

# Propagation of Garden Mums



## Upon Arrival

Stick immediately upon receipt for best results.

If necessary to hold cuttings, open the boxes and inspect.

Cuttings can be held at 34 to 38°F (1 to 3°C) for no more than 2 to 3 days. Leave the cuttings in the plastic wrap to prevent dehydration. If cuttings are wilted, increase the humidity in the cooler to <85%.

## Media

Use soilless media that is well-drained with good aeration and moisture retention.

Maintain soil pH of 5.8 to 6.2 with an EC of less than 1.0 (mmhos/cm, SME).

Stick into moist media (4 on a 1-5 scale) and water-in so the soil is in contact with the stem.

Maintain media temperature between 70 to 74°F (21 to 23°C) using bottom heat.

50 to 100-count trays are most common.

## Rooting Hormone

If desired, spray 100 to 200 ppm KIBA on cuttings the morning after stick, or do a pre-stick basal dip of 1,000 to 1,500 ppm IBA.

When spraying with KIBA, it is important to apply enough volume to run down the stem. Treat in both directions to ensure uniform application on all sides of the cutting.

Recommended for slow or harder-to-root varieties.

## Misting

During the first 24 hours after sticking, it is critical to apply enough mist to rehydrate the cuttings, so the leaves are no longer limp.

After the first 24 hours, use the minimum mist that will prevent wilting. Start reducing mist once callus starts to form.

Apply only enough mist to wet the foliage and slightly increase soil moisture. Saturated soil will slow rooting due to excess callus formation.

Misting schedules should be adjusted to respond to current conditions, including light, temperature, humidity and degree of rooting. Reduce mist as soon as possible, beginning with a reduction during the night and pre-dawn period. By Day 4, night mist should not be needed to maintain turgid cuttings. Discontinue mist after 10 to 14 days, when roots reach the edge to bottom of container.

- If using a mist timer, adjust the frequency and duration to apply the minimum amount without wilting: Days 1 to 4, use 5 seconds of mist every 10 to 15 minutes.
- Days 5 to 8, use 5 seconds of mist every 15 to 20 minutes.
- Days 9 to 14, use 5 seconds of mist every 25 to 30 minutes.
- If using a VPD system, use a low value for the first day to rehydrate the cutting. Then increase gradually for the next 6 days, with a rapidly increasing value for the next 7 days. The pivot to the rapid increase is when the root initials begin to form ("root-horns").

## Air Temperature

70 to 80°F (21 to 27°C) is important to prevent flower initiation during rooting, and it enhances rooting.

## Light Levels

Reduce the light intensity to 1,500 to 2,500 foot-candles during the first 2 days, to help rehydrate the cuttings during hot, high-light periods.

Maintain 3,500 to 4,000 foot-candles once roots begin to form. High-light intensity will produce high-quality liners.

## Photoperiod Control

Night-interruption lighting is recommended year-round at 10 foot-candles (100 lux), 10:00 p.m. to 2:00 a.m., to keep the cuttings vegetative and reduce premature budding.

## Fertilizer

During rooting, feed 2 to 3 times a week, 1 to 3 days after stick (at 200 to 250 ppm N) or use a constant liquid feed of 100 ppm N.

Monitor the pH and EC to maintain in the appropriate range for good growth.

## Plant Growth Regulators

B-Nine can be applied at 1,000 to 2,500 ppm. Apply first application on Day 7 after stick to reduce stretch; an additional application may be made on Day 14.

Florel can be applied at 350 to 500 ppm during propagation at Day 10 and 17. Results vary and may help prevent premature budding.

Bonzi is not recommended during propagation.

## After the Cutting Is Rooted

Rooting liners can be transitioned to the finished growing-on environment.

Maintain warm night temperatures (>68°F/20°C) and long days up until April 15, when days are naturally long. Avoid low temperatures (<55°F/13°C), as this can trigger premature flowering.

Any stress at this time will reduce quality and may cause premature budding. Do not let liners wilt or soil remain saturated, as this can increase disease infection. Do not allow the liners to become rootbound and transplant as soon as appropriate. If left in the trays too long, the liners can become hard and may not take off uniformly when planted.

Fertilize the liners prior to planting with 300 to 400 ppm from 20-10-20 to ensure strong growth after transplant.

Water-in immediately after transplanting with fertilizer at 300 to 400 ppm N.

## Disease Management

Refer to online pesticide recommendations for appropriate chemicals for use in your location.

Chrysanthemum white rust (CWR) is a major disease that you should treat proactively to prevent infection. Refer to the CWR Grower Facts on [BallSeed.com](https://www.ballseed.com) for detailed information.

Botrytis is a serious problem when excess humidity is present. Application of Pageant fungicide within 3 days of sticking provides excellent disease control and promotes more uniform rooting.

Application of a pre-transplant soil drench to the liners to manage Pythium and other soil-borne diseases will enhance rapid establishment in the final container.

## Insect Management

Refer to online pesticide recommendations for appropriate chemicals for use in your location.

Mites have become a significant pest in the last several years. Monitor the plants in the propagation area, as this may be a source for mites to move onto the mum liners.

Leafminers are a common pest of mums. Begin your monitoring and spray program for adults and larvae as soon as misting stops.

Fungus gnats and Shore fly larvae can cause significant root damage if populations are allowed to become established. Start with clean floors and apply bio-controls after sticking to keep populations under control.

Aphids can become a spontaneous problem in the Summer months, when large populations suddenly appear on the crop. Regular monitoring is critical to stop infestations from spreading.

Whitefly and thrips can become problems late in the crop, but seldom are serious pests during propagation.