

THE MOLDING PRUNING TECHNOLOGY OF DECORATIVE SHRUB FOR CREATING CLASSIC TOPIARY FIGURES IN CONDITIONS OF UZBEKISTAN

¹Feruzha Ulugbekovna Rashidova, ²Regina Askarovna Lapteva

¹Doctoral student, Tashkent State Agrarian University

²Assistent, Tashkent State Agrarian University

<https://doi.org/10.5281/zenodo.7786496>

Abstract. *The article presents the results of scientific research obtained during the study and implementation of molding pruning of ornamental shrubs to create topiary compositions in accordance with the soil and climatic conditions of Uzbekistan. In the process of work, the features of the molding pruning, the main aspects, techniques and methods, the stages of formation of topiary figures are identified, as well as attention to the conduct of subsequent pruning to maintain the specified shapes.*

Keywords: *topiary art, topiary figures, technology of creation and formation, molding pruning, thinning, decorative shrubs, assortment of shrubs, cube, ball (sphere), cylinder, pyramid, cone, spiral.*

The actuality of research work. The article presents the results of scientific research obtained during the study and implementation of molding pruning of ornamental shrubs to create topiary compositions in accordance with the soil and climatic conditions of Uzbekistan. In the process of work, the features of the molding pruning, the main aspects, techniques and methods, the stages of formation of topiary figures are identified, as well as attention to the conduct of subsequent pruning to maintain the specified shapes. Nowadays in Uzbekistan, the creation of classic topiary figures from woody and shrub vegetation by molding pruning has become a popular trend in landscape design. Topiary compositions can be used in garden parks of different styles: Japanese (Bonsai and Niwaki), Art Nouveau (columns and spirals), avant-garde (cubes, spheres and pyramids). In this connection, there is an urgent need to develop technology for the creation of topiary compositions in accordance with the soil and climatic conditions of the region.

The aim of research work. Developing a technology for molding pruning wood and shrubs when creating topiary figures, using the main methods for this type of work

The methods of work. The artificial shapes were given by the molding pruning of ornamental tree and shrub crops by G.Beltz method "Figure cutting of trees. Forms. Methods. Care" (2008). He argued that the longevity and reasonably stable size of trimmed plants gave an undeniable advantage over free-growing plants without an aesthetic appearance. To study the formation of figured forms of the crown and trunk, the principles of pruning woody and shrub vegetation, data from the training manual of A.I. Koveshnikov and N.A. Shiryaeva «Ornamental plant growing. Fundamentals of Topiary Art» were used. The method of V.S.Theodoronsky and I.O.Bogova «Landscape architecture» (2010) and V.S.Theodoronsky and V.L.Mastrovsky «Landscape Architecture and Garden Art» (2001) were used in carrying out research on the architectonics of shrubs. The work involved F.N. Rusanov (1968) on selection of perspective assortment for reconstructed Tashkent. The main techniques of decorative molding

pruning were carried out according to the method specified in the practical edition of R. Bird «Practical pruning and forming of trees, decorative and fruit shrubs» (2016).

Discussion of research results. Topiary art is based on shaping shrubs with molding pruning. These forms can be both simple and complex, multi-component. Simple shapes include a cube, a ball, a cylinder, a pyramid, a cone, a spiral, etc. Complex shapes include pom-poms, a poodle, a ball on a thin trunk, a box on a trunk, etc. The principle of shaping these figures differs only in that in complex figures a stem is formed at the preliminary stages of creation, and the direct formation of the crown is carried out using a similar technique with simple forms. Therefore, this article provides a technique for the formation of simple figures.

1. Cube. This topiary figure is created as a structural element of the garden and a symbol of the change in the natural appearance of shrubs. This figure looks more effective in a landscape composition in combination with other artificially given simple geometric shapes (cone, ball, cylinder). The plants used to create this form should be small-leaved, with a dense crown, as well as well tolerated forming pruning. They are used in greening landscape gardening territory. of modern, Mediterranean, regular style.

Assortment of shrubs: boxwood, common ninebark, shiny cotoneaster, mountain hawthorn.

Technology of creation and formation. To create a topiary figure of the “Cube” shape, 2 technologies can be used (*Fig.1.*):

- creation and formation of a topiary figure by molding pruning of an adult shrub growing on the site;

- creation and formation of a topiary figure by planting young seedlings, followed by their molding.

When creating a figure by planting seedlings, it is necessary to mark a square on the territory with the help of pegs. For planting, we use a minimum of 5 shrubs, planting 4 bushes at the corners of the square and one bush in the middle. Immediately after planting, the shoots should be shortened by 1/3 or 2/3. The formation of the figure begins the next year after planting, as the seedlings must take root and settle down. The next stage of creating a figure is identical for both technologies, with the difference that for an adult bush it is necessary to outline the shape of a square on the ground. In the corners of the selected square, we set wooden rails, holding them horizontally. The length of the rails depends on the size of the intended figure. You can also use a ready-made metal frame created from the chain-link mesh, with mesh sizes of 1x1cm. The first step in the shaping pruning is to make a rough cut to create the outline of the cube. In the conditions of Uzbekistan molding pruning is carried out by medium shortening technique in March. Begin pruning at the top of the figure, moving to the sidewalls, shaping 3-5 cm above the frame. This is done to prevent gross errors and maintain a clear shape of the figure. Next, we carry out a finishing cut directly along the contour of the frame using a water pass (level), to ensure that the horizontal and vertical surfaces of the figure are perfectly aligned. We carry out a visual inspection of the resulting figure. If any stumps, damaged branches or half-timbered leaves are left on the outline, they must be removed by thinning techniques so that the figure does not lose its decorative appearance. In the conditions of Uzbekistan, the following molding pruning is carried out in early March, before the start of sap flow. We carry out an intermediate cut if necessary (in the case of using fast-growing breeds) in June, and the last cut in September - October. In order to maintain the specified height parameters of the figure in subsequent years, it is possible to make a molding

pruning technique by pinching top surface of the figure in March, which will slow down the growth of the figure in height.



Fig.1. Creation and formation of a topiary figure «Cube»

2. Ball (sphere). This figure is quite difficult to create and shape, as it is not possible to perform a molding pruning on the moulds. The parameters of the "Ball" figure are easier to select based on the size of the applied plant. The plants used to create this form should be small-leaved, with a dense crown, as well as well tolerated forming pruning. Topiary figures of this form are used in the creation of landscape design of Mediterranean, historical, modern formal parks, as well as rustic gardens.

Assortment of shrubs: common ninebark, gray spirea, Vanguetta spirea, hawthorns, shiny cotoneaster, common barberry and Thunberg, small-leaved holly, evergreen boxwood.

Technology of creation and formation. To create a topiary figure of the "Ball" shape, 2 technologies can be used (*Fig.2.*):

1. Loose cut
2. Creating a shape from others (cube, cylinder)

When using the first technology, we make a cut "by eye", in compliance with the sequence of forming pruning. We make a rough forming pruning of this figure with medium technique, cutting a straight line. Initially, the base of the plant is sheared, and the side shoots are shortened. The second step is to cut the top of the bush, thus we set the figure's height. Next, we cut the lateral shoots of the upper part of the bush, and lastly, we form the side surfaces, giving the figure a volume corresponding to the height. When moving from one stage of cutting to another, it is necessary to visually check the parameters of the figure obtained during the trimming, so the height of the figure should correspond to its width. Next, proceed to the final pruning, rounding the obtained corners.

In the process of creating the "Ball" shape using the second technology, it is possible to use auxiliary tools (moulds), which facilitates the work. In the first variant of this technology, it is possible to form the shape of a "Cube" or "Cylinder" using the technique of medium shortening according to moulds. Then we proceed to the finishing cutting by slightly shortening. First, the corners are truncated, then we cut the figure "by eye", retreating from it a couple of steps. In the conditions of Uzbekistan molding pruning is carried out using the medium shortening technique in March, before the start of sap flow. We carry out an intermediate cut using a weak shortening technique in June, and the last cut in September - October. If it is necessary to maintain the given dimensions of the figure, molding pruning is carried out using the thinning technique - tweezing along the entire crown of the shrub, which will slow down the growth of the figure in height and encourage the growth of lateral branches, which will give the figure greater density. This process in the conditions of Uzbekistan is carried out in June. If there are old, weakened branches on the

bush, they can be removed by the thinning technique - a cut into a "ring" in March, June - depending on their location.



Fig.2. Creation and formation of a topiary figure «Ball (sphere)».

3. Cylinder. The topiary figure of the "Cylinder" shape is created by molding pruning of the formed shrub, as the application of young plants will take more time to fill in the form. Also, it is necessary to take into account its placement on the landscaped area, as an important condition is even lighting of all its sides. The advantage of this figure is the ability to grow it in height, although acropetal growth often leads to a change in the parameters of the figure, which requires more care. These figures are used in urban landscaping in Mediterranean, formal, historical, modern style contemporary garden areas. Also, these figures look good when decorating the entrance and alley areas.

Assortment of shrubs: snowy mespilus, bird cherry, boxwood, privet and other evergreens that tolerate mold pruning well.

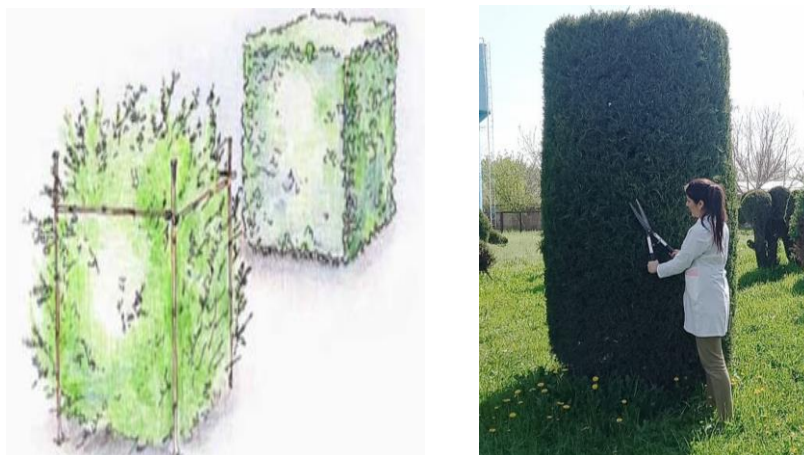


Fig.3. Creation and formation of a topiary figure «Cylinder»

Technology of creation and formation. To create this figure, it is necessary to use auxiliary materials - guide rails. The first step in creating the shape is to mark the base in a circle on the ground around the plant. The diameter of the circle is selected depending on the habitus of the shrub used. To create a frame around the perimeter of the circle, we install guide rails in an amount of at least 6 pieces. To facilitate work, you can stretch the chain-link mesh around the rails, or fasten the vertical rails with additional horizontal wires. The molding pruning of this figure begins with a rough cut using the medium shortening technique (Fig.3). In the conditions of Uzbekistan, this procedure is carried out in March before the start of sap flow. When carrying out a rough haircut, it is necessary to deviate from the frame at least 5 cm or 3 buds, to be able to correct errors. We start the molding pruning from the top of the figure. Passing to the side part - column, it is necessary to regularly go back several steps and visually check the contour of the resulting circle. If the plant has damaged, shriveled branches, they must be removed by the thinning technique -

cut into the ring. Finishing molding pruning is carried out using the technique of weak shortening along the contour of the frame. To align the horizontal and vertical surfaces of the cylinder, we use the water pass (level). Subsequent molding pruning is carried out in June (if the intensive growth of shoots violates the proportions of the figure). If it is necessary to maintain the height of the figure, molding pruning is carried out using the thinning technique - tweezing in the conditions of Uzbekistan in the month of June.

4. Pyramid. The creation of a figure is carried out by molding pruning, and the figures can be either triangular, quadrangular, or hexagonal. Plants for this figure are selected in large sizes, as the shape has a square base. They are used in urban landscaping of modern, historical, formal and Mediterranean parks.

Assortment of shrubs. Boxwood, common hawthorn, mountain hawthorn.

Technology of creation and formation. To create a figure (Fig.4), it is necessary to outline the base of the pyramid on the ground around the bush. At the corners of the figures are mounted wooden rails, which must be connected at the top. The number of guide rails depends on the number of corners of the figure. To give strength to the resulting frame, you can wrap it with a chain-link mesh, or additionally connect it with rails, which will serve as a guide for further formation. We make a cut smoothly on all planes, periodically distancing from the figure in order to visually evaluate the result. In the conditions of Uzbekistan molding pruning is carried out by the technique of weak shortening in March. In the presence of old, weakened, shrunken branches, it is necessary to remove them with the technique of thinning on the «ring» in March. Subsequent cuts, to maintain shape, are carried out from March to April, and if necessary, in September - October (if the figure is out of proportion).



Fig.4 Creation and formation of a topiary figure «Pyramide»

5.Cone. The creation of this figure is similar to the technique of creating the figure «Pyramid», with the difference that the base of this figure is round. The figure «Cone» is easier to create by molding cutting adult shrubs. This figure requires special attention to the top, as because of the intense acropetal growth, it is this part that quickly loses the set parameters and its decorativeness. The figures of this form can be used in the creation of historical, modern, formal parks, as well as the design of portals, entrances, are used as alley landings and landings along fences.

Assortment of shrubs. It is rather sparse, as in most cases shrubs have a spreading or spherical shape. Basically, boxwood or privet is used.

Technology of creation and formation. To create a topiary figure of the “Cone” shape, 2 technologies can be used (Fig.5): 1. Molding pruning of adult shrubs; 2. Create a shape from the figure «Pyramid» by rounding corners.

The process of creating this figure using the first technology is similar to the process of creating the Pyramid figure. We draw a circle on the ground around the plant, preferably calculating the radius, using the main skeletal branch as the center of the circle. To form this figure, you can use both a ready-made stationary frame made of metal, and prepare a temporary frame from rails and a chain-link mesh. To prepare a temporary frame, we set 3-6 rails equidistantly along the intended circle, connecting them at the top of the figure with a wire. Next, we wrap the frame with a chain-link mesh, or stretch the wire horizontally. We carry out rough molding pruning along the installed rails, using the shortening technique, but its degree depends on the habitus of the shrub used. A cut in the lower part of the bush can be done using the weak shortening technique, and starting from the middle to the top, using the medium technique. After rough pruning along the rails, finish pruning the entire shape with the base of the circle and the center of the apex in mind. During the cutting process, it is necessary to carry out a visual inspection stepping away from the figure to evaluate the result. To obtain a more symmetrical shape, you can use the water pass (level), measuring the angle of inclination of each side when cutting it. If there are shrunken, diseased, overlapping branches in the crown, we remove them by thinning - a cut "on the ring". Shaping of this figure is carried out in March before the start of sap flow. Since, due to the characteristics of the growth of shrubs, this figure quickly loses its decorative effect, it is necessary to carry out intermediate pruning several times during the growing season. When using the second technology for creating the "Cone" figure, we carry out molding pruning of the finished "Pyramid" figure, rounding the corners with the technique of medium shortening. Finishing pruning is carried out using the technique of weak shortening, adjusting the symmetry of the shape with the help of water pass (level), measuring the angle of inclination of each side during its cutting.



Fig.5 Creation and formation of a topiary figure «Cone»

6. Spiral. There are various forms of spirals: "Spindle", "Screw" ("Corkscrew"), a spiral with a twisted barrel. The "Spindle" shape is obtained if the distance between the turns of the spiral is large, in the case when the distances are small, the "Screw" or "Corkscrew" shape is obtained the spiral is initially formed from the "Cone" figure, provided that it has sufficient height.

Assortment of shrubs. More often, when creating these topiary figures, trees are used; to get this shape from shrubs, shiny cotoneaster and small-leaved boxwood are recommended

Stages of creation and formation. The first step in creating the "Spiral" figure is the formation of the "Cone" shape, using the technology described above. This figure is formed over several years, because as the shrub grows, it has side shoots that break out of the given shape. To create a topiary figure of the "Cone" shape, 2 technologies can be used (*Fig.6*):

1. Arbitrary formation (with the help of rails)
2. Formation of curved lines (with the help of ribbons)

In the case of the arbitrary formation of the “Spiral” figure, in the first year we draw a circle around its base on the soil, on which we install auxiliary rails connected at the top of the figure. On the rails we make marks of tiers that will help in the course of shaping the figure. We cut the tiers according to the marks on the rails, using the thinning technique - a cut “into a ring” along the contour, rounding them spirally from one tier to another. In the first year, we make a rough molding pruning of the resulting tiers, using a shortening technique to a weak or medium degree. The main factor in the creation of the topiary form "Spiral" is the organic relationship between the parameters of the tiers and the overall height of the figure. In subsequent years, the formation of the figure is carried out by technicians of weak shortening in the conditions of Uzbekistan in March. If the raw material - shrub, has sufficient density, then tiers can be formed using ribbons. We tie the tape to the lower part of the trunk, wrapping it around the plant, fixing it in the upper part. We correct the angle of inclination of the ribbon and the distance between the turns so that the tiers have approximately the same height. We cut out the contour of the tier using the thinning technique - a cut “on the ring”. In the first year, the formation of the figure takes place with the help of rough molding pruning of tiers - the technique of weak or medium shortening based on the size of the shrub. In the conditions of Uzbekistan, it is necessary to carry out in March. In June, we carry out additional molding pruning to remove the thickened shoots of the central axis, as well as to make the tiers clear. In subsequent years, we carry out molding pruning of tiers by shortening as necessary.

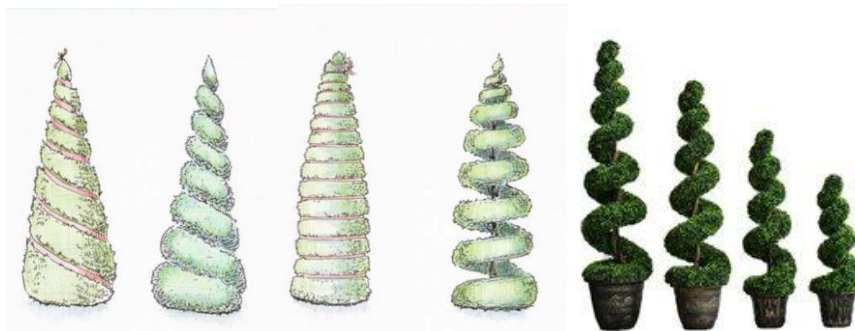


Fig.6 Creation and formation of a topiary figure «Spiral»

Conclusions. In this connection, there is an urgent need to develop technology for the creation of topiary compositions in accordance with the soil and climatic conditions of the region. Ornamental molding pruning is done taking into account the biology of the plant's development and growth and in accordance with the climatic conditions of the region. Shaping technology is different. There are main stages in the formation of topiary compositions, which include initial molding pruning and subsequent supporting pruning. In this case, two techniques are used: shortening technique (weak, strong, medium); cutting technique (slicing on the ring, pinching). Depending on the spatial orientation of the naturally growing branches, certain technologies are applied for each figure. In the course of the study, the period for the formation of each figure was determined, which corresponded to the soil and climatic conditions of Uzbekistan, which makes it possible to introduce these technologies into the landscaping system of the country's garden and park zones.

REFERENCES

1. Бельц Г. Фигурная стрижка деревьев. Формы, методы, уход/Пер. с нем. – М.: ЗАО «БММ», 2008. – 128с.

2. Берд Р. Практическая обрезка и формировка деревьев, декоративных и фруктовых кустарников. Издат-во: Клуб семейного досуга, 2017 г.
3. Ковешников А.И., Ширяева Н.А. Декоративное садоводство. Основы топиарного искусства: Учебное пособие. – СПб.: Издательство «Лань», 2015 – С. 336
4. Русанов Н.Ф. Ведущий и перспективный ассортимент растений для озеленения реконструируемого г.Ташкента. – Ташкент: Фан, 1968. – С. 28
5. Теодоронский В.С., Боговая И.О. «Ландшафтная архитектура» учебное пособие по специальности 250203 "Садово-парковое и ландшафтное строительство" / В.С. Теодоронский, И.О. Боговая. Москва, 2001. – С. 303.
6. Рашидова Ф. У., Кайимов А. Подбор ассортимента вечнозеленых кустарников для создания топиарных фигур в условиях города Ташкента // SAI. 2022. №Special Issue. URL: <https://cyberleninka.ru/article/n/podbor-assortimenta-vechnozelenyh-kustarnikov-dlya-sozdaniya-topiarnyh-figur-v-usloviyah-goroda-tashkenta> (дата обращения: 30.03.2023).
7. Рашидова Ф.У. Использование малых архитектурных форм – топиарных композиций в архитектуре и городском озеленении // Сборник 30-ой Междисциплинарной дистанционной онлайн конференции на тему «Практические исследования в Узбекистане». – Ташкент, 2021. – Часть 13. – С. 7-9
8. Рашидова Феруза Улуғбековна, Горлова И.Г. Технология формовочной обрезки, транспортировки и пересадки сформированной топиарной фигуры из можжевельника обыкновенного (*juniperus communis*) в условиях Ташкентской области // SAI. 2022. №Special Issue. URL: <https://cyberleninka.ru/article/n/tehnologiya-formovochnoy-obrezki-transportirovki-i-peresadki-sformirovannoy-topiarnoy-figury-iz-mozhzhevelnika-obyknovennogo> (дата обращения: 30.03.2023).
9. I. Gorlova, F. Rashidova. Techniques for molding topiary figures from virgin juniper (*juniperus virginiana*) and basic tools // SAI. 2023. №D2. URL: <https://cyberleninka.ru/article/n/techniques-for-molding-topiary-figures-from-virgin-juniper-juniperus-virginiana-and-basic-tools> (дата обращения: 30.03.2023).
10. Рашидова Ф.У., Кайимов А. Технология создания топиарных фигур и применение их в ландшафтном дизайне Узбекистана в целях санитарно-гигиенического эффекта озеленяемых территорий // Международный научный форум INTERNATIONAL SCIENTIFIC FORUM. Кўп тармоқли илмий-амалий анжуман. – Ташкент, 2022. – С. 1074-1078.
11. Rashidova, F., Lapteva, R., Kayimov, A. (2023). Topiary Art: Basic Principles Forming Decorative Plants for Creation of Topiar Figures. In: Beskopylny, A., Shamtsyan, M., Artiukh, V. (eds) XV International Scientific Conference “INTERAGROMASH 2022”. INTERAGROMASH 2022. Lecture Notes in Networks and Systems, vol 575. Springer, Cham. https://doi.org/10.1007/978-3-031-21219-2_218
12. Rashidova, F. U. . (2021). The Technology Of Creating Topiary Compositions With The Participation Of Ornamental Shrubs - Frame Topiary In The “Green Art” Style. The American Journal of Agriculture and Biomedical Engineering, 3(05), 39–44. <https://doi.org/10.37547/tajabe/Volume03Issue05-08>