
Scheduling the 1999 Easter Lily Crop

Richard J. McAvoy

*Associate Professor and Extension Specialist –
Greenhouse Crops.*

In the El Niño year of 1998, growers across the nation experienced abnormal weather conditions. In the northeast, abnormally high light and high temperature conditions started in winter and continued on into early spring. As a result, the lily crop came in too tall and too early for many growers. If we experience the opposite conditions in 1999 with a La Niña year, growers may well find themselves struggling to keep up. And there will be not as much time to spare this year since Easter falls on April 4 in 1999. Easter holidays

that fall between April 3 and April 15 are classified as mid-date Easters. Mid-date Easters are generally good for lily growers because they afford adequate time for proper cooling and forcing without adding a lot of extra time to hold the crop. But, with Easter falling on the early end of the mid-date interval, weather conditions that delay lily development could be a problem.

Of course no one knows what the weather will bring between October and April so we must plan for a normal schedule and be ready to make adjustments as needed. Bulb programming should begin no later than 23 weeks before Easter or Oct. 25. With this schedule, lilies should be ready for sale one week before Easter. Many wholesalers begin shipping some lilies two weeks before Easter. If this is the case for you, just move your starting date back one week. Regardless of finishing date, start bulb programming as soon as bulbs arrive. Typically, bulbs are dug and shipped between late September to mid-October and should arrive at the greenhouse by mid-October. But as with everything agricultural, the exact timing of these events will be heavily dependent on weather.



In late Easters, growers have the luxury of using the extra time to increase bud count by manipulating temperature during flower initiation. In early Easters, growers are looking to cut corners and rely on insurance lighting to make up for lost cooling. For the 1999 lily crop there will be no extra time to play with bud count and no need for insurance lighting, just enough time to run on schedule.

Begin case cooling bulbs 23 weeks before Easter, and greenhouse forcing of case-cooled bulbs by week 17. With pot-cooled bulbs, plant by week 23 and allow the full three weeks in the greenhouse for root development before cooling. Once the six-week cooling period is completed, begin greenhouse forcing on week 14.

Use the "1999 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 1999 schedule, will help you make informed management decisions.

Bulb handling: Bulb mites (*Rhizoglyphus robini*) have been a problem in the past and are always present on lily bulbs. In years

when bulbs experience a lot of stress in the field mite problems tend to be more severe. Control bulb mites by soaking bulbs in Kelthane (2 oz/10 gal.) or Dursban (8 to 16 oz/100gal) for 30 minutes.

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 and bud count decreases. 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. Good root development during this period will result in higher bud counts later.

After rooting, pot-cool 'Nellie White' bulbs at 40°F to 45°F for 1000 hours (six weeks). (Note: With 'Ace' no longer available, 'Nellie White' will be the only cultivar that will be widely available on the market this year.)

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 and DO NOT OVER COOL. Check the peat used to pack bulbs. It must remain moist for bulbs to perceive the cold treatment! As with CTF, cool 'Nellie White' at 40°F to 45°F. 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 and the sprouts are long, bulbs can be planted sideways with the shoot in the center of the pot. Plant bulbs deep to stimulate stem roots. Raise bulb temperature to 60°F to 63°F. Do not allow bulb temperature to exceed 65°F as some of the cooling effect will be lost. Insurance lighting should not be required on the 1999 unless you are unable to achieve the full 1000 hours of cooling before greenhouse forcing is due to begin.

Insurance lighting is used to compensate for insufficient cooling. If you arrive at week 14 with CTF or naturally cooled bulbs, or week 17 with case-cooled bulbs, and have not accumulating the 1000 hours of cooling needed for normal greenhouse forcing then you will need to use insurance lighting. If insurance lighting is needed, provide one week of lighting for each week of cooling needed to reach 1000 hours. Do not use more than two weeks of lighting in compensation for lost cooling. Incandescent lighting used for photoperiod control (10 fc from 10 p.m. to 2 a.m. daily) will do the trick. Be aware that insurance lighting increases stem stretch so you will need to take height control measures before lilies become too tall.

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, two leaves/day at 72°F and 2.5 leaves/day at 82°F. Forcing temperatures between 55°F to 70°F produce the highest quality lilies and are most fuel efficient.

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. 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.

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

Lily storage: I do not anticipate a need for long periods of cool storage for the 1999 crop since Easter falls on a moderately early date. But once again weather will have an influence on this. If necessary, lilies can be stored for up to 10 days in the dark at 35°F to 45°F when buds turn white but before they open. Spray with Chipco 26019 (4 to 8 oz./25 gal.) or dust lightly with Daconil 2787 WP for Botrytis control during storage. Follow label directions. Water thoroughly before storage and place in a SHADY location after removal to avoid excessive wilting.



Leaf yellowing: Lilies held in cool storage suffer from reduced post-harvest life compared to non-stored lilies. Leaf yellowing and early flower senescence are both consequences of prolonged cool storage. To maximize post-harvest life, maintain proper nitrogen fertilization and proper spacing during forcing. An application of 100 ppm Accel or Promalin to all leaves on the lower portion of the stem, during weeks 7 through 5, can be used to prevent leaf yellowing in the late stages of production. For leaf yellowing caused by cool storage, apply Promalin two to four weeks before storage. Both Accel and Promalin contain a cocktail of plant growth regulators – the cytokinin benzyladenine and the gibberellic acids GA₄ and GA₇. Promalin has 10 times more GA than Accel. The GA compounds are important in reducing leaf yellowing but

they also cause stem stretch. Therefore, it is important that you