A Publication of the UMass Extension Greenhouse Crops & Floriculture Program

Floral Notes Newsletter

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Stockbridge School of Agriculture Update

This year for the first time SSA will offer its new students the choice of a B.S. degree in Sustainable Horticulture, Sustainable Food and Farming, or Turfgrass Management as well as the current 2-year A.S. degrees. Doug Cox is the Major Advisor for both groups of students. Currently a total of 50 students are studying horticulture with about 20 in the A.S. program and 30 pursuing a B.S. Nowadays when we talk about SSA we are talking about both groups of students and not just the former two-year program.

Some of you may be interested to know that the French Hall greenhouses are in the process of being demolished. They will be crushed and hauled off to an appropriate disposal site. Kind of sad! Then it seems that the site will be used for a new "Integrated Design" building which would become the home of Landscape Architecture and Regional Planning and several other related programs. French Hall would be renovated and become part of the new building.

Upcoming Events!

December 17-19 New England Vegetable & Fruit Conference

February 2014 Winter Flower Growers Program

July 2014 Summer Field Day

November 5-6, 2014 Northeast Greenhouse Conference

The Ins and Outs of Biological Control

Wednesday, November 6, 2013 - 9:30am to 3:00pm

Publick House, Sturbridge

Program is co-sponsored by UMass Extension Greenhouse Crops and Floriculture Program and UConn Extension. Partial funding for this program is from a grant from New England Floriculture Inc. sponsors of the Northeast Greenhouse Conference.

9:00 – 9:30 Registration, Coffee and Muffins

9:30 – 10:30 Banker Plants, Trap Plant and Habitat Planters
Cheryl Frank, Greenhouse IPM, University of Vermont

10:30 – 10:45 Coffee Break

10:45 – 11:45 Conserving Pollinators and Natural Enemies in Our Horticulture Businesses *Kimberly Stoner, Department of Entomology, The Connecticut Agricultural Experiment Station*

11:45 – 12:45 Lunch on your own

12:45 – 1:45 It's a Bug Eat Bug World: Current Research on Biological Control
Betsy Lamb Ornamentals IPM Coordinator, Cornell University

1:45 – 2:00 Break

2:00 – 3:00 Grower to Grower
Kerri Stafford, Cavicchio Greenhouses, Mark Kelley, Grower Direct, Roger McGaughrey, Pioneer Gardens, Karen McNaughton, Mahoney's Garden Centers

What better way to end the day, than by hearing from growers who actually are using biological control, natural enemies, banker plant and habitat planters. Hear what the growers are using, how they have changed and evolved, what's working, what is not in this ever changing world of biological control for greenhouse crops.

Four contact hours for pesticide recertification have been approved.

$40 per person; $35 per person for three or more registrations from the same company. Morning coffee, refreshments and handouts included in registration.

Contact: Tina Smith, UMass Extension, 413-545-5306 or Leanne Pundt, UConn Extension, 860-626-6240

Plastic Film Update

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Polyethylene plastic has many properties that make it useful as a covering for greenhouses. Its low cost, large sheet size, ease of attachment and good light transmission are properties that have helped to expand its use so that today it is the most common glazing.

Since the early 1960's when polyethylene film was first used to cover wood frame greenhouses, many improvements have been made. Early films lacked durability and had to be replaced annually. They didn't stand up to the abrasion from the structure and the weather. They also had a short life due to deterioration from the ultra violet rays of the sun.

Most polyethylene film is manufactured as a coextrusion of three layers with different polymers and additives. Each of them contributes to the quality of the film and enhances its performance. The following summarizes some of the characteristics that you need for your crops.

Life. The life of polyethylene films is limited due to degradation processes induced by sunlight and heat. Co-poly is a low-cost material that is good for one season. It is a good choice for seasonal greenhouses, overwintering structures and high tunnels. Avoid construction grade material that has less strength. Greenhouse grade poly is warranted for 4 years or more and costs about double that of co-poly. It contains an ultra-violet (UV) stabilizer that reduces degradation. If additional strength is needed, such as windy in locations, a woven poly or nylon scrlm-reinforced material should be considered.

Thickness. One-year co-poly film is available in 3, 4 and 6 mil thickness. Three or four mil film is common for one year use on narrow tunnels and overwintering houses. Greenhouse grade material, only available in 6 mil thickness, is best for multi-year application.

Condensate control (AC). “Anti-drip” is a wetting agent that reduces surface tension allowing condensation to flow rather than form droplets. This can be sprayed on the film or incorporated in the center layer and usually lasts a couple of years. Condensation droplets reduce light transmission and can lead to disease problems when they drip onto plants. An antifogging additive may be included to prevent early morning and late afternoon fog formation in the greenhouse.

Reduced nighttime heat loss (IR). This additive raps the inside radiant heat from escaping. In heated greenhouses, the savings have been measured to total from 10-20% depending on whether the sky is cloudy or clear. In double layer poly installations, the IR film is always placed as the inner layer to retain nighttime heat. Research has shown that IR film can increase color and/or compactness and accelerated crop development. This is most likely due to increased nighttime plant tissue temperature. Costing only a couple of cents more per square foot, the payback is only a few weeks for a greenhouse heated all winter.

Reduced daytime heat gain. In areas with strong sunlight, blocking part of the infrared

spectrum can lower inside temperature up to 10°F. Selective pigments can be added to the outside layer in copolymer film to reflect or absorb the near infrared radiation which is useless for plant growth.

Research has shown that the higher the outside temperature, the larger the temperature difference achieved by use of these films. The advantages include lower cooling costs, greater worker comfort, lower irrigation needs, reduced plant stress and improved fruit taste.

Ultra-violet (UV). Bees need UV to navigate. If you are using bees to pollinate plants in the greenhouse, purchasing a film that allows some of the UV part of the light energy spectrum to pass through may be important. Otherwise, UV blocking film will reduce whiteflies, thrips, aphids and other insects. It can also control some fungal diseases.

Controlled diffusion. Light diffusion is another property that has recently been added by manufacturers. This increases the amount of diffused light that reaches the plants, reducing scorching and increasing light to lower leaves. It is especially important with tall crops such as tomatoes, cucumbers and peppers. Research has shown that diffused light also reduces fungus spore development and insect propagation.

Light transmission. Photosynthetically active radiation (PAR) light transmission varies with the type of additive in the film. Typical values are UV stabilized film 88-91 %, IR-AC film 82-87%, IR-AC with diffusion 77-88%. Dust, smog and plastic deterioration can also reduce light transmission. A "rule of thumb" is one percent increase in light equals one percent increase in plant growth during the winter or in cloudy weather. Some growers replace the plastic every year just to get a few percent higher light levels when growing plants during the short days of winter. Some manufacturers make a film with anti-static properties that repels dust, dirt and smog.

Photoselective films. These films absorb or reflect specific wavelengths of light. They can enhance plant growth, suppress insects and diseases and affect flower development. Red films such as Dupont IR and Smartlite Red film reduce PAR light and create a shading effect. They have also been shown to improve rose yield and quality.

Single or double layer poly. If you are growing during the heating season, an inflated double layer is desirable. It reduces heat loss at night by about 40%. It also reduces the stress at the attachments and the rippling of the plastic on a windy day. Air inflation at water static pressure is best. A slightly higher pressure should be used in windy or snowy weather. Connecting the blower to use outside air will reduce condensation between the two layers. Single layer is common on high tunnels and nursery overwintering houses.

Plastic failure. Early failure of poly can be attributed to attachment stress, abrasion on rough surfaces and sharp edges or heat build up in the area of rafters, purlins and extrusions. Contact with chemicals from pesticides or pressure treated lumber can also affect the life of the plastic. Poly may also be subject to cuts from blowing ice especially if there are multiple greenhouses adjacent to each other. A scrim reinforce poly may be desirable in these situations.

The high quality and long durability make today's copolymer plastic a good choice for greenhouse glazing. Make your selection from the many options that are available to enhance plant growth.

Selecting the Right Growing Media for Your Crops

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As you plan for next year's bedding plant production, it is important that you select the right growing media for your crops. Since the growing media relates to every cultural practice in the production of your greenhouse crops, it is extremely important that you select media that are best suited for your production system. Poor performance of a growing medium can be costly because it can result into poor quality, unsalable crops.

Successful greenhouse production is dependent on the chemical and physical properties of the growing medium. An ideal growing medium should have the physical properties to hold the roots and physically support the plant, and should be able to supply adequate nutrients, water and oxygen for proper root functions. The medium should be of reasonable weight depending on the plant being grown. Excessive weight should be avoided as it will hamper handling and increase the shipping costs.

In order to select the right growing media for the crops being grown a grower should have knowledge of many different components that are used to formulate the media and the physical and chemical environments created by the mix.

Growing media components and their properties

Peat. Sphagnum peat moss is the most commonly used peat in greenhouse media. Sphagnum peat moss is partially decomposed plant matter harvested from bogs across Canada. It is harvested in its natural state and transported to factories for screening and grading into various particle sizes. Peat generally has low pH and low soluble salts. It has high nutrient and water holding capacity and low bulk density. Moist peat will readily absorb moisture but when it dries out it repels water.

Bark. The most commonly bark used for greenhouse media is softwood bark (Southern pine bark or Northern soft wood bark). The bark is either aged or composted in a controlled process. Bark increases bulk density, slightly decreases water holding capacity and slightly increases air space. Bark has a pH range of 5.0-6.5 and low soluble salts. Studies have shown that composted bark has potential for impacting some disease resistance. Bark mixes may require higher fertilizer due to nitrogen draw by the bark (companies add a nitrogen source).

Coir. Coir is a natural product obtained from coconut husk while separating fiber from the husk. Coir has a pH range of 5.5-6.5 and has soluble salts higher than sphagnum peat moss and bark. Coir has lower nutrient holding capacity than peat but has very high air and water holding capacity and it also readily absorbs water.

Vermiculite. Vermiculite is a micaceous mineral expanded by heating in a furnace at 1800°F and screened in various particle sizes. It provides air space and nutrient and water holding capacity. It

also provides additional potassium, calcium and magnesium. Vermiculite tends to break down with excessive handling and poor watering practices.

Perlite. Alumino silicate mineral expanded by heating in a furnace at 1600°F and screened in various particle sizes. Perlite is a light-weight white porous material. It is used to increase air space and has no water holding capacity. It has no effect on pH or fertility of growing media.

Rice hulls. Rice hulls are the byproduct of the rice industry. They are available as fresh, parboiled or composted. Fresh and parboiled rice hulls are used as a substitute for perlite. They are light in weight and are used to increase drainage and aeration. Parboiled rice hulls are preferred because the steam pressure process is able to kill any weed seeds. Fresh rice hulls have a neutral pH, but fully composted rice hulls have a pH of 5.7 and have some water holding capacity. Both fresh and composted rice hulls have high manganese content and therefore it is important to keep pH above 5.0 to prevent manganese toxicity.

Peanut hulls. Peanut hulls can be added to growing media to provide additional large pore space because of their fibrous structure. However peanut hulls have a rapid decomposition rate (6-12 weeks) in the presence of water and fertilizer. They can be used for short term crops. If peanut hulls are used they should be pasteurized or chemically fumigated to eliminate lesion nematodes which can attack many ornamental crops.

Limestone. Limestone is added to growing media to adjust the pH of acid components of the growing mix upwards. Calcitic limestone is the most common because it is fast acting and has higher calcium content. Dolomitic limestone is slow acting and may be added to provide long pH stabilization for longer term crops.

Wetting agents. These are non-ionic surfactants added to growing media to improve water infiltration into the media. Some components of the growing media such as sphagnum peat moss and bark are difficult to hydrate when dry because they tend to repel water when dry. For organic growing media, organic wetting agents made from extracts of plants such as yucca are added. Organic wetting agents are less efficient for initial penetration of water into growing media than synthetic agents. They also have shorter shelf- life when the mix is stored.

Starter fertilizer. Starter fertilizers are added to growing media to provide phosphorus and nitrogen (no potassium) to the seedling for healthy growth. The starter fertilizer concentrates phosphorus near the limited root system of the seedling for healthy growth of the roots. The nitrogen in the starter fertilizer provides the seedlings with nutrients for lush green growth. For organic growing media organic soy-based natural starter fertilizers are added.

Choosing the right growing mix

There are two options when considering greenhouse growing media. You can mix your own or you can buy premixed. To mix your own, you need to have a thorough understanding of the physical and chemical properties of each component. Mixing your own growing media also requires knowledge

and experience of the right ratios of each component and expensive mixing equipment. This is difficult for most growers.

Purchasing premixed growing media is the most common practice for most growers. Suppliers offer mixes formulated to meet different production needs and in various package sizes. Suppliers can also offer custom blended growing media to meet demands for your specific operation. Avoid media that are excessively mixed, fluffed or compacted.

The choice of growing media should be based on crop need, management practices, container size and physical and chemical properties of the mix. Before switching to a new growing medium, test the it to determine its suitability for your production system.

Management practice. For germination in small plug trays you need a well-drained porous medium such as a blend of short fiber sphagnum peat moss and fine grade perlite or rice hulls. Addition of vermiculite will increase porosity and water retention. For germination and growing seedlings in plug trays you need less porous medium blend of peat and vermiculite. For initial slow growth and better initial control especially for plugs and cuttings, you need a blend of peat and perlite with low fertilizer charge. For fast initial growth such as vegetable transplants a blend of peat and fine grade vermiculite with a high fertilizer charge is a good choice. For root sensitive crops that don't like to be overwatered you need a high porosity media blend of peat and perlite or low water holding media blend of peat, bark and perlite.

Container size. For plug trays you need a fine textured medium that is porous, well-drained and low nutrient charge. For cell packs you need a medium that is well drained and has good water and nutrient holding capacity. For 4-8 inch pots you need a coarse texture medium, and for hanging baskets and large pots you need a coarse or extra coarse medium.

Chemical properties. For iron inefficient (prone to iron deficiency) crops such as petunias you need low pH media with reduced lime content. For iron efficient (prone to iron toxicity) crops such zonal geraniums you need a higher pH medium with increased lime content. For heavy feeder crops such mums a you need a higher CEC medium that incorporates bark or coir.

Other growing media choices

Organic growing media. There are OMRI listed organic greenhouse mixes available from media suppliers. These are blend of sphagnum peat moss and perlite or sphagnum peat moss, composted bark and perlite mixes. Others include coir in the mix. Additional components of organic media include dolomitic limestone for long term pH stabilization; soy based organic starter fertilizer nutrient charge and organic wetting agents.

Growing media with mycorrhizae. Endomycorrhizal fungus is added to some media and it benefits the plants by improving acquisition of water and nutrients (especially phosphorus). The mycelium of the mycorrhizal fungus grows in association with the plant root system and increases the absorptive area for nutrients and water.

Growing media with biofungicide. *Bacillus subtillis* bacterium is added to some media and it helps to reduce the incidence of root diseases (*Fusarium, Pythium, Rhizoctonia*) to improve the growth of the plants.

Disease and Pest Management in the Landscape Seminar

The University of Connecticut Cooperative Extension and the Northeast Division of the American Phytopathological Society are sponsoring "Disease and Pest Management in the Landscape" to be held on **October 25, 2013** at the Heritage Hotel in Southbury, CT.

This ½ half day educational seminar from (8:00 am to 12:30 PM) will feature a number of regionally recognized speakers. Topics were selected to appeal to the landscape and horticultural professional.

> Ann Gould from Rutgers Cooperative Extension will be speaking on *Diseases in the Landscape: Top Five in 2013*
>
> Richard Cowles from the CT Agricultural Experiment Station will be speaking on *Insect Pests: Choosing Appropriate Management Tools*
>
> Victoria Smith and Sharon Douglas from the CT Agricultural Experiment Station will be speaking on *Two-Years Later: The CT Boxwood Blight Experience*
>
> Randall Prostak from University of Massachusetts will be speaking on *Managing Some Common Landscape Weeds*
>
> Joan Allen from the University of Connecticut will be speaking on *Organic Control of Pests & Diseases in the Landscape*

A registration fee of $60 is due by **October 21st** payable by *check only* to the University of Connecticut. Early registration is encouraged. Included in the cost of admission: coffee, continental breakfast, and informational handouts. Pesticide recertification credits will be offered for attendees in CT, RI, MA, ME, NH, VT and NY (pending state approval).

For more information contact: Leanne Pundt at leanne.pundt@uconn.edu or call 860-626-6855 or visit the website: http://ipm.uconn.edu (Look under workshop in the Turf and Landscape program). Or Click here for the registration form.

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