



Growing Gerbera In Pots With Coconut Coir

Coconut coir, or cocopeat, is one of the mostly commonly used organic substrates in gerbera cultivation. This article looks at some of the factors to consider when using coconut substrate for the cultivation of container gerbera crops.

Preparing the substrate

Cocopeat is commercially available in differently sized dry pieces, either loose or wrapped in plastic film. The substrate can vary in characteristics such as fibrousness, porosity and water retention capacity, and it is advisable that it be analysed for its physical and chemical properties before it is used in crop production. The grower should also obtain any relevant technical information for the product that has been purchased.

The substrate must be fully watered following a specific fertilisation plan. Large container tanks or a big plastic cloth can be used for this purpose. The sides of the tank should be raised and the base inclined to create a slight slope to facilitate runoff of excess water. The moistening process can be carried out one day before potting. Normally from a 600 gram piece of substrate, about 8 to 9 litres of damp substrate will be produced, ready for potting.

Set-up for container production

Structures that have been used successfully in Mediterranean environments for soilless pot cultivation consist of welded iron 6 mm rods to hold the pots and a welded iron support. A spacing of 6 to 8 plants per square meter is used, with a 50 to 60 cm wide space for the access footpath.

The drainage system can be constructed from the same plastic sheeting generally used to cover greenhouses. It should be placed on levelled but slightly sloping ground to encourage drainage. However, a better and more efficient method is to use a length of rigid black plastic in the shape of a V which is inserted under the rows of plants, and then fixed to the iron support. Although such drainage techniques are economical, at times the drainage solution may not flow particularly well. As a result, residues of drainage solution can build up in the system, leading to algal growth which can be especially harmful during cold, damp periods. However, given the physical characteristics of the pots, this method is cheap, efficient and closed to the external environment.

Potting

Before potting, the product should be gently rubbed with the hands to check that there are no clods or portions not completely wet. Pots of a dark colour (preferably black) are recommended, with a volume of 3.5 to 4 litres and a diameter of 18 to 20cm.

The pots must be filled when the coconut substrate has lost all its excess water. To improve drainage and to avoid possible blockages of the holes, it is useful to place on the bottom of the pot a layer of about 3 to 4cm of expanded clay, washed clean of dust and impurities. Other materials with similar characteristics can be used in place of expanded clay. However, these must be checked carefully to ensure that they do not degrade over time under the continuous effect of lightly acid solutions that can create a mash or 'mud' on the bottom of the pot, which can be harmful to the root ends.

The coir must fill the pot over and above the rim, forming an oval, convex top. This is to prevent the plant being pulled under the surface layer of the substrate by the root, which can lead to fungal damage to the crown of the plant.

During potting, the substrate should be lightly pressed with the hands, using the same pressure on all the pots so that the water holding capacity is similar between the pots. The plantlets should be potted at about 2 cm above the surface level of the substrate.

Nutritional issues

Generally speaking, nutritional planning when using coconut substrate is rather complicated. This is due to the highly organic nature of the substrate, which makes the cation exchange capacity (CEC) very high, and also because of the gradual degradation of the coconut due to the microorganisms present. These microorganisms make available to the plant minute quantities of nutritional elements that are so small as to be incalculable as part of the fertilisation plan.

Usually, one of the first steps is to saturate the substrate. Following this, adjustments to the nutrient levels can be made based on chemical analyses of the substrate solution. Coconut can sometimes naturally contain high levels of sodium, chlorine, magnesium and potassium.

Plant maintenance

After two months it is possible to completely remove the substrate from the pot in order to visually check the health of the roots. From this period onwards it is also possible to squeeze the substrate and test the electrical conductivity (EC) of the substrate solution.



The quantity of water held in the coconut substrate should be regularly checked for different varieties of gerbera (big, medium sized and small plants). These checks should be made daily, especially during the winter period when conditions of root asphyxia can easily occur due to the lower rate of absorption of the substrate solution. If the volume of water is appropriate, the root ends should be white and healthy. If for any reason the substrate is excessively dry or has a very high EC, a number of small daily irrigations (10 or more) should be carried out, preferably with rainwater. Alternatively, some input solution with a low EC can be used; however, usually it will take a number of days to return the substrate solution to normal values of EC, depending on the season and on the microclimate in the greenhouse. In the case of pot cultivation, the control of fertilisation and of the overall working of the irrigation system must be performed with greater frequency and attention, compared for example with cultivation in bags where there are five to six plants in the same bag. In particular, contaminated irrigation water should never be used, which can contain organic substances or toxic elements. Due to the high CEC of coconut products, the toxic effect of these substances will remain for a long time, even after frequent irrigation of the substrate.



Advantages and disadvantages

For the soilless cultivation of gerbera, the grower's options include pot cultivation using substrates of organic origin or organic-mineral mixtures, and cultivation on inert substrates (such as rockwool or perlite). In conclusion, it is worthwhile to review the advantages and disadvantages of systems such as those that use coconut coir substrates, as discussed in this article.

The advantages of these pot systems, compared with systems that use inert substrates, include:

- ◆ Faster growth of the young plantlets at the start of the cultivation process.
- ◆ Requires a low level of greenhouse technology and uses inexpensive supporting structures for the plants.
- ◆ Uses economical drainage substrates.
- ◆ Low incidence and spread of fungal diseases around the crown and the root of the plant, because of the smaller quantity of input solution used and because plants growing in pots have no contact with other plants.
- ◆ Greater tolerance of irrigation water of average quality.
- ◆ When water treated by reverse osmosis is used, a smaller quantity of water will be needed and money will therefore be saved.
- ◆ Very few environmental problems are involved in the disposal of the substrates. However, there are also some disadvantages, which also need to be considered:
- ◆ More luxuriant plants are produced, with bigger and more numerous leaves, which may be advantageous at the start of cultivation but which can subsequently create an imbalance between the number of flowers and the amount of foliage, unless pruning of the green foliage or defoliation is carried out.
- ◆ The chemical control of leaf diseases (especially botrytis blight during the autumn-winter period) becomes more difficult with a greater number of leaves.
- ◆ High labour levels will be required when the plantlets are being transplanted; for example, with the use of coconut substrate, the moistening phase takes hundreds of hours to complete, on average 4 to 6 people per day for every 1000 square metres of greenhouse.
- ◆ A greater number of 'weak' plants will develop, especially in hot climates, due to the greater heating of the substrate when organic substrates are used.
- ◆ A longer time is needed to correct the pH and EC in the substrate solution.

Acknowledgement
 This article is based on information that was extracted, with permission, from the publication *Gerbera cultivation in greenhouse* by Gerardo Mercurio, 2004, Schreurs B.V. Publishers, The Netherlands.

Industry Reports supported by :-

