

Green Gazette

Commercial Ornamental Horticulture News for East Tennessee

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In this Issue:

Something to Look At, p.1

Beat the Heat, p. 4

Six Tips to Reduce Disease in the Landscape, p. 6

Greetings East Tennessee,

This is the second issue of the Green Gazette, a Tennessee Extension-sponsored, quarterly newsletter featuring news, articles, events, and helpful information for the nursery, greenhouse, and landscape professionals in East Tennessee.

Something To Look At

Each of us at some point in our lives has been a customer for some type of retail product. If we think about our habits as we shop, it is likely that most of us respond to largely visual cues. Eye-catching colors and displays grab our attention. Once our attention is captured, we are then able to notice the other items and services that the outlet has to offer, regardless of how much they may relate to what originally caught our attention. Retail green industry businesses can use these psychological tendencies to benefit their sales, and many already do. This is why many garden center displays have the color and bedding plants near the front and entrances, which may include pictures of what the plants will look like in full bloom. Bright colors not only capture customer attention, but they can stimulate one's mood,

Upcoming Extension & TNLA Events

ETNLA – Eastern Chapter TNLA Meetings (second Tuesdays each month)

Next Meeting: June 9th, 2015

11:00am – 1:00pm

Dead End BBQ

3621 Sutherland Ave

Knoxville, TN 37919

TSU Field Day

Tennessee State University

Nursery Research Center

June 17th, 2015

472 Cadillac Lane

McMinnville, TN 37110

More Information:

http://www.tnstate.edu/agriculture/documents/NRC_Field_Day_Brochure.pdf

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Tennessee Green Industry Field Day at the UT Gardens

June 23rd, 2015

2431 Joe Johnson Drive

Knoxville, TN 37996

Registration: \$25 by 6/15

Pesticide Points Available

More Information:

<http://files.ctctcdn.com/aaba08c7001/adac4156-ab78-44bf-a3dd-dd71d511c461.pdf>

See Inside for Industry Events

especially since many customers shopping for plants are doing so in order to add color to their personal spaces.



Figure 1. Color display tables attract customers at Misty Mountain Greenhouse in Cleveland, TN.

Anything that can add color to brighten the sales area can positively impact sales. But what if you don't sell bedding plants, or other particularly colorful items? One way to include more color in your sales area is the use of colored benches or other sales display structures. Rather than using plain wood or metal, paint these surfaces with a bright color, which will naturally attract attention. Another eye-catching addition is the use of colored shade cloth. Shade cloth is used in retail areas not only to keep light levels appropriate for shade-loving plants, but also to provide customer comfort in walkways and sales areas for items other than plants. Rather than using the typical black shade cloth, consider blue, green, pink, or silver. Colored shade cloth can easily be noticed from the road as well, which can attract customers whose plans did not originally include shopping at your outlet.

How Will It Affect My Plants?

One natural question concerning the use of colored shade cloth is, "how will the colored shade affect plant growth?" We see a variety of colors because each color is a different wavelength of light. Since plants have specific receptors for blue, green, UV, and red/far red light, such partitioning of available light can have effects on the growth habit of plants, but their effects depend highly on the type of plant and time spent under the shade. It is widely known that in most plants, shading produces a "shade avoidance syndrome" that causes a plant's internodes to lengthen, with branches becoming longer, thinner, and more sparsely leafed.

Upcoming Industry Events

Tennessee Green Industry Expo

September 17 – 18, 2015

Music City Center

201 5th Avenue South

Nashville, TN 37203

Register Here:

<http://www.tngie.com/>

Cultivate '15

July 11 – 14, 2015

Greater Columbus Convention Center

400 N. High Street

Columbus, Ohio 43215

Register Here:

<http://cultivate15.org/>

Southern Nursery Association Meeting 2015

July 21-23, 2015

Georgia International Convention Center

2000 Convention Center

Concourse

Atlanta, GA 30337

Register Here:

<http://www.sna.org/>

Farwest Trade Show

August 27 – 29, 2015

The Oregon Convention Center

777 Northeast Martin Luther King Jr. Blvd

Portland, OR 97232

Register Here:

<http://www.farwestshow.com/>



Figure 2. Pink shadecloth. Source: Rimol Greenhouse Systems

grown for months or years under colored shade cloth, blue netting has shown a tendency to reduce leaf number, branch length, and fresh weight in Philodendron, Pittosporum, and cast iron plant, respectively, while red tended to increase leaf number and branch length (Stamps, 2009). When using shade cloth in retail areas for plant display only, the amount of time spent under shade is minimal and likely has little effect.

Display Specimens and Gardens

Another visually attractive sales technique is the use of mature specimens to demonstrate the future qualities of the plants you are selling. If marketing a plant based on its dwarfing characteristics, having a mature specimen to show its dwarfing characteristics is a great help to potential buyers. Likewise, if a certain plant makes a good showpiece because of its prolific blooms, display a more mature specimen that can show off those blooms and let customers know what they can look forward to. Providing this visual information can not only make the plant more attractive, but can also improve the image of the business as a knowledgeable and helpful outlet.

In addition to quality products, customers desire sellers who can give advice on the right plants to use and how to maintain them. A knowledgeable and helpful sales staff lets the customer know that the business not only knows their products, but cares about the satisfaction of the customer with his or her buying choices. These displays make the same positive communication while staff are not vocally interacting with the customers. With vocal and visual



Figure 3. Display gardens showcase potential uses for plants at Evergreen in Johnson City.



Figure 4. Indian Creek Nursery in Erwin provides a mature specimen to show off the future habit of these 4-inch petunias.

Resources:

Arthurs, S.P., Stamps, R.H., and F.F. Giglia. (2013). Environmental Modification Inside Photosensitive Shadehouses. *Hortscience*, 48: 975-979.

Stamps, R.H. (2009). Use of Colored Shade Netting in Horticulture. *Hortscience*, 44(2):239-241.

Beat the Heat

As summer rapidly approaches, many growers are already dealing with high greenhouse temperatures. Greenhouse cooling can easily be the most expensive input in the greenhouse business. Knowing how to properly size your ventilation and cooling system can save a lot of money through energy use and plant health.

Greenhouse heat builds up when short-wavelength radiation (visible and UV) enters through the glazing (greenhouse covering material) and heats the objects inside the greenhouse. These objects (plants, benches, floors, etc.) then reflect this heat as longer wavelength (infrared, non-visible) radiation, or heat. Energy can enter the greenhouse because the glazing is permeable to visible and UV radiation, but remains trapped as heat because glazing materials are not as permeable to infrared radiation. Therefore, during the summer months, when light is more intense from the sun, and the surrounding air is warmer, cooling is needed to keep greenhouse temperatures safe for plants. Temperatures above 90F can cause heat injury and death. It is best to keep greenhouse temperatures 85F and lower.



Figure 5. Check the manufacturer's specifications to find out how much air your fan will move.

Sources of Resistance	Condition	Static Pressure (inches of water)
Properly sized and managed inlet		0.04
Shutter	Clean	0.02 – 0.10
	Dirty	0.05 – 0.20
Exhausting against wind (no wind shielding)	5 mph	0.02
	10 mph	0.05
	15 mph	0.10
	20 mph	0.20
Clean fan guards	Wire mesh	0.05 – 0.15
	Round ring	0.01 – 0.02
Ducts	Geothermal tubes	0.50 – 1.50
	Solar collector	0.20 – 1.00

Figure 6. Table showing changes in static pressure due to various conditions
Source: E.F. Wheeler. *Selecting Rated Ventilation Fans.*

To achieve lower temperatures, warm air in the greenhouse must be exchanged for outside, cooler air using fans and inlets. As fans exhaust warm air to the outside of the greenhouse, negative pressure draws cooler outside air into the greenhouse. This process is termed "air exchange." During the warm summer months, it is advisable to exchange at least one volume

of air equal to the volume of greenhouse space at least once per minute. To calculate the volume of your greenhouse, multiply the length, width, and height of the house, in feet. This answer will be the cubic feet per minute of air your fans will collectively need to move. When checking fan ratings for these numbers, keep in mind that the published numbers are ideal and do not represent the air that would actually be moved from a greenhouse. Number of inlets, outside wind speeds, leaks, and types and condition of shutters will all affect how much air can actually be moved by the fan. Any resistance to the outflow of air creates something called "static pressure," which is measured in inches of water. Static pressures within a greenhouse can range from 0.1 - 0.5 depending on the setup. These impedances must be accounted for when determining the fan capacity needed. The above table (Figure 6) summarizes how much static pressure various impedances can cause. Consult the specifications of your fan, noting the horsepower of the

MODEL	SPEED	BLADE DIAMETER	RPM	HP	CFM @ STATIC PRESSURE				FRAMING DIMENSIONS
					0.00"	0.10"	0.125"	0.25"	
S8-B2	Two	8"	1600/1300	1/40	360/300	270/150	230/110	0	11" X 11"
S10-B2	Two	10"	1600/1300	1/40	690/580	590/460	570/390	0	13" X 13"
S12-E1	Single	12"	1625	1/4	1640	1540	1510	1390	15" X 15"
S12-E2	Two	12"	1725/1140	1/4	1650/1090	1550/950	1520/930	1390/0	15" X 15"
S12-EVD	Variable	12"	1700	1/3	1650	1540	1510	1390	15" X 15"
S14-E1	Single	14"	1625	1/4	2170	2070	2030	1860	17" X 17"
S14-E2	Two	14"	1725/1140	1/4	2180/1350	2080/1190	2060/1160	1890/0	17" X 17"
S16-E1	Single	16"	1625	1/4	2370	2270	2210	2060	19" X 19"
S16-E2	Two	16"	1725/1140	1/4	2380/1640	2280/1490	2230/1430	2070/0	19" X 19"
S16-EVD	Variable	16"	1700	1/3	2370	2270	2210	2063	19" X 19"
S18-F1	Single	18"	1625	1/3	3200	3090	3040	2920	21" X 21"
S18-F2	Two	18"	1725/1140	1/3	3200/2100	3090/1890	3040/1820	2920/0	21" X 21"
S18-FVD	Variable	18"	1700	1/3	3150	3050	2980	2860	21" X 21"
S20-F1	Single	20"	1625	1/3	3420	3220	3170	2920	23" X 23"
S20-F2	Two	20"	1725/1140	1/3	3440/2300	3240/2000	3180/1950	2930/0	23" X 23"
SD24-F1	Single	24"	1100	1/3	5600	4500	4300	3600	27" X 27"
SD24-GVD	Variable	24"	1100	1/3	5050	4910	4810	4400	27" X 27"
SD30-G1D	Single	30"	1100	1/3	8000	7000	6000	5000	33" X 33"
SD36-G1D	Single	36"	850	1/2	12000	11000	10500	9500	39" X 39"

Figure 7. Example of a manufacturer's specifications for fan performance at various static pressures for their various fan models.

motor and the blade size. The manufacturer's specifications should list the cubic feet per minute (CFM) of air moved for different static pressures.

When estimating the volume of air to exchange and the number of fans needed to do so, estimate high on the air needed to be moved, and estimate low on the amount of air that will be moved per

fan. This will ensure adequate cooling capacity of your greenhouse during the hottest months.

Keep in mind the use of fan ventilation can only reduce the air temperature to that of the outside temperature. Any further reductions in temperature will have to be achieved through the use of evaporative cooling pads, which force inlet air through moistened aspen fiber or cellulose pads that cool the air entering the greenhouse. The effectiveness of these systems decreases with humidity and the number of plants in the greenhouse. The presence of plants increases transpiration within the greenhouse, thereby increasing indoor humidity. Fortunately this humidity also has a cooling effect.

Additional cooling techniques for the greenhouse include use of shade cloth to reduce the visible light entering the greenhouse. Maximum cooling effect occurs when the shade cloth is installed on the *outside* surface of the greenhouse, especially if using black cloth (remember that greenhouses trap heat when objects inside the greenhouse absorb and reflect energy back into the greenhouse space). Remember that reducing the light reaching the plants affects growth by causing stretching or lengthening time to flowering. Use lower shading factors for flowering bedding plants and vegetables (30%) and higher shade factors for woody plants, shade-loving plants, and houseplants (40-60%).

Resources:

Wheeler, E.F. *Selecting Rated Ventilation Fans*. PennState Agricultural and Biological Engineering Cooperative Extension Publication #G85. May 1996. Access: <http://extension.psu.edu/publications/g-85/view>

Willits, D.H. *Greenhouse Cooling*. Georgia Commercial Flower Growers Association Newsletter. July – August 1994. Pg. 31. Access: http://hortscans.ces.ncsu.edu/library/floriculture/doc_id/944/Greenhouse-Cooling.pdf

Six Tips to Reduce Disease in the Landscape

Landscapers and homeowners often find themselves trying to remedy a disease or condition in the landscape, hoping a chemical application will solve the problem once and for all. The problem with most landscape diseases is that unfortunately, once the disease has been found, little can be done to fully restore the plant to its healthy condition. Sprays and maintaining plant health can reduce disease spread, but the affected tissue will remain damaged. Here are six tips that can help reduce the chances of disease development in the first place:

1. **Avoid using too much mulch:** Mulches are an excellent way to protect tree roots, conserve moisture in the root zone, buffer soil temperature, and manage grasses and weeds in areas difficult to reach with maintenance equipment. The best mulches are of organic origin – pine straw, aged bark, clippings, trimmings, etc. Because of its moisture-conserving



Figure 8. Mulch volcanoes are not recommended.

properties, however, too much mulch can be a bad thing. Avoid using “mulch volcanoes” around trees and shrubs. Only 2 – 4 inches of mulch is needed surrounding new trees and shrubs, and should cover the area over the root zone. The mulch should not be scooped up against the trunk, but rather pulled away from the base to prevent excess moisture at the crown. Too much mulch can also harbor other disease causing fungal organisms, insects, and damage-causing wildlife.

2. **Pick up pruning trimmings:** As we dead-head and prune our summer-blooming plants, it is important to make sure we pick up what is trimmed off of trees and shrubs. Although the material may be dead, disease pathogens can still live and feed on the removed twigs and branches, forming spores and other inoculum that can then travel and infect healthy plants.
3. **Irrigate during the morning and day:** Many opinions exist on the best time of day for irrigation. For humid areas that receive a lot of rain, avoid irrigating during the evening and night hours. When the foliage stays wet and cool, fungal spores are more likely to germinate and cause infection. Irrigating during the day and early morning gives the foliage time to dry.
4. **Consider switching to drip irrigation:** Drip irrigation applies water directly to the root zone, decreasing the water that is lost to evaporation and allowing the foliage to stay dry throughout the day. Dry foliage resists fungal and bacterial diseases better than wet foliage.
5. **Avoid applying too much water:** Like wet foliage, consistently wet root systems are more susceptible to disease as well. Phytophthora and pythium diseases thrive in wet conditions, and irreversibly damage plant root systems. Avoid constantly saturating the root zone, which also depletes necessary oxygen. Irrigating during the day helps dry the root zone by nighttime as well.
6. **Spray preventatively, not reactively:** Pesticides are most effective when used preventatively, instead of as a cure for an established disease. Spraying during the proper times and when disease organisms are most susceptible will decrease overall chemical use and lessen the damage done by disease organisms. Apply fungicides and insecticides early in the mornings during dry weather. This avoids harming beneficial pollinating insects (which can help control some damaging insects) and allows foliage to dry and have better residual effect. Knowing more about the biology of pests can help you determine the point in the disease or pest life cycle when spraying is most efficient. Always follow label instructions and safety as well.

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