Roses are being sold regardless of the season, all year round. The first flower buds appear in 25-30 days after planting.

Cultivating of rose seedlings

There are many ways to grow roses. There are two ways to lay a foundation for a rose plantation. The first is to root the cuttings of roses in cubes. The second is to plant the scion on the rootstock, that was previously grown in a cube.

Cuttings in cubes take root for several weeks. The plants are transplanted into mats, when white roots on the underside of the cubes appear visible and are about 5 mm long,

The seed method is used to grow roses that produce full seeds, as well as to develop a new variety or when processing rose hips for grafting as a rootstock. "Full seeds" are those, from which, when sown, a flower grows of the same quality as the previous one.

Don't use the seed method when propagating hybrids. Descendants obtained with this method grow up different from their parent. When propagating non-hybrid varieties by seed method, the descendants get similarity with the original "wild varieties". Seeds of miniature roses are best suitable for planting.

Grafting of roses on a rosehip

When cultivating roses in a greenhouse, you can not only do it by growing seedlings from different substrates, but also by grafting. Usually, cuttings are grafted to a rosehip. Propagation of roses by grafting makes business grow, hence you can get stronger plants with large flowers at any time of the year.

It is better to do the grafting when the flow of sap begins at the rootstock. This is due to the need of easily separating the wood from the bark. The end of summer is the appropriate period. You can do this procedure at the end of spring, before the buds blossom. It is also possible to graft in winter, you only need to prepare the rose hips in advance and keep them cool along with shoots of roses.

You can graft roses using various methods:

• *Shield-budding* is one of the most common methods of grafting a rose on a rosehip in a greenhouse;

• *Awl* is also a simple and convenient way. To perform it, you need to choose the place of grafting in the bark of the rosehip, make an incision and put a rootstock into it. Then make sure to attach it to the plant;

• *Slanting* is the joining along the oblique cut of the graft and stock. Plants are pressed against each other and wrapped. You need to fix the place of attachment from the bottom up.

There are several recommendations on plant-grafting. Use only resistant varieties of roses and rosehips.

Speaking about growing roses in a greenhouse, you need to focus on a few points. The first point: you need a tall greenhouse, with compliance to all the most important conditions for growing roses. Growing roses requires a favorable greenhouse microclimate. It must meet the following parameters:

• Proper temperature mode;

• The required humidity level and drip irrigation;

• Sufficient area, comfortable distance between plants;

• There should be good ventilation in the greenhouse.

The second point is the choice of variety. If you are new to growing roses, start with varieties that adapt well to the greenhouse conditions.

Planting

Few days before planting of the seedlings, place the mats onto the trays for growing, and cut out openings following a template (according to the number of seedlings, density of planting) to make place for the mineral cubes or "plugs" of mineral wool or coconut shavings. In the future, this "envelope" is used to cover the ends of the cube to prevent infection or contamination of the mat. Cut out holes completely, when using special plastic covers.

A drip is installed in each hole. Then turn the drop system on and saturate the mat with the nutrient solution, usually for two days. Then, leave the saturated mats for plants to soak in for two to three days. Usually, in order to reduce high transportation costs for the delivery of seedlings, they are carried so-called gags. One day before the main planting, such plants are preliminarily planted in standard cubes of mineral wool, with holes for the cover, with a seedling. In this case, also saturate the cube in advance with nutrient solution using a tub or other container.

After this, place the cubes on the mat, in the holes, and install droppers inside them. Use special plastic covers to strengthen the way cube hold to a mat. The position of the seedling in the mat is of great importance to the development of the rose bush. The new lateral bud of the seedling will face as if inside the mat, since the first bending will be carried out in the direction of growth of this shoot.

Pruning of a rose bush and cutting of flowers

When considering the pruning of a rose bush, it is necessary to know a number of specific terms used by specialists. Most of the terms come from Dutch specialists:

1. "Foliage leaves" - the vegetative mass of the bush, is formed by bending the shoots down. This is intended to increase the productivity of photosynthesis.

2. "Bent" - a shoot with or without a bud (blind shoot, brush), which was bent down from the point of growth and which is located below the "bud union".

3. "Peduncle" - a shoot with a bud, from which we get a commercial rose flower eventually.

4. "Bud union" - a place on a rose bush, from which new shoots and peduncles grow.

5. "Blind shoot" - a peduncle without a bud.

6. "Bull's head" - a peduncle with a bloom, located at an angle of 30 - 90 ° to the shoot.

7. "Vegetative bud or eye" is a thick peduncle stem, from which a main canes are formed.

8. "Main cane" is a branch, the main locations for cutting are located on it. The main cane is refreshed periodically.

The shaping of a rose bush begins at the time of planting the seedlings to a permanent place and lasts the entire lifetime of the bush. It is inextricably linked with the cutting of peduncles. Cutting of the peduncles is an integral part of the bush shaping.

The seedlings are turned in the direction of the first bend at the time of planting. Correct bending greatly affects the further shaping of the bush and its productivity. Errors made during the execution of the first bend are very difficult or impossible to correct in the future. If the shoot was broken, wait 4-6 weeks until the following grow. If the fracture occurred below the growth point, this means the death of the entire bush.

Bend is performed as low to the first leaf as possible. A high bend towards the first leaf stimulates the development of 2-3 buds. As a result, shoots are thin, which leads to a decrease in the productivity of the bush and a decrease in the quality of the flowers.

The first bend is usually performed through the mat of the row, to balance the position of the cube on the mat. Bending is carried out when shoots reach 4-6 weeks of age - a bud with a visible color appears. The bud must be removed prior bending. Sometimes, depending on the type of rose, the bud is removed from the shoots to allow the growth of 2-3 lateral buds. In this case, the bend is performed after the growth of leaves on the lateral buds.

Technological operation of bending the shoots is better carried out in the afternoon, when the plant turgor is weakened. It is not advised to so in the morning, as a lot of shoots will be broken.

When choosing a single-row scheme, the bends are performed to both sides of the bed. This way, the position of the bush on the mineral wool mat or other substrate is balanced, and creates a powerful efficient foliage on both sides of the bush. Leaves shade each other minimally with this arrangement.

The use of a two-row planting scheme provides for the execution of the bend in the main direction to the walkway and only a small part of the shoots is directed into the beds, in order to stabilize the bush on the substrate. In this case, the foliage comes out in many layers and a significant part of it is obscured by other leaves.

Cuttings of peduncles also need to be considered as an element of the shaping of the bush. Usually, a method of pruning into one bud or one leaf is considered. For many varieties, a "high" prune for 2-3 leaves is used.

The caring for peduncles is of fundamental importance. It consists of removing lateral buds from axils of leaves. If you remove it too early, when the lateral buds are less than 3 cm in length, this will lead to the development of new buds and, accordingly, the amount of work increases. Later pruning leads to unproductive drain of the plant. In both cases, plants lose productivity.

Taking care of the foliage is an important job. It consists of the following: removal of buds, weeds, cutting of dry branches, removing of the fallen leaves.

Buds from the foliage should be removed in the earliest stage, that is, not more than 5 mm in diameter. Since the buds take a lot of energy and photosynthetic products from the foliage, this significantly reduces the number and quality of peduncles intended for actual commercial flowers.

Weeds must be removed as they come, as they take away part of the water and mineral nutrition from roses, and also aggravate air ventilation in the lower part of the bush.

Cutting out dry branches improves the light cycle of the foliage and, accordingly, the efficiency of the photosynthetic apparatus of the bush, and also prevents the development of rose diseases.

Removing the fallen leaves is also an important action, especially in terms of plant protection. There may be pests under the fallen leaves (whitefly, thrips, spider mites).

The refreshment of the foliage is carried out by cutting the tips of branches (shoots) by 5-10 cm to stimulate the emerging of new shoots with young vigorous leaves (in terms of photosynthesis) on them from the axils of the old leaves. Thus, the total area of the photosynthetic apparatus increases, and, most importantly, the productive capabilities.

Cutting of roses, cooling, sorting, storing and transporting roses

Cut the roses every day, from 7-8 am to 11-12 am.

In late spring, summer and early autumn, it is best to cut roses twice a day, this is determined by the rate of flower-bud opening.

For most varieties of roses, the flower is ready to be cut if all the petals of the flower-bud stand out. This is of course the second or third stage of flower-bud opening.

Cutting of roses is done with a special pruner. The pruner should be sharp, so as not to crumple the stem of the rose. If the stem of the rose is crumpled when cut, this makes it difficult for water to enter the stem after cutting, leading to a decrease in shelf-life and may not allow the bud to fully open.

The time passed after the rose was cut down and placed in the water should not exceed 30 minutes. Otherwise, there is a occlusion of the conducting vessels, which leads to premature withering of the rose.

After cutting, roses in special liners or canvases are placed in a tub with a solution of special drugs, the temperature of the solution should be 6-8 ° C. Therefore, the tub must be filled with a solution on the evening before and cooled in the refrigerator through the night.

As the tubs are filled with flowers, they are immediately sent to the refrigeration chamber with the temperature of 8 ° C and relative air humidity of 75-80% for the cut flowers to soak up. During this period, inhibition or complete stopping of biological processes (breathing, evaporation of water) occurs in cut flowers, disinfection of the cut from putrefactive bacteria. In addition, cut roses absorb a solution of special preparations containing antibacterial and nutrients (amino acids, sugar, etc.)

Sorting of flowers

Sorting can be:

• Manual

• Automated

In both cases, the flowers of the rose are sorted:

• by length of the peduncle

• by bud size

• by the ratio of the size of the bud and peduncle

• The degree of damage to diseases and pests.

Reject roses:

• with a defective opening of the flower-bud (petal fracture, two apexes),

• Curved peduncles,

• with bull's heads,

• with leaves damaged by powdery mildew or pests,

Sorting of flowers is carried out in a room with a temperature of no more than 14-16 ° C. Picked roses make up into bouquets of 10-20 pieces. Bouquets are packed in a special perforated film for better ventilation of flowers.

Packed bouquets are placed in special containers for wet storage. Containers with roses are sent to the refrigerator store for a minimum of 6-8 hours. Storage temperature is 2-4 ° C at relative humidity of air no more than 75-80%.

Top dressing with CO_2

Carbon dioxide top dressing, that is, enrichment of the greenhouse atmosphere with carbon dioxide to 0.05-0.07% during the daytime, increases the efficiency of the assimilation apparatus, that is, photosynthesis. This is especially important in the periods of the year (autumn, winter, early spring), when the windows are closed, the air exchange is low, therefore, the productivity of photosynthesis is harshly reduced, efficiency decreases.

Feeding plants with carbon dioxide increases the yield and quality of products by about 30%.

Grow light for roses.

Year-round growing of roses is based on using grow-lighting method in the autumn-winter-spring periods of the year. When arranging supplementary lighting, the light day during the illumination period reaches 20 hours per day.

Duration of lighting roses with AgroLED lamps

Month	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
hrs	20	18	16	10	8	-	-	-	6	8	10	20

Irrigation and fertilizing of roses

When following a low-volume method, it is necessary to constantly maintain sufficient moistness of the substrate, due to its small capacity. Reducing the humidity of the substrate leads to stress, which can happen during day or night. You can maintain a high moisture level with frequent and small irrigation rates.

Since plants need proper air exchange in the root system, substrates in humid conditions must have a sufficient level of air capacity, optimally 30-35% with full saturation of the substrate with water.

When overflowing the water-intensive layer of mineral wool, the root system begins to die out, there is decrease in yields. When the air temperature is high and the transpiration ratio of the leaf mass of plants is correspondingly high, multiple watering is performed.

For most roses, the optimal EC in the substrate should not exceed 2-2.2 and pH 5.2-5.9.