



Start out weed-free: your first step to profits

Weed control

For dahlia production, weeds can be controlled by the use of herbicides. Once the soil surface is covered by the dahlia foliage, weed control will no longer be necessary. Start with a weed-free planting bed. After planting the tubers but before the emergence of shoots, the germination or early development of weed seeds can be prevented by spraying a soil-applied herbicide according to instructions: several days after planting, spray moist soil with this herbicide according to instructions. The recommended dosage is given on the label. Control newly germinated weeds after the emergence of the dahlias with a low dosage of a contact herbicide, being sure to follow instructions. Recommended contact herbicides will also retard the growth of the dahlias to some degree. Repeat the spraying after about 10 days if more newly germinated weeds appear. Spray during the evening but not if hot sunny weather is predicted for the next day. Increase the dosage if the weeds have more than two leaves. Doing so, however, increases the risk of crop damage. Hoeing and weeding by hand is a safe but labour-intensive alternative.

Specific care requirements

Tall dahlias need support. The weight of the plant and its flowers is so great that high winds can damage the crop by blowing the plants over and breaking off stems and leaves. For bed production, use chrysanthemum mesh or guy-wires placed around the edges of the bed. To produce long attractive stems and large flowers, practice disbudding (remove axillary shoots). A dahlia plant continues to produce new offshoots. Harvesting the flowers stimulates this and makes it possible to continue harvesting over a long period.



Lots to do for proper flowering

Harvesting flowers

For uniform flower maturity, it is important to cut the flowers every day. Waiting for up to a few days is possible, however, when weather conditions are not conducive to growth. The Dutch Flower Auctions Association employs five stages of maturity for dahlias. The recommended stages are 2 and 3 in which the outer wreath of petals has separated from the rest of the flower. Certain cultivars will not open properly after having been purchased by the consumer if they have been harvested when immature. Harvesting when overly mature, however, increases the risk of flower damage during the time spent in the distribution chain. On warm days, harvest the flowers early in the morning or late in the afternoon. Flower stems should be trimmed to the desired length. Bunching can be done immediately in the field or later in the on-site processing facility. Remove the lowest leaves. The presence of a lot of foliage above the flower is undesirable; remove this if necessary. Flower and leaves must be free of imperfections. Bunch the dahlias 10 stems to the bunch and make sure that the bunches are similar in volume and weight. Trim the flower stems in

each bunch to the desired length. After bunching, place the dahlias immediately in a water-filled container. Use a chlorine tablet to prevent bacterial growth.

Storing flowers

Shortly after harvesting, place the flowers in a cold-storage room at 2°C. Considering their limited keeping quality, a short storage period is recommended. Inform consumers that nutrients for cut flowers should be added. Nutrients for cut flowers stimulate the flowers to open, extend vase life and keep the water in the vase clean. Positive results have been achieved by using Chrysal Clear Bulb Flower Food.

Winter activities

The first ground frost in the autumn means the end of flower harvesting. It is then time to remove support material and foliage from the soil surface to get rid of pathogens. Lift the tubers and dispose of them. If the soil does not allow lifting, a prolonged frost will be enough to freeze the tubers. Always start a new production period by planting new tubers in fresh soil or after steaming the existing soil.



Using hygienic procedures prevents problems

Various pests and diseases can affect the production of dahlias for cut flowers. Here are the most common ones accompanied by their control measures. Remember to consider hygiene and to start with healthy starting material.

CAUSE		SYMPTOMS	PREVENTION/CONTROL
Dahlia smut (<i>Entyloma dahliae</i>)		Light green to yellow round spots and sometimes angular spots bounded by veins appear primarily on the lowest leaves and measure from 2 to 10 mm across. The infection occurs mainly during flowering and then particularly under humid conditions.	Use a generous crop rotation period. Choose a planting density that will allow the foliage to dry quickly after rainfall. Remove and destroy diseased and dead plant parts. If necessary, spray with a fungicide according to instructions.
Aerial stalk rot (<i>Sclerotinia sclerotiorum</i>)		The sudden weakening of one or more stalks on a plant is a symptom of this disease. Large sclerotia with the appearance of rat faeces form inside the hollow stems. Damage occurs primarily on plots that are regularly used for producing host plants such as Dahlia, beans, Chrysanthemum, Liatris and potatoes.	In case of an infestation, spray with a fungicide according to instructions. Remove and destroy diseased plants along with neighbouring plants. Steam infected soil. Use a generous crop rotation period.
Aphids		The upper leaves of young shoots become misshapen or tightly curled. Clusters of black or green aphids can be found on the undersides of these leaves and sometimes on young stems and flower stems as well.	If necessary, spray with an insecticide according to instructions.
Spider mite		Affected leaves turn dark brown in places and fall off prematurely. These symptoms are generally caused by <i>Tetranychus urticae</i> (Red Spider Mite) that occurs on many host plants. Hot dry weather increases the reproduction rate of spider mites.	Spray regularly and according to the instructions with an agent that controls red spider mite.
Thrips (<i>Thrips tabaci</i>)		Affected plants display a noticeably slowed rate of growth. Often, the lowest leaves are shaped normally but the younger leaves are highly misshapen. Flower formation is also disrupted. Hot dry weather increases the reproduction rate of thrips.	Spray with insecticide according to instructions. Be sure to treat the tips of the buds thoroughly.



CUT FLOWER PRODUCTION OF DAHLIAS

- PRACTICAL TIPS FOR
- ▶ SELECTING THE RIGHT CULTIVAR
 - ▶ SUCCESSFULLY CREATING AND IMPLEMENTING A PRODUCTION SCHEDULE
 - ▶ PRODUCING HIGH-QUALITY CUT FLOWERS





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Selecting the right cultivar and bloom time

Choice of cultivar

Choosing suitable cultivars is the basis for success. Their bright colours are what make dahlias favoured as cut flowers, but their fairly short vase life was – for a long time – a negative factor, limiting an optimum growth in sales. Breeding efforts, however, have recently led to the availability of several cultivars with a good keeping quality. Important characteristics to consider when selecting dahlias to produce as cut flowers are how most flowers they produce, flower shape, flower colour, length and sturdiness of stems, and a minimum amount of lateral branching. Many cultivars should not be harvested when too immature because their flowers will fail to open in the vase. Some cultivars, however, such as the ones in the Karma series, can be harvested while still immature. This series of dahlias has a vase life of 7 to 12 days. When choosing a cultivar for greenhouse production, pay extra attention to habit: choose cultivars with sturdy stems and moderate foliage development. The IBC Picture Book of Summer-Flowering Bulbs contains all the commonly available varieties along with their specific characteristics.

Planting material

Choose dahlias that are propagated vegetatively. The advantage of these cultivars is that all the plants will be genetically identical: same flower, same plant, same colour. Tuber sizes I and II are suitable for cut flower production. A size I tuber weighs 100 grams or more, and has larger dimensions than a size II tuber that weighs 50 to 100 grams. A size I tuber will produce more shoots because it has more growth eyes.

Storage

Coordinate the planting time with the supplier so that the tubers will be delivered just before planting. Temporary storage after delivery from the Netherlands is possible, but proper storage facilities will be required. In this case, store at a temperature of 7 to 9°C until planting. The relative humidity should be neither too low (due to the risk of fungal diseases) nor too high (due to the risk of desiccated tubers). As to location, the tubers can be stored in crates or containers under a tarpaulin in a draught-free shed without air circulation.



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Dahlias: available in many types and sizes

Dahlias that are suitable for cut flower production have been developed through cross-fertilization, and are classified into groups according to the shape and composition of the flower:

1 Decorative dahlias

The inflorescences of Decorative dahlias are completely filled with petals. Their broad ray flowers are slightly rolled inward or outward along the length of the petal. The tips of the ray flowers are usually flat or somewhat undulating but are sometimes pointed. Their height ranges from 40 to 130 cm.

2 Ball dahlias

The inflorescences of dahlias in the Ball Group are completely filled with petals and are either spherical or somewhat flattened on top. The tips of the ray flowers are blunt or rounded and are arranged in a spiral pattern, the petals being rolled inward along more than half the length of the petal. Their height ranges from 80 to 100 cm.

3 Pompon dahlias

Pompon dahlias have inflorescences similar to those of Ball dahlias but are even more completely spherical and smaller in size. Their ray flowers are rolled inward over the entire length of the petals. Their height ranges from 80 to 100 cm.

4 Cactus dahlias

The inflorescences of Cactus dahlias are completely filled with petals. The ray flowers are usually pointed, often narrow, and rolled outward over up to more than half of the length of the petals. The ray flowers are straight or arching towards the centre of the inflorescence. Their height ranges from 40 to 120 cm.

5 Semi-cactus dahlias

The inflorescences of Semi-cactus dahlias are completely filled with petals. The ray flowers are usually pointed and rolled outward along up to half of the length of the petals. The ray flowers are broad at the base and either straight or somewhat arching towards the centre of the inflorescence. Their height ranges from 40 to 120 cm.



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Fresh soil and proper nutrition for best growth

Soil

When producing dahlias as cut flowers, use fresh soil every year to reduce the risk of diseases. If using fresh soil every year is not an option, annual steaming is a good alternative. Dahlias will grow in any type of soil. The ideal pH value is 6 to 7. Applying lime will increase the pH value. Good drainage is necessary to keep underground parts of the plant from rotting; this means that water should drain quickly following heavy rainfall. Dahlias have large leaf surfaces and transpire large quantities of water. This water can be absorbed by the roots only when soil moisture levels are favourable. For these reasons, frequent monitoring of the soil moisture level is important. To do this, take some soil from around the roots and squeeze it into a ball in the palm of your hand. If the ball falls apart when you open your hand, the soil is too dry. Provide water frequently but in small quantities; one way to do this is by using drip irrigation hoses in the planting bed. Insufficient moisture results in slow growth, fewer flowers and leaf yellowing.

Nutrients

The soil must contain adequate levels of potassium and phosphate. To ensure this, efforts should be devoted to providing the soil with a normal level of nutrients. Analyse soil to determine to determine the levels of potassium and

phosphate in the soil. If the level of phosphate is too low, this nutrient will have to be applied to the soil before planting. Potassium can also be applied before planting. Work the potassium and phosphate thoroughly into the upper 15 cm. of soil. The application of nitrate can influence the vegetative development during the growth period. Monitor the colour of the leaves (they should remain a bright green) and strive for a continuous development of leaves and flowers. A nitrate deficiency will result in short plants with a pale leaf colour, but too much nitrate will produce straggling, limp plants. Seek the proper balance. Apply small quantities of nitrate frequently. Analysing the nitrate level of the soil during the growing season provides information about the existing nitrate level so that proper top dressing can be applied.

Bloom period

Under Dutch conditions, the bloom period in the field occurs between June and September. In the greenhouse, flower harvesting begins earlier. The first ground frost of the year heralds the end of the harvesting season in the field. Although autumn ground frosts will not interrupt harvesting in the greenhouse, the quality of plants during this time of year can suffer from insufficient light and fungal infestation resulting from a high RH.



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Proper preparation: the basis for success

Planting period

Dahlias grow best at temperatures between 15 and 25°C. Their Mexican origins, however, mean that they will not tolerate any frost. A ground frost that follows planting is not a problem. It is only after the shoots emerge from the soil surface that frost damage occurs. Because the shoots emerge from the soil surface two weeks after planting, coordinate the planting time for outdoor production to the period when the chance of frost is past. Under Dutch conditions, planting for outdoor production can be done in May or June, while planting the tubers in a greenhouse can be done earlier: February or March.

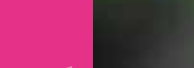
Planting density

Depending on cultivar and tuber size, planting density ranges from 6 to 8 tubers per m². Plant fewer tubers per m² if using cultivars with a large, more spreading habit. A higher density is preferable for cultivars with a slender habit. Since size II tubers will have fewer growth eyes than size I tubers, size II tubers can be planted more closely together. Planting too closely together can have an adverse effect on quality.

PLANTING DENSITY/ M ²	TUBER SIZE I	TUBER SIZE II
Large, more spreading habit	6	6 to 8
Slender habit	6 to 8	8

Planting

In the Netherlands, tubers are planted in beds 150 cm. wide of which 45 cm. is taken up by the width of the pathway. Planting 3 rows per bed with 35 cm. between the rows is preferred. Plant 3 to 4 tubers per running metre with a planting density of 6 to 8 tubers per m² respectively. Adjust the planting depth to the size of the tuber. Cover the crown of the tuber on which the growth eyes are located with 2 to 3 cm. of soil.



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A publication of



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