PhytoCulture Control Co.,Ltd.

Ceramic Cultivation

2004

Principle

Ceramic cultivation is the cultivation method which makes roots of plants contacted to the special ceramics burned at high temperature, and supplies cultivation solution to the roots directly.

The special ceramics has many micro pores. The diameter of pores are 3 micrometers or less. And the pores have capillary attraction. By immesing the lower end of ceramics in a solution, the solution permeates into the pores of the ceramics, and the solution is held in ceramics.

The plant absorbs the solution held in the ceramics. The solution does not ooze out on the surface of the ceramics. The plant absorbs only the necesarry quantity of solution held in the ceramics. And the same quantity of the solution consumed by the plant is supplied to the ceramics because of its capillary attraction.

Therefore, the plant cultivated by using above mentioned watering system does not die of supplying too much water or forgetting to supply it. In this point, the ceramic cultivation method has an advantage over the ground cultivation method.

In addition, the ceramic cultivation method is difference from hydroponics cultivation method. By the hydroponics cultivation method, the root is directry immersing in the solution, so you need to circulate the solution or send air into the solution. On the other hand, by the ceramic cultivation method, you need not so. It can be said that the ceramic cultivation method is the energy-saving method without any moving power.

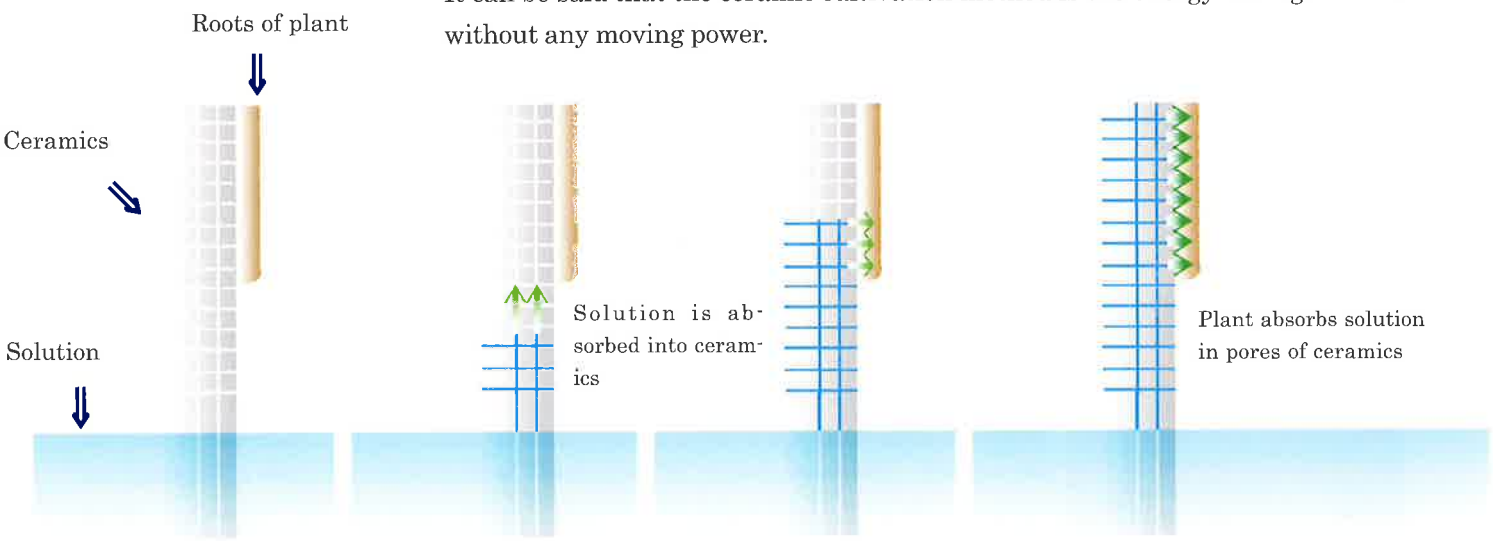

Figure of supplying solution of cultivation by ceramics

Feature

The ceramics burned at high temperature is not influenced by temperature, pH, high pressure and low pressure, etc... In case ceramics is used as an experiment tool, you can carry out sterilization work (autoclave and dry heat sterilization etc...). besides,it becomes possible to use various solutions. And as the ceramic holes are under 3 micrometers across, mold germs cannot infect from solution.

Since the ceramics is made from the uniform materials, unlike the ground cultivation method, it is possible to make the condition of the cultivation or the culture uniform in your experiment, and to do more an accurate experiment.

Cultivation

In case of mass-produce plants, hydroponics can control cultivation solution more easily than ground cultivation. It is because in ground cultivation, much of fertilizer is carried away or is adsorbed in soils. However, in the case of hydroponics, it is always necessary to circulate solution or to send air (oxygen) into the solution, so the cultivation cost becomes large. On the other hand, ceramic cultivation is energy saving method. Because, first, the lack of oxygen does not occur since the root is not immersed in solution. And second, it is not necessary to circulate solution or to sending air (oxygen) into the solution. We will proceed research and development so that lower-cost and more efficient cultivation than ever can be performed in cultivation of vegetables, fruit trees, etc...

Development

Planting in desert

A desert is expanding on a scale of the earth, and expanding desert is accelerating global warming. We primarly difined the technology of ceramic cultivation as one of the planting technology for preventing this desert expansion. The existing method of drip irrigation is prefered on a large scale in the desert. But in the case of this irrigation method, salt(which was in the ground) is often pulled out on the surface of the earth. In this condition, trees cannot be alive. If we supply excess water to plants, we make this condition. On the other hand, we can give only necesarry quantity of water to plants. So we can plant in desert without the salt damage. We think that we do our best to be used our technology for planting trees in the desert.

Rooftop planting and wall planting

Rooftop planting and wall planting is effective to relief of the heat island phenomenon.

Rooftop planting is improved by developed lightweight soil. However, problems remain. Equipment for protection from roots (which break into the roof) is needed. And the work of digging plants for roof maintenances (maintenance of a waterproofing sheet etc.)is needed because trees are planted in soil which is on the roof and the soil must be removed for maitenance. Of course, if irrigation is neglected, the plants will wither. In the ceramic cultivation method, planting on the roof can be performed easily. The plants cultivated with ceramics are only placed on the roof. When roof maintenance is required, plants can be removed easily and re-installation is also very easy. Since supplying water is also automatic, there is also no necessity for irrigation.

In the conventional method of wall planting, creepers are planted in the ground for crawl on the wall, or moorage equipment is attached on the wall and installing planters. In the method of creeper crawled, a long period is needed for plants spreading to all of the surface of the wall. In the case of the method of hanging planters, at the irrigation time, dipping water is poured on a passerby etc... If ceramic cultivation is used there is also no fear of water falling by irrigation, . And the surface of a wall can be covered with plants in a short period.

Cultivate in the universe

In recent years, research on cultivation in the universe is done at the Japan National Space Development Agency etc. In order to cultivate plants by the gravity-free space, it is necessary to supply water and nutrient to roots directly (it is because in the conventional irrigation the ball of water will drift in the air and problems arise). In ceramic cultivation, iit is to supply water and nutrient to roots directly, and water and nutrient moves according to capillary attraction, so solution can be supplied to plants, without being influenced in the gravity direction (weightless conditions). The day when plants are carried into the universe may also become closely.

Commercialization

The LCP (Laboratory Ceramic Plants)

The LCP (Laboratory Ceramic Plants) is the new experimental tool which can make efficient transformations (transgenics etc...). In the LCP, the plants are cultivated with special ceramics.

For such experiment, conventionally, the plants are cultiveted on the vermiculite. Vermiculite is cieved and kneaded. And it is put into viniel pot and covered. But in conventional method, there are some problems. For example, plants are died or get weak. Because we forget supplying water. And transformation efficiency is bad. On the other hand, using LCP, it is no need to sprinkle water. We have to only supply water and nutrient to a cultivation tray about once week. Working efficiency can also be improved, and experiments are speeded. And it is useful to cut of the running cost of an experiment, because the cultivation management after transformation is also easy. We think that it can contribute to development of future biotechnology.

CeraPhyto

'Cera' means ceramics, and 'Phyto' means plants in Latin. So 'CeraPhyto' signifies the plant cultivated with ceramics. They are the goods which are brought the technology of ceramic cultivation to interior design. There is no fear that plants are died from excess water or lack of water. Spilling water on the carpet by irrigation, or spilling soil on the carpet cna be a avoidable. Why do not you decorate the room with small foliage plants. We think that CeraPhyto can provide you relaxation.

Company

Phytoculture control Co., Ltd. is a venture capital. We develop the plants cultivation technology of protecting earth environment, such as planting not only in forest but in desert,and in the universe. The ceramic cultivation technology is developed for planting in dry area as desert etc... Ceramic cultivation technology is the first technology in the world, and patented in many countries, such as Japan and U.S.,Canada, Australia, Europe, and so on.

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