FloriBytes - Digital newsletter for the floriculture industry

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TOPICS IN THIS ISSUE:

GREENHOUSE MANAGEMENT

Crop Compartmentalization *From Dr. Claudio Pasian (pasian.1@osu.edu)*

Compartmentalization. It is a long word and I always struggle saying it. However, it is an important one when it comes to growing bedding and potting plants in greenhouses. It is very common to enter a greenhouse with bedding plants in the U.S. and see, at least, 4 to 6 crops and, at least twice as many cultivars. The Dutch industry on the other hand tends limit crops to one or two per greenhouse.

The reality is that different crops have different cultural requirements. The "one size fits all" approach common to U.S. growers has disadvantages that far outweigh the advantages. To meet the needs of different cultural requirements, crops can be divided (and grown apart) at least based on two environmental characteristics: temperature and substrate pH.

Some crops grow well at lower temperatures than others, for example: nemesias, bacopas, snapdragons, diascias, scaevolas, ostreospermums, etc. By separating these crops from geraniums, begonias, and others the temperatures can be lowered in the greenhouses where the cool crops are grown. This has the added advantage of fuel savings. These crops can be sold earlier, opening space for other plantings, or can be moved outdoors in early spring until they are sold later.

Crops can be also separated based on their substrate preferences. Paul Fisher and Bill Argo have divided crops into three groups based on their efficiency in picking up iron from the substrate: geranium, general, and petunia groups. In the geranium group we can find plants such as lisianthus, marigolds, N.G. impatiens and of course,

seed and zonal geraniums. In the petunia group, we find plants like calibrachoas, scaevolas, snapdragons, bacopa, etc. If you can establish a system in your greenhouses where you keep all crops separated based on their response to soil pH, you can then treat them differently according to their needs.

For example, it is possible to have different injectors in different zones using different fertilizer types: acidic for the petunia group and neutral or basic for the geranium group. You can also acidify water at different levels since the tolerance to high alkalinity water will be different for each of these three groups.

I know that compartmentalization is more easily said than done. However, before transplanting your crops, think about how you will manage your space. The effort It may very well pay off with a nice "ka-ching" sound at the cash register!

Burning Shelled Corn *By Beth Fausey (fausey.11@cfaes.osu.edu)*

Many growers have expressed an interest in corn burner systems for heating retail and greenhouse spaces. Dr. Dennis Buffington from Pennsylvania State University recently presented information on corn burners at OSU's Greenhouse Energy Management Workshop held in Wooster, Ohio. Dennis created a website, http://burncorn.cas.psu.edu/, full of useful information on burning shelled corn. Topics include heat energy content, storage and quality requirements, corn energy equivalents, an energy selector aide, and a listing of residential, commercial and industrial manufacturers of corn stoves and boilers. I have highlighted some of the basic information on burning shelled corn.

Energy content. The energy content of corn is generally 8,000 to 8,500 BTU per pound of **dry** matter but varies with variety, weather during the growing season and at harvest as well as with management practices during drying and storage. The caveat is that corn has a standard moisture content of 15.5% which means that every pound of corn is really 0.155 pounds of water and 0.845 pounds of dry matter. Additional energy is needed to evaporate the water, leaving the net energy content of a pound of shelled corn with 15.5% moisture at 6808 BTU. Dennis has observed that exaggerated energy contents have been used by some corn burner manufacturers in analyses – and values above 7000 BTU should be viewed with caution.

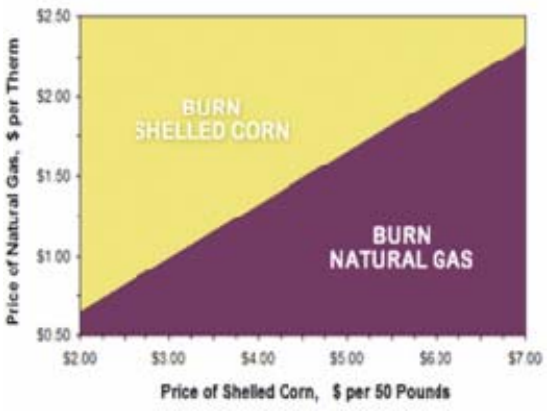
Quality. Select corn with a moisture content at or below 15.5%. Higher moisture contents promote mold and mildew growth leading to spoilage, distribution difficulties due to clumping and potential respiratory problems in workers. Higher moisture contents also decrease the amount of heat generated from each pound of corn. Shelled corn should also be clean and free of cobs, husks, stones, residues, and with a minimal number of broken kernals. Specify U.S. Grade #2 or U.S. Grade #1 which have fewer broken kernals and foreign materials.

Storage requirements. One bushel of 15.5% moisture shelled corn weighs 56 pounds and requires 1.25 ft^3 of storage volume. Shelled corn should be stored in a

clean, dry environment away from rodents, birds, etc. Bulk storage containers should be open and allow for ample air circulation around and through the corn. Inspect regularly for disease and insect pests.

EnergySelector. Dennis has created an energy selector that will help you decide which fuel is best for your heating purposes. EnergySelector is a user-friendly tool that compares the heating values of two energy sources and considers both heat content as well as combustion efficiencies of each source. The selector presents a comparative graph where the price of each heating source is identified. Lines are drawn from each price point and intersect in the region of the more economical fuel choice. An example of corn vs. natural gas is presented below.

Example 1. Shelled corn is purchased for $2.50 per 50 pounds and natural gas is $1.50 per therm.



The lines intersect in the “Burn Shelled Corn” portion of the graph. On the basis of heat of combustion, it is cheaper to burn corn than natural gas. However, one must also consider the additional expenses in burning corn versus natural gas such as burner purchase, handling and storage of corn, emissions control, disposal of ash, etc.

Example 2. If shelled corn cost $5.00 per 50 pounds and natural gas cost $1.00 per therm, then the lines would intersect in the “Burn Natural Gas” portion of the graph.

PEST MANAGEMENT

Be on the look out for aphids *From Ray Cloyd (rcloyd@ksu.edu)*

Aphids are typically one of the first insect pests encountered in greenhouses primarily on herbaceous annuals and perennials that are present in spring. Aphids, in general, feed on new terminal growth, flower buds, and leaf undersides. In order to minimize problems with aphids avoid overfertilizing plants with nitrogen-based fertilizers. In addition, keep plants "healthy" by avoiding stress (e.g. improper watering practices).

Healthy plants are able to defend themselves by producing indole acetic acid (IAA), which reduces aphid feeding. Stressed plants don't produce sufficient quantities of IAA to defend themselves so they are more susceptible to attack by aphids.

The neonicotinoid-based insecticides such as imidacloprid (Marathon), thiamethoxam (Flagship), acetamiprid (TriStar), dinotefuran (Safari), and clothianidin (Celero) are primarily used to control aphids. Additional pest control materials for aphid control include pymetrozine (Endeavor), flonicamid (Aria), Beauveria bassiana (BotaniGard/Naturalis), acephate (Orthene), potassium salts of fatty acids (M-Pede), and petroleum oil (PureSpray Green). Remember to routinely monitor--via visual inspection--susceptible plants in order to prevent aphid populations from building-up to damaging levels.