a far way lower than killing temperatures.

Keep **WATERING!** But remember, when the rate of evaporation from soil in pots increases, so does the opportunity for mineral accumulation in the soil, which can become toxic to roots. So, we should try to use water that does not contain as many dissolved minerals. Low-pH, low chlorine water is best. Rain water is a good source, and, surprise! . . . It is what plants are best adapted to. There are exceptions, of course. Naturally, some plants tolerate more dissolved minerals than others. Azaleas, spruces and larches grow much better when watered with water testing below pH 6. Rain water, in the "ancient" experiments I'm acquainted with, comes in about pH 5.7. However, air pollution (especially nitrogen oxides) has increased since those experiments were done, so especially near cities, the pH of rain is probably often even lower nowadays. **Watch out for hot breezy days** — they can dry bonsai containers out in a jiffy.

Don't neglect **FERTILIZATION.** But it's time to downshift to fertilizers with less nitrogen, and to cut the concentration of the whole fertilizer package. Low maintenance doses are what plants need now. And by the first of September, we should seriously feeding zero nitrogen for the rest of the season. *Indicum* azaleas may still be growing vigorously, so we could keep using (acidic) azalea or orchid fertilizer with high nitrogen into August. But by September, azaleas too should be fed with low nitrogen, high-potassium and phosphorus, to encourage hardening off and flower bud formation.

As always, **keep a sharp eye out for fungal damage**, and treat problems early. Under the conditions of this summer — numerous episodes of high humidity and high temperature, fungi can do a lot of damage in a short time. It might be a good idea to treat susceptible plants after each deluge of rain. And we've had some deluges, for sure.—ed.

## ADVERTISING (free to members)

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### SPECIMEN BONSAI FOR SALE

Sometimes it's worth it to take the time, expense and risk of traveling hundreds of miles and/or incurring big shipping expenses to buy a bonsai that has no special connection with GLBS. However, if a nice tree is available and the price is right, please also consider buying from fellow GLBS members. You might get a lot more for your money that way. It's one of the great ways to enhance your bonsai collection.

**Trident maple grove** (*Acer buergerianum*), five years in training, approximately 22" spread, 28" tall. Lovely Tokoname pot is approximately 18 x 12 x 2.5" oval, glazed, Oribe with copper accents. \$260. Contact Ed Stanton at (859) 552-8215 or  
[<Stanton@uky.edu>](mailto:<Stanton@uky.edu>)



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## ADVERTISING continued

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