ble (flower initiation). Specifics of how to leaf count are detailed later in this bulletin.

Leaf counting is critical to determine the greenhouse temperatures to grow your crop at to insure that it flowers on time. Successfully timing an Easter lily crop is almost entirely dependent on the effective temperature management during the period between flower initiation until visible bud (about March 7-15th this year); there is little flexibility in timing once a crop reaches the visible bud stage.

Graphical Tracking and Growth Regulators:

An Easter lily crop should be graphically tracked if a desired plant height at flower is necessary or specified by the retailer. Graphical tracking should start when a shoot emerges from the media. A graphical track for the 2000-2001 growing season is shown in the previous article. The only critical information that you need to modify this graph is the date of emergence, desired finishing date, height at flower initiation, height ant visible bud and the final desired height.

Do not apply growth regulators unless you have to. Instead, use temperature control. Drop temperatures (about 5-10°F) during the first 4 hours of the day (at dawn). If you have to apply growth retardants, spray A-Rest (25 ppm), or Sumagic (5 ppm) periodically as needed. Remember that application of growth retardants encourages lower leaf yellowing!

Visible Bud to Market:

The period from visible bud to market requires a minimum of 24 days and a maximum of 42 days. In other words, if your plants are not at visible bud 24 days before Easter (March ?? This year) , you will never make it!

Lower leaf loss occurs during this period and is due to either 1) inadequate light 2) high soluble salts, 3) water stress or 4) root rot. **Therefore, it is imperative that plants are spaced adequately and that they are drenched with fungicides for *Pythium* and *Phytophthora* spp. and *Rhizoctonia* control at visible bud.** It is also critical that there is good air movement within the crop to discourage prolonged periods when media and foliage is moist. Alternatively, consider spraying Promalin (cytokinins) to lower leaves to inhibit lower leaf yellowing (50 ppm Promalin) 1 week before and again 1 week after visible bud.

Use the Easter lily bud meter (to the right) to determine how many days are required until flowering. Note that the meter should be placed at the base of the bud (where the petal meets the pedicel)—not where the bud meets the stem.

The Most Common Problems in Easter Lily Production

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Height Control

Height control on Easter lilies is typically a problem later in the production schedule when 1) day temperatures increase and 2) plants are more crowded. Easter lily height is controlled by either applying a chemical growth retardant (A-Rest or Sumagic) or by reducing the difference (DIF) between day and night temperatures that plants are grown at. It is preferable to control elongation by manipulating day and night temperature to reduce DIF. Application of chemical growth retardants can result in some undesirable side effects. A-Rest application can result in increased lower leaf yellowing and loss. In contrast, Sumagic application can increase non-uniformity in a crop and, in some cases, can result in over application and excessive reduction in elongation.

Solution: Track plant height over time using the enclosed graphical track. Alter the day and night temperature in your greenhouse to maintain plant height between the two lines on the track. Remember, that stem elongation is most sensitive to temperatures during the first 3-4 hours of the day. Drop temperatures at this time (no more than 10oF) to reduce elongation. Increase temperatures at this time to increase elongation. If temperature control is not possible, apply a Sumagic spray.

Root Rot

Easter lilies are very susceptible to root rot. Root rot is a root disease complex that usually includes both *Rhizoctonia* and *Pythium*. Excessive root rot results in loss of lower leaves, reduced plant height, reduced flower and leaf size. This is most evident later in the crop schedule in March and/or April. In addition, excessive root rot can result in flower bud abortion if it occurs early.

Solution: Control root rot by 1) culturally reducing the likelihood of the disease and 2) drenching with fungicides. I have come across growers who can control root rot entirely through water and media management. However, most of us will need to apply chemical fungicides.

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Apply fungicides for BOTH *Pythium* and *Rhizoctonia* control. Rotate fungicides to reduce the chance of resistance. There is significant Subdue resistance evident in greenhouses this past year. Therefore, make sure that your fungicide program includes Truban. There is no documented resistance to Truban as of yet. I suggest the following rotation on a monthly basis starting after potting: 1) Subdue (1/2 oz/100 gallons) + Cleary's 3336 (8 oz/100 gallons), 2) Banrot (10-12 oz/100 gallons), 3) Truban (8oz/100 gallons) + Terraclor (8 0z/100 gallons). If another application is needed, start at the beginning of the rotation again.

Crowding

Plant crowding can significantly decrease crop quality at the end of a production cycle from visible bud until flowering. Typically, stem elongation increases and there is more lower leaf loss. There appears to be a relationship between total light and problems related to crowding where there is more lower leaf loss under low light conditions.

Solution: Space plants if possible. Spacing allows for more light to reach the lower leaves and allows more air movement to limit the possibility of root rot. Recent research has shown that application of Promalin a week before and a week after visible bud to the lower leaves only will reduce lower leaf yellowing. Therefore, if you don't have the space to space, apply Promalin.

Scheduling:

Plants can flower too early or too late when plants are not grown at appropriate temperatures between Jan. 28 (flower initiation) and the visible bud date. Inexact scheduling usually occurs because a grower has not counted the leaves yet to unfold and then delivered the average daily temperature to achieve the desired leaf-unfolding rate.

Solution: Count leaves around January 28. Determine how many leaves need to unfold per day by the visible bud date. Monitor the leaf-unfolding rate of your crop on a weekly basis. Adjust average daily temperature to achieve the desired leaf-unfolding rate. Articles in this bulletin go through the process in more detail.

Over or Under cooling:

In general, a lily crop should receive 6 weeks of cooling at 42°F. If lilies are cooled for less time, we say they are under cooled and plants will be taller, have more flowers, be less uniform and take flower to flower. If lilies are cooled for longer than 6 weeks, we say they are overcooled and plants will have fewer leaves and flowers, have short lower leaves, and will flower quicker. If bulbs are cooled at temperatures above or below 42oF for 6 weeks they will be overcooled! If bulbs are immature when you start cooling, it is possible for bulbs to be under cooled even if you cool for 6 weeks at 42oF.

Solution: Prior to cooling, bulbs should be maintained at temperatures above 63oF. Once you put plants in a cooler, place a soil thermometer in the media in the cooler and adjust cooler temperature to achieve 42oF. Cool for exactly 6 weeks.

Early Shoot Emergence While in the Cooler:

Shoots can emerge in the cooler if dormancy is broken early and stem elongation starts before cooling is complete. This can be a significant problem in dark coolers and/or coolers in which pots are stacked in such a way that no light reaches each pot. As a result, there can be excessive shoot elongation resulting in a complete loss of product.

Solution: Drop temperatures on a weekly basis for 1-2 days to 36°F to inhibit elongation. Provide fluorescent or daylight in the cooler to inhibit elongation. Stack plants in the cooler in such a way as to insure that 1) you can see if early shoot emergence is occurring, 2) to allow light to reach the surface of the media, and 3) dump a pot periodically to see if elongation of the shoot is occurring before the shoot breaks through the media surface and drop temperatures periodically to limit shoot (pin) emergence.