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The Vine Line

Greetings to all,

Summer is starting to wind down. As I do chores in the evening, it is becoming apparent that each day is slightly shorter than the last. I really do not like the shorter days because it means part of what I do at the end of the day entails using a flashlight. Also, as I get older I really dread colder weather. Part of the reason we moved to Memphis from Northern Illinois, over thirty years ago was to avoid cold weather. While our winters can't hold a candle next to a Chicago winter, I would be happy if we could go directly from Thanksgiving to March 1st.

The past couple of months we have been sticking cuttings of many shrubs, trees and a few tropical plants in our greenhouse operation. It is a long process that often takes two or more years to make a landscape size plant. I never get over the wonder that a small cutting can become a beautiful grown specimen. The same can also be said of sowing seeds. I think that propagation is what has had the most attraction to me in Horticulture and it continues to hold my attention after decades of doing it. It is particularly gratifying to grow something new and figure out what it takes to make it thrive in the conditions I have available. Obviously I'm not always successful, but it sure is fun trying!



While we have had a couple of dry periods this summer, overall we have had adequate rain. Most trees and shrubs have not suffered from drought and people that I know who grow edibles have had a good season.

In this Issue of Vine Line, Blair Combest will talk about transitioning his garden from growing summer vegetables to fall crops and his strategy for starting seeds and transplanting them into the ground. With a little ingenuity it

is possible to have something edible from your garden year round in our climate.

Bo Kelly, our Arborist will tell you about how conifers have changed and evolved over melania to what they are today. As recently as 200 years ago, the only native conifer you would have found growing in our area would have been the Red Cedar, Juniperus

virginiana. Even the Loblolly and Slash pines we take for granted were brought here from other parts of the South. This is a very thought provoking article, that I'm sure you will enjoy reading.

Enjoy the rest of your summer and stay safe,

Rick



MBG Director of Horticulture

The Urban Home Garden: Summer and Fall



Summer crops did rather well this season despite the sporadic weather we have had here in the 901. The thornless, Osage and Navaho varieties in the blackberry bed, though heavily pilfered, produced prolifically. In traditional rows, I tried eight tomato varieties using the Florida weave method—long rows, stakes at either end, stout twine woven around the plants—and I have not been happy with this technique. My feelings toward this method stem greatly, I believe, from this being my first attempt at this process coupled with the fact that, though the tomatoes are supported like they should be, I simply do not like the aesthetics. You may, however. The two other rows have eggplant and peppers growing well. In the raised beds I started artichokes, opal basil, marigolds, cucumbers, bird house and dinosaur gourds, delice de la table melons, yellow patio tomatoes, okra and pea vine. Of these, my favorites

would be the patio tomatoes from All American Seeds, both gourds, and the melons.

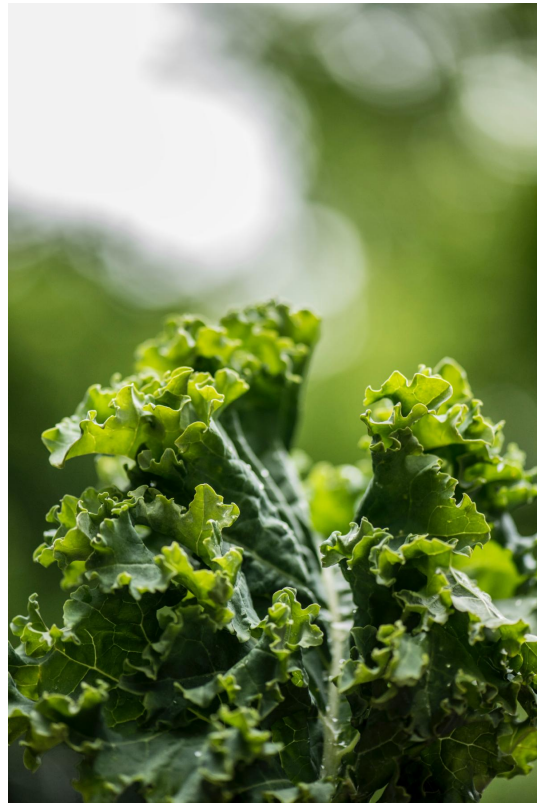
Last year I had quite a bit of trouble with the fruit trees with regards to cedar apple rust (*Gymnosporangium juniperivirginianae*)—a fungal pathogen that damages the foliage of apple and crabapple trees. My reaction to this was to be more vigilant in my spraying regimen this spring. I rotated between two fungicides—copper and manganese based. I did this at least once a week and after every rain, as well. This, reader, worked like a charm, as my Gala apple, that which did not fruit at all last season, bore fruit. But, alas, before I could see it mature, all fruit was picked by a hungry critter or hungry guest!

So, this is where I am now. Pretty soon most of these annual herbs and vegetables will have completed their lives, be pulled up, and composted. What will take their place? What crops do I like? What grows well around here in the fall? These are questions you should ask yourself when you start seeing your cucumber leaves turning crispy and your tomato production declining.

Just yesterday I started some chard, mustard greens, and several kales. In trying to find an appropriate place around here to germinate them, as the volunteer greenhouse is too hot right now, Jill Maybry—Butterfly and Delta Garden—and I did some digging to find the optimal germinating temperatures for these greens. Surprisingly, the optimal temperatures for

these crops were between 80 and 88 degrees! This was kind of counter-intuitive, I think. At home, I guess I never really thought of it, as I would just direct sow the fall crop in the ground and hope for the best. Here, I plan on starting them in some shade, up-potting to 4" pots when they have true leaves, eventually transplanting to the beds the first week of October. At your house, a shaded area could mean a back porch or a car port or the like.

Along with these greens, I plan on direct sowing, this week, Golden Sweet Pea and Royal Snap Pea. Beds of collard greens and clover cover crops will go in very soon after.



By the end of August, I plan on starting kohlrabi, Joi choi, broccoli, and carrots. *Note: I have had very good luck using frost cloth to extend the life of these crops, especially carrots and chard—harvesting clear into late spring.*

Update: The seeds I started on the 13th of August were germinated by the 16th. So get some fall crop seeds and get to work.

By Blair Combest, MBG horticulturist

Reign of Titans: The Rise and Fall of Conifers in the Ancient World



A shroud of fog hovers, wraith-like, above an endless swamp of primitive trees. Predatory amphibians the size of alligators wait by the water's edge for a meal to swim within reach, while dragonflies dart across the marshland, maneuvering with monstrous wingspans over two feet in length. The air is rich with oxygen, a consequence of the miracle of photosynthesis occurring across the globe at rates never before seen, carried by terrestrial plants now larger than anything the world has ever known. Mile after mile the landscape is unchanged; year after year: unchanged. Decades fade into centuries, centuries into millennia, and time slips by unnoticed for millions of years: a quiet morning in the eyes of the universe. In this world, a vast tropical swamp unaffected by seasonal change or climatic disturbance, the ancestors of modern conifers begin to evolve, some 300 million years ago.

The parameters that influence the evolution of life on planet Earth have changed dramatically, and often catastrophically, throughout its history. Factors such as climate, sea level, atmospheric gases, and continental drift can all influence the success or demise of evolving species. At the time and place of ancestral conifer emergence, global conditions were relatively stable. Laurussia, a supercontinent composed of modern-day North America, Greenland, and much of Europe remained intact and centered around the equator for a period of roughly 150 million years. The climate here was warm and humid, similar to modern-day tropical rainforests. Here, conifers first entered the arena of life, dispersed among the forests of extinct *Lepidodendron*, primitive trees standing 100 feet tall, with straight trunks capped by an umbrella of strap-like leaves. Conifers lay in wait, grasping a small foothold within the swamplands, full of evolutionary potential.

Conifers are members of a special group of plants called gymnosperms, meaning “naked seed.” The reproductive structure of the seed had not yet been fully established prior to gymnosperm evolution; plants relied on water or wind for transfer of genetic material in the form of spores and almost certainly had to be found near a source of water. Seeds offer



an unprecedented level of protection, simultaneously providing a food source and preventing desiccation for the developing embryo. Conifers evolved to become fairly drought tolerant all around, evidenced by specialized foliage. Adapting thick cuticles and lower surface area to volume ratios per leaf, conifers avoid desiccation by preventing excessive water loss through transpiration in hot or dry conditions. The advent of the seed and waxy foliage allowed conifers to begin lessening their dependence on water (a beautiful parallel exists within the reptilian line who, evolving the amniotic egg, were able to survive further and further from sources of water, differentiating themselves from their water-dependent, amphibian ancestors). Within conifers, the seed was being honed and perfected, life was able to move further and further inland. Ancestral conifers began leaving the boundaries of the marshlands, better able to survive the dry and desolate continental interior.

Conifers were primed to expand across the globe, crafting forests out of deserts. However, near the end of Permian period (~250 million years ago), the planet began to warm dramatically, and the climate became increasingly hot and dry. Glaciers disappeared, land masses coalesced, and global volcanic activity was increasing, altering atmospheric gases. These changes took place rapidly, in the blink of an eye on the geological timescale, and the majority of marine and terrestrial life could not evolve quickly enough to survive. Over 90% of all species on Earth were wiped out, making this the most devastating mass extinction event in Earth's history. Conifers were not exempt, although their recent adaptation to drier habitats may have afforded them higher survivability than other species. At any rate, an immense number of ecological niches and their associated species were destroyed. With such a massive void to fill, many surviving taxonomic groups showed rapid speciation over the periods to follow.

Fossil records show an increase in conifer species following the Permian extinction, indicating rapid speciation beginning roughly 200 million years ago, correlating with a cooling and more habitable planet. It is around this time that the familiar conifers of today begin to take shape. Spruce, pine, fir, hemlock, all towering above the earth, created the backbone of primitive forest ecosystems. The first mammals emerged, massive herbaceous dinosaurs browsed the resinous foliage, and insects evolved at alarming rates, filling the infinite number of niches created in the forest. Atmospheric carbon is estimated to be 3 to 4 times higher than it is today, creating an endless pool of fuel, and massive growth potential for the ever-expanding forest. The mechanism of photosynthesis

was an unstoppable force, forging ahead unchecked. Higher and higher the conifers climbed, reaching heights greater than 400 feet in some species. They became hardy: weathering the seasons now experienced at higher latitudes; resilient: enduring winds of higher elevations; steadfast: single individuals persisting for thousands of years. Found across the globe, conifers established the largest forests ever seen. Yet almost as soon as they reached the pinnacle of evolution, a group of plants known as angiosperms, dressed and pinned ornately with flowers, began to evolve adaptations better suited to the ever-changing world. The cycle began anew, with another seeking the crown.

The dominance of conifers represents the transience of life and evolution on planet Earth. Angiosperms spread rapidly, diversifying and filling in ecological gaps, outcompeting conifers in almost every habitat. Some species of conifers still maintain a presence in temperate and tropical areas, where the habitat is just right for their existence, but those are surely exceptions. Conifers exist at their greatest numbers in areas too drought stricken or cold for most angiosperms. The Tiaga, a massive boreal forest that circles the globe containing one-third of all trees on the planet, may be the last stronghold of the once great conifer kingdom. Certainly then, the Pacific Northwest of North America serves as the citadel. Here, time is transported to a world long since passed. A small tribe of conifer species vie for space against the encroaching borders of change, generating an ecosystem that gives the feeling of stability amid chaos. Biodiversity is much lower in this region, compared to angiosperm dominated tropical rainforests, but this area contains far more biomass found within only a fraction of species. Where they reign, they do so with utter surety. Worldwide there are roughly 60,000 different tree species and only 600 of them are conifers: 1%. Though they are few, conifers have achieved feats that are nearly untouchable by angiosperms. The tallest tree (coastal redwood – 380ft), the oldest tree (bristlecone pine – 5,000 years old), the largest single-stemmed tree by mass (giant sequoia – 1,910 tonnes...equal to 10 blue whales), and the largest tree by diameter (Montezuma cypress – 38ft across), are all titles currently held by conifers. Titles that speak to their grandeur, prowess, and supremacy of old. Truly the last bastion of titans holding on in a world that has left them behind. Alas, no king rules forever.

By Bo Kelley, MBG Arborist

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