

Scheduling Tips for the 1998 Easter Lily Crop

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Easter falls on April 12 in 1998; this is considered a late mid-date Easter. With a late mid-date Easter, you will have extra time in the schedule that can be used to increase bud count. Growers need to start bulb programming no later than November 2 or 23 weeks before Easter. However, if lilies arrive before this date, and they probably will, start your bulb programming right away and use the extra time to increase bud count later in the crop.

With late mid-date or late-date Easter's, lilies are often stressed from long storage, crowding on the bench, or problems with nutrition. These conditions can lead to leaf yellowing. To avoid leaf yellowing, pay attention to proper culture all throughout the crop and use a cytokinin spray to inhibit leaf yellowing. The cytokinin benzyladenine is a plant growth regulator that can be purchased under the trade names Accel and Promalin. Recent studies have shown that a single application of 100 ppm benzyladenine from Accel or Promalin can prevent leaf yellowing in Easter lily. Apply the spray before leaf yellowing occurs, typically between week 7 and week 5 or about the time of visible bud. Both Accel and Promalin contain a second growth regulating compound called GA that can increase stem stretch (Promalin has 10 times more GA than Accel). Therefore it is important that you apply the spray to just the lower portion of the stem and that you cover the surface of all the leaves on the lower stem. Any portion of the leaf that is not covered by the spray will still yellow creating a mottled or uneven color pattern. Therefore it is very important that the spray coverage is uniform over the entire treated area.

Using temperature to increase bud count: Bulbs dug in late-September to mid-October will be shipped to bulb growers 24 to 25 weeks before Easter. This is early for Easter 1998. Normally, bulb cooling starts about 23 weeks before Easter to provide adequate time for greenhouse forcing (17 weeks for case-cooled bulbs and 14 weeks for pot-cooled). This year growers must

choose how they will use the extra time.

One option is to begin cooling the bulbs at recommended temperatures (Ace at 35°F to 40°F, Nellie White at 40°F to 45°F and 40°F for mixed lots). After four weeks, drop the temperature to 32°F to 34°F. This will slow vernalization, so that the bulbs can remain in the cooler beyond the normal six weeks without perceiving more than 1000 hours of vernalization. If you choose to use this method, make sure bulbs do not freeze.

A second option is to run cooler than normal temperatures after primary bud initiation begins. The cool temperatures will stimulate secondary bud formation and also slow lily development. With this technique, vernalize bulbs as you normally would, then move the bulbs into the 60°F to 62°F greenhouse 18 to 19 weeks before Easter. Once the primary buds begin to initiate, lower greenhouse temperature to 46°F for Nellie White, 55°F for Ace, or use 50°F for mixed lots. Maintain these temperatures for seven to 10 days to stimulate secondary bud formation. After this period, raise the temperature to 60°F to 62°F until bud initiation is complete.

Timing of the cool temperature treatment is critical. It must start with primary bud initiation, which coincides with stem root initiation or when shoots reach 3 to 5" high in mid- to late January 1998. The best way to tell when bud initiation is starting is to dissect some lilies and look. This is not easy since you will need a magnifying lens to view the anatomical changes in the shoot tip. By comparison, stem roots are relatively easy to view. When the roots just begin to break out of the stem (1/8") that is a sign that bud initiation is starting. You will need to determine when the primary buds initiate. If the temperature is lowered before bud initiation starts, flower bud initiation may be adversely affected or delayed. If the temperature is lowered after bud initiation is complete, it will have no effect on bud count but it will slow lily growth.

The 1998 Schedule

Use the 1998 Easter Lily Schedule as a guide for planning the Easter crop. Final crop height and crop timing will depend on how you manage the crop. The following tips, along with the 1998 schedule, will help you make informed management decisions.

Bulb handling: Bulb mites (*Rhizoglyphus robini*) were a problem in past years and are always present on lily bulbs. Control bulb mites by soaking bulbs in Kelthane (2 oz/10 gal.) or Dursban (8-16 oz/100gal) for 30 minutes. Or, after bulbs are potted, apply Oxamyl 10G (1/4 - 1/2 tsp/pot) after planting.

Bulb cooling: Bulbs are programmed by cooling them either in the case or the pot. Pot-cooling can be done naturally or in a controlled temperature cooler (called CTF). Alternatively, commercially case cooled bulbs can be purchased later in the season. Bulb cooling or vernalization must precede flower initiation. The number of hours bulbs are held at vernalizing temperatures will affect both the number of days to flower and bud count. As vernalization time increases, forcing time decreases at the expense of bud count. The tradeoff for the grower involves rapid forcing at the expense of bud count!

Easter lilies forced from pot-cooled bulbs produce higher bud counts, more leaves and longer leaves toward the base of the stem than do case-cooled bulbs. For both CTF and natural cooling, treat bulbs for bulb mites and pot immediately. Keep the potting medium moist so that bulbs perceive the cold. For CTF, maintain 63°F for three weeks. Make sure bulbs get the full three weeks so that adequate root development occurs, there's plenty of time for this in the 1998 schedule. Good root development during this period will result in higher bud counts later.

After rooting, pot-cool bulbs for 1000 hours (six weeks). Cool Ace at 35°F to 40°F and Nellie White at 40°F to 45°F, or run 40°F when both cultivars are cooled together. Monitor bulb temperature using several thermometers placed in the potting medium next to bulbs. Record the temperature each day and adjust thermostats to maintain optimal temperatures. If lily shoots emerge in the cooler, provide fluorescent lighting at 10 fc. Do not over cool.

Start 1000 hours of natural pot-cooling once bulbs are potted. Do not allow bulbs to freeze and do not include hours above 50°F in the total cooling hours accumulated.

If you case-cool your own bulbs, start six weeks of cooling (1000 hours) as soon as the bulbs arrive. Check the peat used to pack bulbs. It must remain moist for bulbs to perceive the cold treatment! As with CTF, cool "Ace" at 35°F to 40°F and "Nellie White" at 40°F to 45°F and do not over cool.

If using commercially case-cooled bulbs, they should be potted and in the greenhouse no later than 17 weeks before Easter.

Greenhouse forcing: Greenhouse forcing begins as soon as the 1000 hours of cooling is complete. If case-cooled bulbs have sprouted, plant the bulbs sideways with the shoot in the center of the pot. Plant bulbs deep to stimulate stem roots. Raise bulb temperature to 60°F-63°F. Do not allow bulb temperature to reach or exceed 65°F as some of the cooling effect will be lost. Insurance lighting won't be required on the 1998 crop.

Crop timing and forcing temperatures: Begin using the leaf counting technique to track lily development when bud initiation is complete. This will allow you to adjust the rate of lily development by changing temperature. Run lower average daily temperatures if lilies are ahead of schedule, or higher temperatures if behind schedule. Begin to assess crop development early so that temperature extremes can be avoided later. Typical leaf unfolding rates vary from approximately one leaf/day at 53°F to 1.5 leaves/day at 63°F, 2 leaves/day at 72°F and 2 1/2 leaves/day at 82°F. Forcing temperatures between 55°F to 70°F produce the highest quality lilies and are most fuel efficient.

Once buds become visible at about 30 days before sale, you can use a bud stick to time the crop. From visible bud to flower takes about 30 days at 70°F and 35 days at 65°F.

Uneven greenhouse temperatures produce uneven crop development. Use horizontal air flow to equalize temperatures. If a small group of lilies is slow, a plastic tent over a bench with bottom heat will keep plants warmer without affecting the rest of the crop. Open the tent if the temperature goes above 80°F. Be especially sure to maintain adequate soil moisture and humidity levels during high temperature forcing or lily development may stall.

Height control: Lily heights listed on the 1998 schedule are designed to yield a final lily height of about 16 to 18 inches. Some growers may prefer shorted lilies and some may prefer taller lilies. Growers should adjust the targeted height at each week of development accordingly.

DIF can be used with some growth regulators like A-Rest but do not use DIF with Sumagic. A-Rest and Sumagic should be applied when shoots are 3 to 5" tall. DIF can be used throughout the crop, once bud initiation is complete.

Media, fertilization, and irrigation: Mix and test your potting medium before bulbs arrive. If low in phosphorus, incorporate up to three pounds of superphosphate per cubic yard. If leaf scorch has been a problem in the past do not add superphosphate, instead use a water soluble phosphorus fertilizer formulation and maintain the pH in the 6.5 to 7.0 range. If the pH is in a good range but calcium is low, incorporate gypsum at two to four pounds per cubic yard.

Start fertilizing with a soluble formulation when lilies emerge and continue until one week before sale. Use a 15-0-15 fertilizer formulation or make your own with a combination of three parts calcium nitrate and two parts potassium nitrate as the base fertilizer (a 15-0-18 formulation). If phosphorus was not added to the medium, use a 20-10-20 formulation on an alternat-

ing basis with a 15-0-15 formulation. Fertilizer rates should range from 200-400 ppm. Do not allow medium EC to exceed 2 mmho/cm based on a 1:2 soil:water extract (i.e. Spurways analysis) or 3.5 mmho/cm based on a Saturated Media Extract.

Do not attempt to slow lily development by withholding water or fertilizer, or poor crop quality will result. Do not over water (i.e., water too frequently) or root rot problems may occur.

The Easter lily crop represents a new challenge each year because of seasonal variations in both the schedule and the condition of bulbs coming out of the field. It's still too early to assess bulb crop quality, so you should look to the bulb suppliers for this information when the bulbs arrive. Regardless, with the 1998 crop growers should concentrate on maximizing bud count and on maintaining good leaf color throughout the crop.

