

5.2. White Marshmallow (*Althaea Officinalis*)

Usually sold as:

Althaea Folium - The Leaf of the white marshmallow

Althaea Flos - The flower of the white marshmallow

Althaea Radix - Root of white marshmallow

White Marshmallow can be found near large rivers, moist landscapes, and near roads as wild plants. Due to an ever-increasing demand for white marshmallows during the recent years, in addition to natural growth, white marshmallow is now being systematically cultivated. In the cultivated versions of the marshmallow, the roots are stiffer, wider and have more mucus than the naturally growing version.

The Morphological and Physiological Characteristics

White Marshmallow is a long-living plant with a strong root system. The roots are branched and are light-brown in the outside and white in the inside. The head of the roots gives rise to stems which reach 1.5 to 2.0 meters in height.

Please see picture.



The chemical composition and the uses for the white marshmallow

Since the ancient times, the white marshmallow has been considered as natural medication. In our country, it is used in folk medicine as well as scientific medicine. The root is the most sought-after part of the marshmallow and it is used to medicate the respiratory tract and it is used to stop coughing. Furthermore, the marshmallow is also used to make a variety of teas. In the roots of the white marshmallow there is a 30-35% mucus secretion, nearly 35% is starch, and there are also some deposits of saccharine, pectin, etc.

Cultivation Conditions

Climate: Marshmallow is plant of continental climate. It develops especially well in soft climatic conditions, and it is not sensitive to low temperatures during winter. The optimal conditions for its development are in areas where the annual precipitation exceeds 600mm.

Soil: To cultivate the white marshmallow, the selection of the soil for plantation is a vital step towards success. Its yield-rate is the highest in black-dirt soils that have a light mechanical composition and in all other soils that have a good mechanical composition. With this it is desirable that the underground-flowing water is channeled towards the marshmallow's active root area. We must not plant white marshmallow in soils with heavy mechanical composition. The white marshmallow's highest yield-rates are in rich soils. To plant the white marshmallow, we can use soils which are periodically flooded. The white marshmallow can survive under water without any damages for 10-15 days.

Cultivation

Plant Circulation - The white marshmallow can last one year in the same parcel, two years at most. It does not tolerate monoculture and should be cultivated by switching with other cultures. The changing of cultures should be done in a way that it takes 3-4 years for the white marshmallow to arrive back to its original place. An important factor for the successful growth of the white marshmallow is that the previously-cultivated culture has left a soft ground which is clean from weeds. Developing the white marshmallow is most successful when its cultivation site was previously host to cultures that were treated with organic pesticides.

Working soils - it has strong and branched roots which run deep underground, so the main purpose of the tilling process would be to create deep tilling layers so that the root system would develop without any obstacles. The soils for the white marshmallow must be tilled in early autumn. The depth of the tilling is relative to the type of ground, but it should not be less than 30-40cm deep. If the marshmallow is planted in autumn, immediately after the tilling, the parcel must be cultivated. If it is planted in spring, larvae remains open in the flat part, and in spring before the planting, the surface-cultivation takes place.

Fertilization - The parcel planted with white marshmallow should not be directly fertilized with organic fertilizer; it suffices that the previous culture was cultivated with organic fertilizer.

Reproduction - There are several ways to reproduce the white marshmallow, but the following methods are most white:

- Direct plantation through the seed.
- The Production of Seedlings in cold parcels and their transplantation.
- Plantation with pieces of the roots' head from old plants.

Direct plantation with seeds - is done in the Autumn in November or early December when there is no chance that the seed will flourish in Autumn. If this timeframe has passed, then the planting should take place in Spring, towards the end of February. Regardless of the time of the year that the marshmallow is being planted, the parcel must be well-prepared, and the ground should be tilled thoroughly. The planting should take place with appropriate machinery with rows 50-70cm apart. It should be planted 1-2cm deep. For direct planting via seeds, for 1 hectare of land, it requires 3-4kg of seeds. The seed of marshmallow flourishes slowly. For 4 weeks of active temperature, only 50-60% of the seed flourishes. After flourishing, the in the beginner-stage of development, white marshmallow develops slowly and this is the reason why a special type of care is necessary since the first day. This method of plantation may be considered only for growth in parcels that are free from previous cultures' weeds and from their roots, or else its chances to grow successfully are slim.

The production of seedlings - in cold parcels, and their immediate transplantation in open fields is expensive but it remains the most credible method of cultivation of the white marshmallow. In cold parcels, the seed is planted during the first half of the month of July. The planting is done in a scattered pattern or in rows with distance of 15-20cm between them. To plant one square meter in a parcel, we need 3-4grams of seeds. The parcels are watered regularly and in these conditions, the seeds will flourish within 21 days. The seedlings will remain in the cold parcels until transplantation and until the plants grow 10-12cm tall and have 4-6 leaves. From one square meter of the parcel, we can acquire 200-300 white marshmallow seedlings. This means that to plant one hectare of marshmallows, we need a cold parcel of 200 square meters. The seedling acquired in this form is planted in a permanent location in early autumn usually after the first substantial rain. The planting is done by hand in distances of 50-70cm from row to row and 20-30cm distance from column to column. Through this method, to plant 1 hectare, we need 50,000-66,000 seedlings. During the plantation in distances 70cmx30cm, we need 66,000 seedlings, while for 70cmx20cm; we need 71,400 seedlings per single hectare.

Marshmallow reproduction via Root parts - is the simplest. When pulling roots from old plants, the heads of the budded roots are chopped; if the root has a lot of buds, the root is cut in many parts which have 2-3 buds each. The distance from plant to plant is same as in the seedlings produced in cold parcels. To plant one hectare, we need 800-1000kg of root heads depending from their size.

Care-taking

Cultivation and removal of weeds - in plants that are planted with seeds, it begins as soon as the first rows can be noticed. When the plants have 3-4 leaves, the first cultivation between rows can be completed. The second cultivation is done 3-4 weeks later when the plant reaches 20-30cm in height. After the second cultivation, the white marshmallow grows fast, and it branches in a manner that with

its own crown-surface it fights bad weeds. They should be positioned so that the distance from plant to plant within a row remains within 20-30cm.

Harvesting - From the white marshmallow, we take advantage of their roots, leaves and flowers. The root is taken out/ harvested during the first year and the second year of the cultivation and it should be done either during the first year in autumn or the following year in spring. During the third year, the root of the marshmallow starts to lose weight and quality and that's why it is preferred that the white marshmallow should be cultivated only as a two year plant.

Leaf - during the year the marshmallow can be harvested for leaves two to three times a year. It is best to be harvested before flowering and during the flowering stage. Only the healthy and uninfected leaves are harvested. During the first year, we must be careful to not harvest more than 1/3 of the total amount of leaves so that we do not endanger the further development of the plants. In the second year the harvest can be larger than the harvest of the first year. The harvested leaves are dried in a thin layer in a dark place and with air currents/professional dryer currents of 50 degrees Celsius. From six kilograms of wet leaves we can gain one kilogram of dry leaves. For the drying process, we can use tunnel greenhouses as well.

Flowers - are harvested during the first and second year of the cultivation. The harvested flowers are left to dry in the sun. From 6kg of fresh flowers, we can gain one kilogram of dry flowers.

The root of White Marshmallow - are taken out during autumn, in October or November, and also throughout winter, and if the climatic conditions allow, until March. The best method for taking out the roots is with a plow where the ploughshares are removed. With this plowing, the roots are severed and do not twist in the event when the farmer gathers the plowed roots. From the gathered roots, we immediately remove the budded root parts. Meanwhile, we also remove the weak or undeveloped roots. This root, prepared in the aforementioned method, is then cleaned with cold water. This type of material is delivered in a depot where it remains for a short period of time so that it can undergo drainage and then undergoes skin removal. The skinless root is cut vertically, usually in four parts. Then it is dried in a thermal dryer in temperatures from 50-60 degrees Celsius. These roots can be dried in a natural manner but the root will not have good color when dried naturally. The well-dried white marshmallow root has a white or shiny yellow color. From 4kg of fresh root, we gain 1kg of dry roots. The dry stem of the white marshmallow is cut in squares.

Yield - the white marshmallow yield is closely related to the agro-technical measures applied during its cultivation. From 1 hectare we can extract 1200-2000kg of dry roots, 500-600kg of dry leaves, and nearly 150kg of dry flowers. The price for 1kg of dry white marshmallow roots is approximately 5-6 Euros.