

Cultural recommendation

Chrysanthemum, Garden type

Description

Name: Chrysanthemum

Family: Chrysanthemum x morifolium



Product use

Use: Garden, pot plant, landscaping

Exposure: Full sun

Technical recommendations

The chrysanthemum are short day plants (SD) which means that the plant starts its bud/flower development as soon as the nights become longer (> 13,5h) than the day. There are two periods in the growing process:

- *Long day/vegetative stage.* This period determines the final size and diameter of the plant
- *Short day/ generative stage.* A dark period of at least 13,5h out of 24h is necessary for flower initiation.

Starting from URC

If you receive unrooted cuttings (URC) you can stick them directly in the final pot or in a rooting tray.

General requirements for the rooting process:

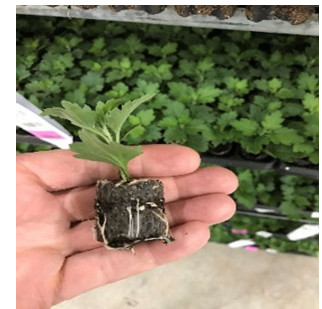
- Rooting media temperature: 20-22 °C
- Long day conditions
- From day 0 to 7th Relative humidity 90-95% and from day 8 to 13th from 90% to gradually 65%
- Shade. First week keep maximum 20-25Klux when temperature rise above 24°C. Second week the cuttings should be shaded if they are starting to wilt and temperature rise above 24-26°C.

Starting from RC

If you receive rooted cuttings (RC):

- Make sure pot media well watered with evenly moist throughout the entire pot
- Plant RC immediately upon arrival
- Plant rooted cuttings RC deep enough to cover the bottom 2-3 leaves with soil. The shoots emerging from the covered nodes will provide additional support to the plant.
- During the first days after planting, do not let the plants to dry out. If necessary, spray them with fresh water to prevent wilting.

Planting dates depends on: flowering time, pot and plant desired final size, climate and growing condition and location. Please check the specific recommendation for each variety and series.



Technical recommendations

Pot size and spacing

As a general reference the final plant size should be = pot size x 2,25

Pot size cm ø	9 -10,5	12	15 (1,5 l)	16-17 (2l)	19 -20 (3l)	22-25 (4l)
Plant size cm	15- 20	20-25	25 - 30	40 - 45	50-55	60-65

The spacing will depend on pot size and the final plant size market requirements. As a reference of final spacing, you can calculate the expected diameter of the plant plus minimum 5 cm.

Suggested spacing:

Pot size cm ø	Spacing cm (on center)
9-10,5	20-24
12	27-35
15	40-50
19-20	45-60
22-25	55-65
30	65-75

Place the plants pot to pot the first 3 or 5 weeks after planting. Then the plants can be placed outdoor in their final crop density. Make sure they have sufficient space in which to develop.



Pinching

Most of the varieties have self branching capacity hence pinch is not required. If you have to pinch because young plants stretched too much, do a “soft pinch” 12-15 days after potting, removing maximum 1,5 cm of the tip. A hard pinch or pinching after week 29 may delay flowering.

Substrate

Use a well-drained, disease-free, soilless medium with a good structure and pH 5.8-6.2.

Fertilizer

Start feeding when first roots become visible. As a general rule, during the vegetative period, use a complete balanced fertilizer 2-1-2 NPK + microelements at 0,8-1,2 gr/l in every watering. During the generative period (flower development), switch to complete balanced fertilizer rich in potassium 1,5-0,5-2 NPK+ microelements at 0,6-0,8 gr/l in every watering until flower buds are well developed and show the first color. Then use only clear water until the end of the crop.

To enhance leaf color and extend shelf life, periodical foliar treatment with magnesium sulfate can be applied at 1 gr/L during vegetative period and before the plant is showing the first flower color.

Slow-release fertilizer may be beneficial in supplementing fertilizer under outdoor production conditions.

Monitor pH, EC and NO₃ of the media periodically and adjust fertilizer program accordingly.

Technical recommendations

Temperature

After planting, keep night temperatures > 16°C to promote growth and reduce the potential for budding. Night temperatures < 12°C can cause bud initiation even under long day conditions. Place the crop outdoor when night temperatures are > 15°C .

Watering

Whenever possible, a drip systems should be used. Overhead irrigation can promote leaf diseases. Foliage should be kept dry overnight. Never allow the plants to wilt during the early stages. Provide regular watering preferably early in the morning. Under warm summer conditions, to keep the soil evenly wet, it is good to give the daily water requirement in 2 or 3 gifts with some time in between. Media should be allowed to moderately dry between irrigations to prevent diseases and promote stronger growth. Avoid strong fluctuations between too wet or too dry in order to prevent prevent yellow leaves, root damages and diseases.

Light levels

Full sun. Low light levels promote stem stretch, soft plants and reduced plant quality.

Photoperiod control

Long days are needed to generate vegetative growth and sufficient long days must be provided to obtain the proper finished plant size. Long days should always be provided during propagation. Short days are needed for flowering. Artificial short days can be provided to program a continued production the entire garden chrysanthemum sales season.

Tips to produce a Chrysanthemum under artificial short day program:

- Begin the artificial short day when crop height is approximately 60% of desired finish size
- Cover the plants with a light barrier like blackcloth, thin black plastic, etc. for at least 12 hours a day. There different options depending on the temperature and weather conditions.
 - 1/ pulling the blackcloth before the sun sets and opening after sunrise (19:00 h – 7:00 h)
 - 2/ pulling blackcloth early in the morning rises and opening late morning (5:00 h – 10:00h) when the afternoon temperatures are high. Under hot summer conditions, another option is to open the blackcloth to release heat after it is dark and close it again before sunrise.
- Light intensity under the blackout must be < 2 Lux.
- Plants should be covered every night for at least 4-5weeks to initiate the flowering process.
- Blackcloth can be laid directly on top of the plants or a support structure.
- Early summer varieties are less or not suitable for obscuration. Please contact our sales/tech department for more info.
- Obscuration is effective up to week 36.

Growth Control

Growth can be regulated by proper planting dates, pot size, space and water/ fertilizer management. As a growth regulator (PGR), Daminozide 85% (Dazide/Alar/B-nine) is the most commonly use if need it. Don't start the applications too late. Plant in full growth cannot be stopped at once. Application frequency and dose depends on variety, weather conditions, stage and growth rate. Most of our varieties do not need PGR's under outdoor productions conditions

As a guideline:

- With moderate growth : use 0 - 1 times Daminozide 85% at 2-4 gr/ l spray
- With strong growth : use 2-3 times Daminozide 85% at 2-4 gr/ l spray

Do not apply Daminozide after the buds can be seen to avoid flower delay. Best is to use Daminozide when it's cloudy or in the evening.

Technical recommendations

As good indicator of the growing status, is to check periodically the diameter of the plant and take records and photos. As a reference; six weeks before forecasted flowering, when chrysanthemum starts the induction, the diameter of the plant should be approximately 60% of the desired final size. If case you exceed the target you should apply PGR's or if you don't reach the target increase watering and fertilization.

These recommendations for plant growth regulators should be used only as general guidelines. Growers must trial all PGR under their conditions and follow the registration uses of each chemical in their country.

Premature bud set

To prevent chrysanthemums for premature bud set, it is necessary to keep them actively growing. Therefore, it is essential to provide the plant with optimum moisture and fertility levels. Under low temperatures, relying on only natural daylength can lead to premature bud set.

- Maintain night temperatures > 18°C during early stages
- Ensure plants are under long day conditions . Critical daylength required to maintain vegetative growth is > 15 h.

Heat delay

Flowering delay may occur due to prolonged day temperatures >32°C and in night temperatures above >25°C. There are differences in sensitivity depending on the varieties.

Pest and diseases:

Chrysanthemum is sensitive to various pest. Aphids, thrips, leaf miners, caterpillars, spider mites and white fly are the most common pest. Start with clean material a well disinfected facilities together with a proper pest management program using different control strategies: exclusion, monitoring, biological and chemical control, are the best tools to control these pests.

Chrysanthemum is also sensitive to several diseases like, Rhizoctonia, Pythium, Botrytis, White rust, Sclerotinia, Septoria, Verticillium, Fusarium and some viruses like TSWV and Stunt virus. Disease management should be addressed by sanitation strategies, environmental conditions control, biological and chemical control.

For the chemical control, follow the registration uses of each product in each country.

Cultural recommendation

Crop Schedule under natural day length (sales autumn)

		Suggested planting week											
Diameter (cm)	Suggested pot size cm	18	19	20	21	22	23	24	25	26	27	28	29
30 - 40	14 - 15								Green	Blue	Yellow		
35 - 45	17 - 18							Green	Blue	Yellow			
40 - 50	19 - 20						Green	Blue	Yellow				
45 - 55	22					Green	Blue	Yellow					
50 - 60	23				Green	Blue	Yellow						
55 - 65	25												

■ Early varieties
 ■ Mid varieties
 ■ Late varieties

* This is a reference time schedule that can vary depending on the variety, growing conditions and region. Schedule start from RC. For further information on each variety, ask your Selecta One agent or technical department

Crop Schedule under artificial short day *

Pot size	Expected final diameter	Vegetative growth (long day period) weeks	Generative growth: Obscuration (short day period) weeks	Growing time, weeks
12 cm	20-25 cm	3-4	6	9-10
15 cm (1,5l)	25-30 cm	5	6	11
17 cm (2l)	35-40 cm	7	6	13
19 cm (3l)	45-55 cm	9	6	15
21 cm (4l)	55-65 cm	11	6	17

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NOTE: Growers should use the information presented here as guidelines only. Selecta One recommends that growers conduct a trial of products under their own conditions. Crop times will vary depending on the climate, location, time of year, and greenhouse environmental conditions. It is the responsibility of the grower to read and follow all the current label directions relating to the products. Nothing herein shall be deemed a warranty or guaranty by Selecta One of any products listed herein