SANTA CRUZ DAHLIAS

Dahlia Cutting Tuber Production and Light Exposure

SUMMARY

Dahlias grown from rooted cuttings will produce a clone of the plant or tuber the cutting was taken from. It is well-known that following a full season in the field, the tuber yield from a plant propagated from a cutting is typically lower than that of a plant of the same cultivar grown from a tuber.

In the winter of 2026, Santa Cruz Dahlias designed a field study to test the hypothesis that short-day light exposure early in the growth of a dahlia cutting may increase the production of tubers.

Dahlias are short-day bloomers and tuber makers. When they are planted (typically in late spring or early summer), the days are increasing in length. Dahlias respond to these longer days by making roots underground and putting on green branches and leaves above ground.

Once the summer solstice (June 21 in the Northern Hemisphere) passes and day length starts shortening, dahlias respond by producing blooms, making seed, and developing tubers underground.

Although we refer to seasonal light as long days or short days, plants actually measure the nights, not the days. What triggers them to start making flowers and tubers is longer nights, not shorter days. Humans, however, tend to measure the season by the length of the days, so for this reason we will refer to seasonal light as long days and short days.

It's pretty well understood that dahlia tubers do most of their development as daylight begins to shorten, but our research led us to hypothesize that a cutting also needs a brief period of short-day exposure when it is very young to set the trigger for the plant to better develop tubers.

Most propagators expose cuttings under long-day conditions to promote strong root development and plant growth. When those cuttings are received by customers, most continue to give them long-day exposure under grow lights or outdoors to continue the above-ground growth.

Our hypothesis was that giving young cuttings two weeks of 10-hour light exposure before planting might trigger them to increase tuber production over a growing season.

METHODS

Our experiment in Santa Cruz, California involved growing two distinct sets of cuttings in our field under identical conditions. The only difference between the two groups was the day-length light exposure they received in the final two weeks indoors before being planted in the field.

On February 11, 2026, we received 150 virus-free rooted cuttings from Stonehouse Dahlias. These had received long-day light exposure in Utah for five weeks before we received them. They were an assortment of 21 different KA's varieties. Upon receipt, all 150 cuttings were potted up into 4" pots filled with quality potting soil.

Light Exposure

One half of the cuttings continued to be exposed to long-day light exposure under grow lights for 14 hours per day. The other half received short-day light exposure of 10 hours per day. The lights were the same distance from the plants in both groups. Both long-day and short-day cuttings received the same amount of water and nutrients during their two weeks under lights. The brand and model number of the grow lights were identical between the two groups. Both groups were grown indoors under grow lights. They were not in a greenhouse.

Field Life

Between February 25th and 27th, both groups of cuttings were planted in the field in 60-foot rows. These cuttings were planted 5 inches deep up to the first leaf node. The field conditions (water, nutrients, spray regime for pests and powdery mildew, flower harvesting, deadheading, light and shade exposure, and four weeks of Agrabon row cover) were identical for both groups. During the growing season, the plant tags were not viewed, so there would be no preferential treatment of one group of plants over another. In both groups, the blooms were harvested twice a week for sales to florists and designers.

Tuber Harvest

Between September 23rd and 25th, 2026, after seven months of field growth, the long-day and short-day plants were cut down, and the tuber clumps were dug up. They were washed as they came out of the soil and were divided on the day they were dug up. All the dividing was done by Kristine Albrecht. For a tuber to be saved and counted, it had to have a firm body, an intact neck, and a visible eye. Tubers with broken necks or those without eyes were not kept and did not count toward the tuber totals.

Virus

It is not known whether viruses in dahlias affect tuber production. For this reason, all the cuttings in this study came directly from Stonehouse Dahlias and were virus-free. None of the cuttings in this study were home-propagated.

RESULTS

In aggregate, the plants that received short-day light before field planting yielded over twice the number of tubers as the plants that only received long-day light. The exact statistic was a 121% increase in tuber yield from two weeks of short-day light exposure. To put this result in real numbers, if a cultivar that received only long-day light before planting yielded 3 tubers, the plants of the same cultivar that received two weeks of short-day light before planting would (on average) yield 6.6 tubers. We believe this result is statistically significant given the sample size and the wide range of cultivars tested.

Although this study focused on tuber yield only, there was a noticeable difference in the quality and size of the tubers in the long-day and short-day groups. On average, the tubers produced by the short-day plants were larger and looked healthier than those produced by long-day plants. This result was not universal. Some cultivars produced tubers that were virtually identical between the two groups; however, with some cultivars, there was a noticeable difference.

Additional Questions

Could some cultivars be better tuber producers than others and skew the results? Tuber production is indeed a genetic trait that varies widely between cultivars. Some consistently make numerous tubers, while others make very little. For this reason, our study included 21 different cultivars. We were exploring whether or not a tuber production response could be triggered by light exposure across a variety of cultivars. Of the 21 cultivars we tested, 20 produced more tubers per plant when exposed to short-day light. The single exception produced the same number of tubers per plant on average when compared to the plants that received long-day light before field planting.

Could there be a greater increase in average tuber yield if the short-day light treatment was longer than two weeks? It is possible that longer short-day exposure, or exposure for less than ten hours, could increase the tuber production response in dahlias. In the 2027 growing season, we will reproduce this study and add more variables to help answer these questions.

Could short-day light "fix" a cultivar that typically has poor tuber production? No; our results showed a little more than doubling of tuber production on average among cultivars that typically produce many tubers and those that typically produce few. Those cultivars that produce few tubers saw this doubling as well, but compared to cultivars that typically produce many tubers, they were still behind in the tuber count.

Photos Below

KA's Tiny E

Short Day

KA's Tiny E

Long Day

Some cultivars had a dramatic difference in tuber production between short-day and long-day light exposure.

KA's Tiny E was one of those.

KA's Lavender Blush

Short Day

Some cultivars had almost no difference in tuber production between long-day and short-day light exposure.

KA's Lavender Blush is an example.

KA's Lavender Blush

Long Day

Some cultivars displayed consistently larger and plumper tuber production from short-day light exposure when compared to long-day light exposure.

KA's Sicilian Summer is an example.

Some cultivars showed virtually no difference in tuber size between short-day and long-day light exposure.

KA's Aloha is an example.