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Volume 9 Number 11 February 2020

Lower-leaf yellowing on potted lilies

Spring isn't just for Easter lilies! Asiatic, Oriental and hybrids such as LA (Easter lilies crossed with Asiatic lilies) are also popular garden perennials and are commonly forced into flower for sales similar to Easter lilies. Regardless of which type of lily is being forced in the spring, one common problem can plague them all- lower leaf yellowing (Fig. 1) When the lower leaves turn chlorotic and senesce, this ultimately reduces the marketability of these plants and labor must be used to remove the leaves or sleeves used to hide them, both of which increase production costs. In extreme cases this can render them unsalable.



Figure 1. Lower-leaf yellowing can be a problem on all types of potted lilies, including Easter, Asiatic, and Oriental lilies. The plant in the middle of the image is missing well-over one-third of the lower leaves, rendering the plant unmarketable. Note the lower leaves of lilies in the background have fully senesced and turned brown.

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Figure 2. Lilies are very well-suited for growing on tight spacing, and the resulting high planting densities make them a space-efficient crop. However, when the canopy is closing and the crop is maturing, this can cause lower leaves to turn yellow.



Figure 3. The lower leaves of these Easter lilies have been treated with a foliar spray containing a plant growth regulator containing both benzyladenine (BA) and gibberellic acid (GA). Note the lower leaves are green and no yellowing is visible.

There are several environmental and cultural factors which can contribute to lower-leaf yellowing of lilies. First, lilies can be grown with a high planting density since they can be spaced so closely together (Fig. 2); as a result of the close spacing, however, lower leaves don't receive sufficient light to maintain chlorophyll health and start to turn chlorotic. Lower-leaf yellowing can also be exacerbated by growing lilies with a negative, where night air temperatures are warmer than day air temperatures. Finally, putting lilies into a cooler to hold them for sale causes leaf yellowing to occur. Aside from the environment, a few cultural factors can induce leaf yellowing. For example, weak root systems from overwatering and/or pathogens can cause lower-leaf yellowing. Additionally, there are reports that growth retardants can also induce lower-leaf yellowing.

How can you avoid lower-leaf yellowing? Being judicious about watering and growth retardant applications can help. Also, growing with a positive DIF (day air temperature > night air temperature) can also help. Although provide plants with more space may reduce lower-leaf yellowing, this would also reduce profitability due to the lower plant density. Thankfully, there is a simpler solution to suppressing lower-leaf yellowing on Easter lilies.

Foliar sprays of plant growth regulators (PGR) containing a combination of benzyladenine (BA) + gibberellic acid (GA_{4+7}) applied to lower leaves suppresses lower-leaf yellowing on lilies (Fig. 3). This BA+ GA_{4+7} PGR is commercially available as Fascination (Valent) or Fresco (Fine Americas). This same PGR is used to promote poinsettia stem elongation early in the season if plants are below target heights or later in the season to promote bract expansion. Additionally, BA+ GA_{4+7} can be used to suppress lower-leaf yellowing of geranium cuttings during propagation.

There are a few key considerations for being successful with using BA+GA₄₊₇ to suppress lily lower-leaf yellowing. First, consider application timing. For leaf yellowing that occurs during production, the first application can be made 7 to 10 days *before* the estimated visible bud date. Another application can be made 7 to 10 days *after* visible bud date to suppress lower leaf yellowing for the remainder of the greenhouse production phase. For leaf yellowing that occurs when plants are being held in coolers, make application no more than two weeks prior to placement in coolers; applying it earlier will not give sufficient control during storage.

In addition to application timing, the application target needs to be carefully considered. For the early and mid-season applications to suppress lower-leaf yellowing during the greenhouse production phase, sprays need to be applied to the lower leaves only. If the BA+GA₄₊₇ solution is applied to the entire shoot, and not just lower leaves, unwanted stem elongation can occur. For late applications made for leaf yellowing resulting from cooler storage, the entire shoot (all foliage and flower buds) should be treated.

Finally, the concentration of BA+GA₄₊₇ used will vary depending on the genetics being treated and which type of leaf yellowing is being suppressed. For early and mid-season application to suppress lower leaf yellowing in the greenhouse, Easter and LA hybrid lilies should be treated with (BA+GA₄₊₇) 5+5 to 10+10 ppm, whereas Oriental lilies should be treated with 100+100 ppm. Alternatively, for late-season applications made to suppress leaf yellowing in coolers 100+100 ppm is applied, regardless of which type of lily is being treated.

Lower-leaf yellowing can reduce the appeal of any potted lily. However, thankfully BA+GA₄₊₇ is a tool that can successfully maintain desirable foliage coloration for lilies, from the greenhouse through the cooler.



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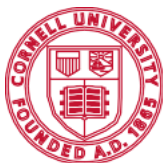
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