

Floral Notes *Newsletter*

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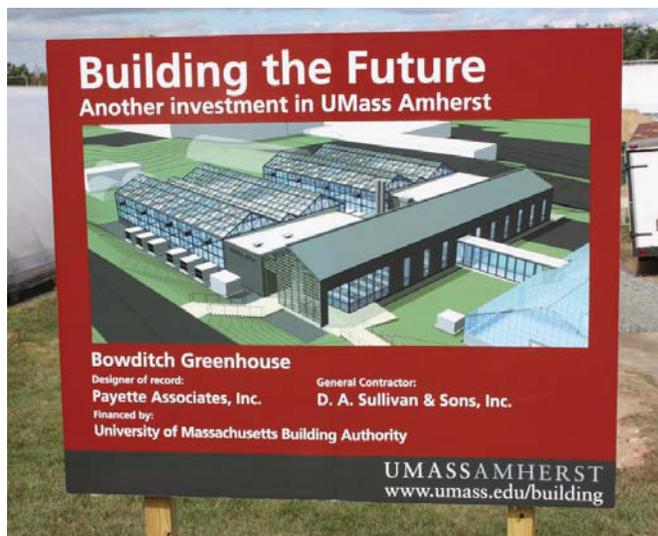
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Shelled Corn for Heating Greenhouses and Crops for Unheated High Tunnels

Twilight Meeting, October 21, 2010, 4:00 - 6:30 PM
Indian Head Farm, 232 Pleasant St., Berlin, MA

Indian Head Farm installed an Amazing Heat corn furnace in 2009 and has burned shelled corn to heat the greenhouse used for starting spring seedlings. This summer he constructed a 26 X 96 ft unheated high tunnel (hoop house) with financial support from NRCS. Join us at this twilight meeting to see how a corn furnace can heat your spring greenhouse using locally grown shelled corn. You will also see the new high tunnel and learn about growing mixed greens, small fruits and cut flowers in high tunnels. For more information visit: http://www.umass.edu/umext/floriculture/upcoming_events/index.html or contact Tina Smith, UMass Extension Greenhouse Crops Program 413-545-5306, tsmith@umext.umass.edu.

Sponsored by UMass Extension Agriculture and Landscape Program



New Greenhouse Construction Begins

At UMass you know it's serious when the authorities put up a pretty sign heralding the new project! As of mid-September excavation work had been completed including accommodations for utilities. Foundations have been poured for the headhouse and shortly steel will arrive for framing. Once the headhouse is well underway construction of the Stuppy greenhouse will begin, about mid-winter. If the project stays on schedule the new complex will be ready for use by late summer 2011.

University of Massachusetts, United States Department of Agriculture and Massachusetts counties cooperating.
The Cooperative Extension System offers equal opportunity in programs and employment.

Tightwads and Tree-Huggers: Marketing to the Post-Recession and Eco-Consumer

I was fortunate to have the opportunity to moderate at the Great Ideas Summer Conference held in July. Here are a few highlights from part of a presentation by Dr. Kristin Getter, Michigan State University. *Tina Smith, University of Massachusetts Extension*

Marketing to the Post-Recession Consumer was part of a talk by Dr. Kristin Getter, Michigan State University, a featured speaker at Great Ideas, Summer Conference in July. Kristin spoke about the results of two national marketing studies. In the first study Dr. Getter spoke about the various consumers and how they have responded to the recession.

Kristin pointed out that there are “steadfast frugalists” that account for 1 in 5 people and 3 in 5 are women. These frugalists consist of people of all ages, but more are likely older consumers. They are self-disciplined spenders strict on their own behavior and committed to self restraint. These customers are a challenging target for all businesses and need to be shown the value of a product.

Another group are “involuntary penny-pinchers” and they make up 1 in 3 people and 3 in 5 are also women. Although this group consists of people of all ages, more are in the 30-40 age group with a household income of \$50,000. This group has been hit hardest by the recession, both financially and emotionally. The new frugality was forced on them by economic changes and they didn’t save enough. This is also a tough target due to few resources available.

A third group are “pragmatic spenders” and make up 1 in 3 people with 3 in 5 being men. This group consists of people ages 60 or older and with household incomes greater than \$75,000. This group spends cautiously and has cut back, re-evaluating what is truly important and necessary. They have the greatest capacity to weather a recession and are attractive to businesses since they have more resources.

The final group identified in the study was the “apathetic materialist”, which make up 1 in 5 people with slightly more men. This is a younger group with most age 20-29. This

group is the least changed by the recession, financially and emotionally, and are an attractive market for businesses.

So the take home message for this study was that people responded differently to the recession and their responses have affected all industries including horticulture. Retailers can learn from their response how best to approach and connect with these new attitudes about spending and saving.

As a result of this study, Kristin offered some marketing suggestions. It may be a good time to increase prices on non-comparable items or items where shoppers are not likely to compare prices at other stores. Price can communicate value so be sure that value over-rides price. She advised to plan carefully for sales and discounts as they will be in higher demand in 2010 and beyond.

According to the study, customers do compare prices. More common products will be price checked, so Kristin advises to carry a larger or smaller size so customers can make a direct comparison when shopping at other stores. Larger sizes at similar prices create more value in the eyes of the consumer. Smaller sizes may be perceived as a “better deal”. Show that your product is a better value. Is there something unique or different about it? Sit the competitors product next to your – see the difference.

Most consumers buy on sale or use coupons. Kristin went through an exercise with the audience looking at a chart on the effects of discounts on profits. Do you know what the effect of discounts on your profits? If a product is being sold for given price, how many units do you need to sell to break even or achieve a certain amount of profit. Now, if that same item was being sold for 10% off, 20% off, or more, how many units would need to be sold to break even or achieve the same amount

of profit. Can you sell enough product at a given discounted price to make a profit?

According to the study, most consumers are taking a longer time to evaluate and decide purchases. Kristin advised that more displays and customer help may inspire them to see the value in a purchase. Display unique groups of merchandise that other stores may not have, to give them great ideas and use educational displays to show how to use products. Kristin used an example of how an educational display

can show the value of plants to reduce a homeowner's cooling bill, provide privacy, improve the value of their home or provide inexpensive food. We talk about plant features all the time like flower color, and whether a plant is an annual or perennial, but we rarely highlight the benefits like lowering bills, privacy, food production and environmental enhancement. Value is what you get (benefits) for what you pay (price). Emphasize this relationship now, more than ever.

2010 UMass Extension Shelled Corn for Greenhouse Heat Program

Agricultural Innovations Project, 2008-2011

Andy Cavanagh, UMass Extension Vegetable Program

Interested growers are invited to participate in a project that will increase energy independence, support local agriculture, and insulate participating growers against the kind of drastic increases in fuel costs that we saw just a few years ago.

This is the last year of a project that is exploring the economic and environmental feasibility of using locally grown grain corn as fuel for heating greenhouses. Growers who participated in 2008-2010 found that the furnaces they installed were cost efficient, reasonably simple to set up and use, and did an excellent job of reducing or eliminating the need for supplemental heat in their greenhouses.

Our goal is to foster a regional network of renewable energy producers and users with a focus on grain corn but also including other types of renewable energy. The emphasis of this project is on making the best possible use of our land for food and fuel production and not to detract from our ability to grow food crops. We're envisioning a system where fuel crops become a valuable rotational crop in vegetable farms and an alternative revenue stream for dairy farmers in a time of shrinking demand for silage; not a system in which the production of fuel shifts acreage away from food production.

We would like to find farms that represent a range of vegetable and floriculture businesses in Massachusetts and various types of greenhouse designs, crops and heating needs. We have funding to provide cost-share for purchase of one corn furnace or boiler per farm (up to 50% of the cost, maximum \$3000 per farm) for a limited number of farms. Although we may not be able to provide cost-share funds for all growers who are interested, we will be able to provide useful information and contacts to all interested growers.

If you are interested in applying to be a part of one of these regional networks and receiving cost share for the purchase of a biomass furnace please complete and return the application form. For more information, contact Tina Smith, 413-545-5306, tsmith@umext.umass.edu. **Application Form:** <http://www.umassvegetable.org/documents/CornFurnaceprojectapplication.pdf>

Funding for this project has been provided by the Mass. Dept of Agricultural Resources and the University of Massachusetts College of Natural Resources and the Environment.

Forcing Strategies for a Late-date Easter

Richard McAvoy,
Professor and Extension Specialist – Greenhouse Crops
Plant Science and Landscape Architecture
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Storrs

Easter 2011 falls on April 24, one of the latest dates possible. As you know the Easter date varies annually based on specific astronomical events. According to the rule proclaimed in Niceea (Bitinia, Minor Asia) in the year 325 A.D. the Easter date falls “*On the Sunday which follows the 14-th day of the Moon which reaches this age on 21 March or immediately after that*” (e.g. Levy, 1974). “The 14th day of the Moon” refers to 14 days after the new moon or the first full moon after the spring equinox. The Easter date can be as early as March 22 or as late as April 25, but you will have to wait until the year 2038 for Easter to fall on a date as late as this year.

Under ideal circumstances programming of the Easter crop begins 23 weeks before Easter to allow adequate time to fully cool and force the crop for maximum quality. This season, growers receiving bulb shipments in mid- to late-October will find that they have an extra 2-4 weeks in their schedule. The key question for 2011 is ‘*how should I handle the extra time and still produce a quality crop?*’ The other big problem with late date Easters is that the crop will be tying up bench space deep into the spring bedding plant season.

There are several ways you can use the extra time. First, the 2011 Easter lily schedule projects lilies for sale one week before Easter. However, most growers begin shipping lilies two weeks before Easter. Natural variation in date of lily maturity usually produces enough early bloomers to meet this demand without changing the basic schedule but if you wish to bring the bulk of your crop in earlier just adjust each step in the schedule back one week.

The second opportunity to use some of the extra time is during the 6 week cooling or vernalization period. Bulbs need to accumulate 6 weeks (or 1000 hours) of cooling at 40-45F to be properly vernalized but too much cooling (more than 6 weeks) will hasten finishing time, and reduce both leaf number and bud count. However, you can prolong the cooling period without these adverse effects by following this procedure: Start cooling at 40-45F as normal. After 4-5 weeks of normal cooling, drop the temperature to freezing or slightly above (32-34F). The near freezing temperatures will suspend normal metabolism putting the bulbs in a near dormant phase, during which additional vernalization will not occur. You can hold at this temperature for 2-4 weeks if necessary. Once enough time has passed to put you back on schedule just return to 40-45F for the remainder of the 6 week vernalization period. A word of caution when using this technique, temperature must be carefully monitored and controlled. A light freeze of 32F will not harm the bulbs but a hard freeze will.

The third opportunity to use extra time will come during initial bud set. Growers can increase bud set by dropping greenhouse forcing temperatures for 7-14 days following primary bud initiation. The cool temperatures have the added benefit of slowing the rate of crop development. I have recommended this technique with previous late-date schedules and growers continue to report very good results. If you plan to do this, you need to start greenhouse forcing of case-cooled lilies 19 weeks before Easter rather than the normal 17 weeks, or start greenhouse forcing of pot-cooled lilies 16 weeks before Easter rather than the normal 14 weeks. Run the greenhouse at 60-62F until primary buds initiate (about week 16). Once primary buds are set, lower greenhouse temperature to 46F for up to 14 days to stimulate secondary bud formation. After this period, raise the temperature to 60-62F until bud initiation is complete. If you start greenhouse forcing just one week ahead of schedule, limit the duration of the 46F cool period to 7 days.

Timing of the 46F treatment is critical. It must start with primary bud initiation, which coincides with stem root initiation (early to mid-January 2011). The best way to tell when bud initiation has started is to dissect some lilies and look, but this requires strong magnification to view the anatomical changes in the shoot tip. By comparison, stem roots are easy to view and bud initiation typically starts just as stem roots begin to emerge. You must determine when primary bud initiation occurs to achieve the desired effect. Flower bud initiation may be adversely affected or delayed by temperatures that are lowered before bud initiation starts. In contrast, temperatures lowered after bud initiation is complete will have no effect on bud count but will slow lily growth.

After bud initiation, use temperature to control the rate of lily development at any stage of greenhouse forcing. This year you will want to run cool temperatures (63-65F) early in the season since outdoor temperatures will probably force development very fast during the last month of the season. Both the leaf unfolding rate and the rate of flower bud elongation can be increased or decreased with temperature. For example, at 72F the typical leaf unfolding rate is 2 leaves per day, but at an average daily temperature of 63F the rate decreases to 1.5 leaves per day. Likewise, a lily will go from visible bud to bloom in 31 days at 70F but it will take an additional week at 60F. If you can control temperature within these limits you should be able delay finish without sacrificing quality.

Finally, plants that reach the puffy white bloom stage early can be held in a cooler (at 35-45F) for up to two weeks. Growers with adequate cooler capacity may want to bring plants in early just to free up bench space for spring. I recommend the use of a Fascination or Fresco spray on lilies held in cool storage for 7 days or more. Apply 100 ppm spray over the top of the crop just before starting storage.

With naturally cooled lilies follow the CTF schedule, but remember your ability to control temperature during vernalization is limited. Therefore you may not be able to hold the pots at 32-34F to delay vernalization. However, if these temperatures occur naturally you need to factor them into your schedule. Once vernalization is complete, reassess your schedule. If you have extra time, use temperature to increase bud count and to control the rate of crop development as previously described.

As always extremely early and extremely late Easter dates are the most challenging. With Easter 2011, you will need to plan how to use the extra time. Since lilies with high bud counts are most desirable and crops forced at cool temperatures are always the best quality, I recommend you use most of your extra time here. If you choose to extend the vernalization period, I recommend that you use no more than half of the available time here. The other wild-cards with any lily crop are the uncertainty of local weather patterns during greenhouse forcing and the state of bulb maturity when they are dug from the field. Therefore, think about the temperatures you might expect in April at your location to help plan your schedule. As for bulb conditions, an early leaf count will help you assess the best greenhouse forcing strategy to finish your crop.



Figure 1. This 2010 Easter lily crop was grown in a sub-irrigation trough system. The crop is at the end of the bud initiation stage. This is the time to get an initial leaf count and plan the rest of your forcing schedule.



Figure 2. The 2010 crop about 2 weeks before Easter. Lilies at this stage are ready for early orders or cool storage.

2011 EASTER LILY SCHEDULE

Weeks Prior to Easter	Date	Forcing method	
		Case-Cooled	Pot-Cooled (CTF)
27-26	Oct. 17-24	Bulbs dug, shipped & in hand by mid- to late-Oct. Programming starts immediately. See Notes on next page & accompanying article for details.	
25-23	Oct. 31-Nov. 14	Start bulb programming as soon as bulbs arrive but no later than 23 weeks before Easter.	
20	Dec. 5	Cool at 40-45F for 6 weeks	Pot and allow roots to grow at 60-62F for 3 weeks
19-17	Dec. 12 - 26	---	Cool at 40-45F for 6 weeks
14	Jan. 16	Pot no later than 17 weeks before Easter Force in greenhouse at 60-62F in pot.	---
13	Jan. 23	Shoots emerging & buds beginning to set. Start fertilizing & keep moist. Early plantings emerge sooner & bud initiation may be already nearing completion. After bud initiation has begun, run 46F for up to 14 days to increase bud count but only if lily programming started early (before week 23). See accompanying article for details.	
12	Jan. 30	---	Force in greenhouse at 60-62F in pot.
11	Feb. 6	1-2" tall. Keep lilies moist & use fungicide drench as needed. Bud initiation coincides with stem root development.	
10	Feb. 13	2-3" tall. Run 60-62F day/ night during bud initiation. Begin leaf counting as soon as bud set is complete.	
9	Feb. 20	3-4" tall. Apply growth regulator when 3-5" tall. Repeat leaf count on late batches of lilies. Maintain temperature below 65F until bud initiation is done.	
8	Feb. 27	Use leaf counting and temperature to control the rate of lily development. Use graphical tracking and DIF to control lily height. Keep house cool if ahead of schedule.	
7	Mar. 6	5-6" tall. Adjust temperatures as needed. Space lilies to avoid yellow leaves & stretching.	
6	Mar. 13	Check for aphids & root problems. Apply Marathon sometime during weeks 10, 9, or 8. Soil test & if leaf scorch is evident, use calcium nitrate for balance of schedule.	
5	Mar. 20	7-8" tall. Lilies are about half final height. 42 days to sale. Buds can be felt. If buds are visible on early planting run 60F until finish.	
4	Mar. 27	35 days to sale. Buds should be visible no later than 30 days prior to sale. Grade for uniformity as buds become visible. Apply Fascination or Fresco if leaf yellowing seen, or, if cooling is anticipated.	
3	Apr. 3	Buds ½-1" long.	
2	Apr. 10	Buds 1-1½", some bending down.	
1	Apr. 17	Buds 1½-2" long. If aphids present, use a total release smoke or aerosol.	
0	Apr. 24	Buds 2-4" long., some turning whitish. Stop fertilizing just prior to sale & apply clear water once. Cool lilies at 35-45F to hold. Apply Fascination or Fresco before starting cold storage.	
	Apr. 17	Ready to sell. Shade lilies immediately after they are removed from storage.	
	Apr. 24	Easter 2011	

NOTES & COMMENTS ON THE 2011 EASTER LILY SCHEDULE

Easter 2011 outlook: Easter falls on a very late date in 2011 (April 24). Most growers will have extra time in their forcing schedule. You can use some of the extra time by interrupting vernalization with 1-2 weeks of near freezing temperatures or use the time to increase secondary bud initiation or grow cool to extend the greenhouse forcing period. Adjust your schedule according to plant growth, bud development, starting time, and past experience. If you have problems contact your Extension Educator.

Pot-cooled bulbs are normally potted & held for three weeks at 60-62F before the six weeks of bulb cooling (at 40-45F) begins (see the 2011 Easter Lily schedule for details). The bulbs then require 14 weeks of greenhouse forcing. This entire process requires 23 weeks from initial potting to Easter. This same process is used for both naturally cooled or CTF bulbs.

Case-cooled bulbs require six weeks of cooling followed by 17 weeks of greenhouse forcing to flower in time for Easter. Be sure that commercially case-cooled bulb arrive & are planted by Dec 26, 2010. If you cool your own bulbs, start as soon as bulbs arrive but no later than Nov 14, 2010 (23 wks before Easter).

Insurance lighting: Do not use insurance lighting this year. You will have adequate time to accomplish 6 weeks of cooling.

Fertigation: Start fertilizing with soluble formulation when lilies emerge and continue to within 7 days of sale. Combine calcium nitrate (3 parts) with potassium nitrate (2 parts) to make a 15-0-18 soluble fertilizer, or use a commercial 15-0-15 formulation. If phosphorus was not added to the medium, 20-10-20 can be used on an alternating basis with a 15-0-15. Fertilizer rates should range from 200-400 ppm. Do not allow medium EC to exceed 3-3.5 mmho/cm based on a Saturated Media Extract. Stop fertilizing just before sale. Provide one clear watering before shipping lilies - this will reduce salt levels in the potting medium and maximize keeping quality. Do not withhold water or fertilizer to slow development. Do not over water (i.e. water too frequently) or root rot problems may occur.

Decrease Leaf Yellowing & Delay Flower Senescence: To prevent early-season leaf yellowing (7 to 10 days before visible bud) & mid-season leaf yellowing (7 to 10 days after visible bud) spray Fascination at 10/10 ppm. (Note: Fascination contains two active ingredients and recommendations include the concentration of each). Apply only to lower leaves & cover thoroughly. To prevent late-season leaf yellowing and post-harvest flower senescence, spray 100/100 ppm to thoroughly cover all foliage & buds. Apply when buds are 3 to 3 1/2" long BUT NOT MORE than 14 days before shipping or cooling. Protects leaves from yellowing for up to 14 days. Note: Avoid direct contact of spray to immature leaves during early- & mid-season applications or increased stem stretch will result.

Disease and pest control: Before planting, clean bulbs of debris removing any damaged scales, especially scales that show evidence of infection. Once potted, root rots associated with *Rhizoctonia*, *Fusarium*, and *Pythium* are a concern. Drench immediately with Banrot or Insignia, broad-spectrum fungicides, or you can treat to control these diseases separately by selecting from the fungicides specifically registered for *Rhizoctonia*, *Fusarium* and *Pythium* control on lily. Materials registered for *Rhizoctonia* and/or *Fusarium* include 26GT, 26/36, Contrast (*Rhizoctonia*), Sextant, and Terraclor WP (*Rhizoctonia*). Materials registered for controlling *Pythium* include Alude, Banol, Subdue Maxx, and Truban. Check with manufacturers regarding compatibility when tank mixing fungicides for *Pythium* with *Rhizoctonia/Fusarium* controlling materials. Fungicides may need to be re-applied later in the crop, check labels for guidance.

Aphids, fungus gnats and bulb mites are a major concern. Use only aerosols once in bud. Many chemicals are listed for aphid control, including, Safari, Celero, Flagship, Tristar, Marathon, DuraGuard, Distance, Enstar II, Preclude TR, Tame, Ultrafine Oil, Insecticidal Soap, Talstar and Endeavor. Fungus gnats can be controlled with many of these same chemicals as well as Citation, Adept, insect parasitic nematodes (Nemasys, NemaShield, Scanmask) and Gnatrol. Bulb mites, *Rhizoglyphus robini*, represent one of the more troublesome insect pests on lilies. Duraguard is labeled as a drench for soil borne organisms that may include bulb mites. Bulb mites are more likely to attack physically damaged bulbs – so be sure to control fungus gnats and handle bulbs gently.

Note: Registration of pesticides varies by state so consult and follow labels for registered uses. To avoid any potential phytotoxicity or residue problems, spot test first before widespread use. No discrimination is intended for any products not listed.

Controlling Lily Height: Use A-Rest, Chlormequat E-Pro, Concise, Cycocel, Topflor or Sumagic as needed when shoots are 3-5" tall. Split applications provide the best results. You can apply any of the PGRs at 1/4 to 1/2 normal rate as needed, to control height. Reduce the concentrations of Sumagic used when combined with DIF. Use DIF, or cool morning DIP, to control lily height. Equal day/night temperatures, high night/low day temperatures or a cool morning temperature dip will keep lilies short.

Lily storage: Lilies can be stored for up to 14 days in the dark at 35-45F when buds turn white but before they open. Spray for Botrytis control prior to moving lilies to cold storage. Materials registered for botrytis control on lilies include 26GT, 26/36, Daconil, Exotherm Termil, Sextant, and Protect DF. Follow label directions. Water Easter lilies thoroughly before starting cold storage. After removing from the cooler, place lilies in a shady location to avoid excessive wilting.

Graphical Tracking of Lily Height: Monitor lily height regularly during forcing. If height exceeds the target size, run negative DIF to slow stem elongation. If height is less than the target size, run positive DIF to increase stem elongation.

All agrichemical/pesticides listed are registered for suggested uses in accordance with federal and Connecticut state laws and regulations as of the date of printing. If the information does not agree with current labeling, follow the label instructions. The label is the law. Contact the Connecticut DEP for current regulations. Where trade names are used for identification, no product endorsement is implied nor is discrimination intended.

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