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Cultivation of magnolia and analysis of its application in landscape design

Li Yunyun

Anhui Technical College of Industry and Economy, Hefei, Anhui, 230051, China

Abstract: *With the comprehensive development of social economy and the increasing improvement of people's quality of life, the beautification and sustainable development of the environment are also gradually being paid attention to, and are meeting the direction of diversification, ecology and speciality. This article starts from the characteristics of magnolia, and firstly elaborates the collection and seeding, seedling grafting and spring, summer, autumn and winter management of magnolia, and then analyses the application of magnolia in landscape design, including the application principle; application of planting, scope; application of the results, etc. Finally, on the basis of the detailed analysis and complete demonstration, it builds up a comprehensive system of evaluating the application effect of magnolia in the landscape. The overall article advances layer by layer and decomposes step by step, providing a solid and scientific research foundation for the better application of magnolia in landscape.*

Keywords: *magnolia; cultivation; landscape design; application analysis*

1. Introduction

Magnolia, also known as magnolia, lotus magnolia, large-flowered magnolia. It is mostly planted in the region south of the Yangtze River because of its preference for a warm, moist and slightly acidic soil environment. It is a beautiful tree with large and thick leaves (dark green in colour), white flowers like lotus (the radius of the flowers is about 7.5 to 10cm, and the flower pieces are generally nine to twelve), red fruit kernels, evergreen for four seasons, pleasant fragrance, and is resistant to wind and dust, pollution, pests and diseases, and has a lot of medicinal value, and so on.

Magnolia has a pure and elegant temperament, signifying the endless life of all things. It was selected as Hefei City, Tongling City, Changzhou City, Nantong City, Kunshan City, Zhenjiang City, Yuyao City, etc. It is a high-quality greening ornamental tree species, and is commonly used in landscape configuration.

2. Cultivation of Magnolia

2.1 Breeding

2.1.1 Collection and sowing

In September and October every year, when the seeds of magnolia are ripe and show their red seed coat, they start to collect them, soak them after collection, then dry them in the shade (avoid drying them in the sun), and finally sow them. Sowing time is chosen at the right time (can be sown immediately after picking, or sown in the spring of the following year), and an environment with good sunlight, sufficient water and fertile land should be chosen, and watering should be done at the right time, so as to promote the seedling emergence of the seeds.

2.1.2 Seedling grafting

Magnolia seedlings grow slowly, so they should pull weeds, replenish seedlings, set plants, loosen the soil, irrigate (usually not irrigate in late autumn and winter), add fertiliser, etc., to promote rapid growth of seedlings. If the sunlight is strong, shade should be provided immediately; if it rains more, drainage should be provided in time; in case of cold weather, trellis can be built to keep warm, etc.

Grafting as a common means of Magnolia breeding, the requirements are more strict, it is best to arrange in the spring in March and April, the grafting methods are: bud grafting, without terminal bud cutting, with terminal bud cutting, the experiment proved that, with terminal bud cutting grafting effect

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is the best . As for the selection of grafting rootstock, you can choose the same genus with magnolia, the grafting effect will be better, and the survival rate will be higher.

2.2 Management

2.2.1 Spring management

Spring management of magnolia begins with watering and fertilizing. As spring gradually warms up, magnolias tend to lose moisture, so it's important to keep them hydrated. Although early spring fertilization is beneficial to magnolia root growth, newly transplanted plants should especially be moderately fertilized. The pruning of magnolia can be chosen in the spring, when the climate is favorable for branch recovery. Magnolia pruning is not easy to too much, mainly to cut off the branches, branches and leaves that do not grow well or grow too fast, and promote the sprouting and growth of new branches, branches and leaves. Magnolias also have to cope with spraying for insects and diseases in the spring.

2.2.2 Summer management

Summer temperatures are high, in addition to shade, but also to maintain a reasonable level of humidity. At this time the magnolia is prone to water shortage, watering time is best chosen in the morning, so that it can be better absorbed in. Lastly, magnolia is a fleshy root, care must avoid stagnant water after summer rainstorms.

2.2.3 Autumn and winter management

Magnolia should especially be whitewashed in autumn and winter, both to prevent frostbite and to control and kill insects. Attention should also be paid to regularly clearing fallen leaves and weeds from the planting site to reduce insect and pathogen . Magnolia can not be over-pruned, in the winter pruning is only to remove diseased branches, residual branches, which not only reduces the disease, increases light penetration, but also improves the cold resistance.

3. The application of magnolia in landscape design analysis

With the development of the economy and the deepening of the urban process, the construction of landscaping has developed by leaps and bounds. The application of plants in landscape design contributes to the harmonious coexistence of man, nature and environment. Magnolia, as a plant with high ornamental value and greening value, has been chosen more and more frequently, in form and scope in the landscape.

3.1 Principles of Magnolia in Landscape Applications

3.1.1 Principle of ecological matching

In the application of landscape gardening, it must conform to the ecological reasonable configuration[1] and pay attention to the principle of diversity between magnolia and other plants. First of all, it should be analysed according to the ecological characteristics of the natural growth of magnolia, but also grasp the degree of match and fit between magnolia and other plants, etc.: such as planting environment (soil, sunlight, humidity, temperature, etc.), planting height, planting density, planting range, planting colour and other data. Magnolia can be planted with osmanthus flowers, cherry , red maple, bamboo, peach blossom, plum blossom, ginkgo, camellia, pine and other plants, and the plants can be planted in groups, and the plants and plants can be arranged in high and low configurations, intertwined with trees and shrubs, paired with deciduous evergreen, and distributed in primary and secondary plants, etc., so as to create the design of species-rich, staggered and diversified symbiotic landscape groups, and to meet the high quality demand of modern human life.

3.1.2 Seasonal matching principle

Landscape design should consider the different seasons of spring, summer, autumn and winter, and the growth pattern and changes between landscape plants in the four seasons with combinations. Magnolia flowers bloom in spring, magnolia fruit ripens in autumn, and magnolia itself is an evergreen plant. The four-season matching rules of magnolia include: “spring and summer” flower and leaf, flower and flower, fragrant and non-fragrant matching; autumn flower and fruit, deciduous and non-deciduous, deciduous and non-deciduous fruit (dynamic and static) matching; In winter, the matching of “green and withered, high and low” ....., in short, let the landscape design show the harmonious effect of changing

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scenery throughout the year.

For example, magnolia can be paired with peach blossom, cherry and other early spring trees in the spring, to feel the flowers in spring. In summer, it can be paired with pomegranate and other plants to feel the elegant summer scenery; in autumn, it can be paired with ginkgo, red maple, osmanthus flowers and other plants to feel the colourful autumn scenery; in winter, it can be paired with pine and bamboo plants to feel the staggered winter scenery. It realises the diversification of plant matching, hierarchical structure and ecological scenery in all seasons.

3.1.3 Colour integration principle

Magnolia flower colour is white, fruit is red and leaves are green. In the overall integration of landscape colour, the use of reasonable configuration of colour. Such as magnolia trees and shrubs in this combination of colour integration, need to use brightly coloured flowers or leaves configuration; such as magnolia leaves throughout the year show green, can be paired with colourful foliage plants to accentuate, create a sense of hierarchy in the landscape. Such as magnolia's flower colour is white, white is colourless, so can be matched with flowering plant colour selectivity is larger, the range is also wider. Magnolia and plant colour reasonable configuration, let the landscape show colourful beautiful scenery.

3.1.4 The principle of local choice

In landscaping, preference is generally given to plant species that are suitable for native growth and cultivation, and magnolia's

The growing area is in the south basin of Yangtze River, which is more conducive to the planting, transplanting and breeding of magnolia, and building a more stable, feasible and economical ecological landscape, together with the humanities, history, customs, etc., which also better reflect the spiritual and cultural value of magnolia. Again, the large selection of magnolia locally also saves a lot of manpower, material and financial resources, which is conducive to the optimal use of local land resources as well as the co-construction of frugal landscapes.

3.2 Specific applications of magnolias in the landscape

In the garden landscape design, like magnolia this has a certain degree of cold resistance, resistance to wind and dust, anti-pollution, less pests and diseases, high medicinal value, and contains noble, pure, fragrant temperament, set of foliage, flowers, fruits as one of the evergreen trees, in the garden greening is widely respected, is used in road greening (as street trees); community, campus greening; square, public green space greening; parks and other environmental greening.

3.2.1 Application of Magnolia planting

3.2.1.1 Independent planting

Magnolia independent planting: it can be planted as the centre, alone; it can be planted symmetrically according to a certain axis; it can also be planted in horizontal or vertical columns according to a certain distance; it can also be planted in groups according to a certain number of people.

3.2.1.2 Matching plants

In addition to independent planting, magnolia can also be planted with other plants. In the magnolia with the choice of planting, to give full consideration to the characteristics of magnolia itself, but also to grasp its relationship with another one or more kinds of plants with the overall coordination of plants, to ensure that magnolia and all the configurations of plants can be better and faster complementary, reflecting the growth, to achieve a harmonious and unified effect of planting.

3.2.2 Application range of Magnolia

3.2.2.1 Greening of roads

Magnolia tree posture upright, elegant, evergreen, white flowers, leaves, not only can beautify the streetscape, but also purify the air, but also shade, is a very good variety of road greening. In roadway landscaping, choose magnolia in the form of larger, not too small. If you choose a smaller magnolia, easy to scratch the road pedestrians, vehicles, but also will make its own easy to break.Magnolia in the roadway greening, but also often with colourful foliage plants, more highlight the richness of the streetscape and changes.

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3.2.2.2 Greening of neighbourhoods and campuses

Magnolia is also often cited in communities, campuses and other greening, relying on the magnolia plant's own colour, shape, smell characteristics, rendering the best landscape atmosphere, to create a comfortable, pleasant, ecological environmental experience. Generally, the colour of the buildings in the district and campus is dark or darker, while the flowers, fruits and leaves of magnolia show white, red and green respectively, which reflect and complement each other with the colours of the buildings in the district and campus as well as the surrounding landscapes; magnolia is not the same as other greenery, and is not easy to be over-pruned, so it shows the form of natural beauty, and it can soften the natural beauty of the plants and the artificial beauty of the buildings perfectly and show the artistic structure and line beauty of the buildings; magnolia can also be used in the greening of the district and campus. In neighborhoods or campuses, magnolia is mostly planted in flower beds, lawns or pathways. Magnolia's pure flowers and light fragrance make people and the environment blend harmoniously and in an orderly manner.

3.2.2.3 Greening of squares and public green spaces

Magnolia is mainly used to satisfy people's ornamental and experiential needs in the greening of squares and public green areas, such as access points, main and secondary roads, paths, lawns, and so on. Magnolia can be planted singly, doubly or in groups in access points, main and secondary roads, paths and other environments. It can also be arranged in the open lawn, large area of small slopes and so on, such as magnolia as the centre, and other trees, shrubs, lawns and so on from high to low, aligned, and embellished with planting of slightly higher pine trees and so on, constituting an aesthetic sense, a strong sense of hierarchy of the plaza, the ecological planting of the public green space landscape group.

3.2.2.4 Greening of parks

Magnolia not only can be planted with plants, but also with water bodies, rocks, architectural vignettes and other elements of planting, to play the landscape in the orchid, orchid in the landscape of the view, showing the characteristics of the garden landscape and cultural sentiment.

Water is the flowing soul in the landscape, and the size of the water body determines the size of magnolia to choose and how much to plant. Such as planting magnolia on the shore of the water body, island area in the water, can add a sense of space in the water landscape; also can be plants, water, shadow fusion together, depicting different picture sense; at the same time, flowers, leaves fall on the water, and formed another dynamic beauty; magnolia and water-side plant combinations, the formation of a sparse and dense, straight and curved, near and far the wonderful scenery.

In landscape design, magnolia can integrate the space of plants and buildings, vividly and flexibly. Architectural vignettes such as pavilions, etc., in the integration, the need for magnolia and the shape of the building, colour, height, stature, choose the corresponding plant body, the soft lines of plants rendering the hard structure of the building, reflecting the unity of harmony, unity of the richness of the sense of contrast. At the same time, the doors, windows, columns and frames of the buildings with magnolia also form the landscape in the frame, leakage landscape and permeable landscape, which is a vivid interpretation of “garden aesthetics”[2] . Reasonable magnolia planting can also improve some functions of architectural vignettes, such as shade and coolness, wind and dust removal.

Magnolia can break the monotony of the listing of mountains and rocks when it is configured with mountains and rocks; the words and poems engraved on some of the mountains and rocks can also increase the temperament quality of magnolia. Magnolia and mountain, stone ensemble, not only reflects the magnolia body, temperament beauty, but also highlights the unique texture of the stone and cultural atmosphere, the two united, complement each other.

3.2.3 Magnolia application results

3.2.3.1 Protection of the environment

In landscape application, magnolia has certain wind resistance due to its developed root system, fewer pests and diseases, which can resist bad weather and fully protect the surrounding environment. At the same time, magnolia has the ability of anti-dust and anti-pollution, which can adsorb a certain amount of dust, dust and harmful gases (such as sulphur dioxide, chloride, hydrogen fluoride, etc.) , purify the air and improve the quality of the environment. The organic substances emitted by magnolia itself can also kill harmful bacteria and microorganisms, providing people with a clean ecological living environment.

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3.2.3.2 Landscaping

Magnolia is evergreen in all seasons, with upright trunk, full tree shape, thick and bright leaves, and beautiful lotus-like flowers, which is a tree integrating ornamental and application value. Magnolia can be planted independently or with other plants, and can also be combined with water bodies, architectural sketches, rocks and other combinations, applied in landscape greening to beautify the environment.

3.2.3.3 Medicinal value

The whole body of Magnolia has high medicinal functions. Magnolia bark, flowers, leaves and fruits can benefit the lungs, eliminate phlegm, lower blood pressure, antibacterial, eliminate fatigue, etc., and can also treat headache and runny nose, vomiting and diarrhoea, and wind-cold, etc., and note that its flower buds should be dried and ground before being used as medicine; Magnolia flowers can be used to make tea, and its flowers and fruits can be used to refine the essential oils, which have the effect of beauty care and slowing down the aging process.

3.2.3.4 Local characteristics

Magnolia grows in the south of the Yangtze River Basin, and has been chosen as the “city tree” of many cities, with a long history of planting, as well as geographic and historical humanistic and cultural values. The poems, songs, calligraphies, architectural works and artworks related to magnolia are integrated with local gardens and landscapes, highlighting the unique charm of the place.

3.3 Evaluation system of Magnolia's application effect in landscape

According to the above cultivation of magnolia and its application in landscape design, detailed description, comprehensive analysis unfolded, and along the principles of science, objectivity, practicality, aesthetics, etc., the indicators of each level in the system were selected, and finally, the evaluation system of the application effect of magnolia in the landscape was established . The overall system here should not only encompass the propagation and cultivation of magnolia itself, but also show the morphology, colour and style of magnolia as well as its harmony and unity with the ecological environment, and finally convey the application value of magnolia, etc. In short, the overall creation of magnolia evaluation system can better enable magnolia to be applied in landscape greening, and then create a more ecological, low-carbon, sustainable landscape space.

First-level indicator layer: A (evaluation effect of magnolia application in landscape) = A1, A2, A3, A1 is magnolia planting and cultivation indicator, A2 is magnolia landscape design indicator; A3 is magnolia application harvesting indicator.

Secondary indicator level: A1 (Magnolia planting and cultivation indicator) = a1, a2, a1 is magnolia propagation status, a2 is magnolia management status.

A2 (Magnolia landscape design indicator) = a3, a4, a5, a3 is Magnolia application principles, a4 is Magnolia application planting, and a5 is Magnolia Application Scope.

A3 (Magnolia application yield indicator) = a6, a7, a8, a6 is Magnolia economic harvest, a7 is Magnolia social harvesting, a8 is Magnolia Cultural Harvest.

The weighting scores of each tier should be derived based on surveys, analyses and collations determined by garden professionals (e.g. Landscape design specialist, teachers, frontline workers,etc.) (the survey platform can be obtained by choosing advanced survey APP or applets).

At the same time, the final evaluation results were determined objectively and scientifically. The evaluation of the application effect of magnolia in the landscape is divided into five levels as very good (≥9), good (9＞A≥7), general (7＞A≥5), poor (5＞A≥3), and very poor (A＜3), and the following is an example of a score out of 10 (as shown in table 1).

Table 1 Comparison of effect scores of magnolia application in landscape

(A)Scores	≥9	9＞A≥7	7＞A≥5	5＞A≥3	A＜3
Evaluating The Effects	very good	good	general	poor	very poor

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4. Conclusion

With the comprehensive development of social economy and the increasing improvement of people's quality of life, the beautification and sustainable development of the environment have been paid attention to gradually, and are facing the direction of diversification[3] , ecology and speciality[4] . The propagation and cultivation of magnolia should be managed strictly and scientifically according to the characteristics of the plant itself and the local natural environment. Magnolia has a wide range of garden applications: it can be used in road greening; community and campus greening; square and public greening; park greening and other scopes. Magnolia is evergreen in all seasons, erect and colorful, with large flowers and red fruits, and fragrant. Magnolia not only beautifies the living environment, but also resists wind and dust, pollution and purifies the surrounding air.magnolia is also a treasure, has a high medicinal value and economic value; at the same time, magnolia shows the local characteristics and cultural temperament, and therefore has been elected by a number of cities as the“City Tree”. At the same time, magnolia also shows local characteristics and cultural temperament, so it is elected as“city tree” by many cities, with great ornamental value and greening value, and it is one of the important varieties of landscaping and greening. The“Magnolia Application Effect Evaluation System in Landscape” built on the basis of the above can better enable Magnolia to be applied in landscape greening, and then create a more ecological, low-carbon and sustainable landscape space.

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References

[1] Yin Zhipeng(2019),Discussion on Ecological Landscape Design and Plant Configuration[J], Contemporary Horticulture,(22),p81-82.
[2] Peng Yuanfang (2022),The Application of Chinese Classical Garden Aesthetics in Modern Design--The New Museum of Suzhou as an Example[J],Urban Architecture Space,03),P118-120.
[3] MA Yifang(2022),Research on the design of urban square landscape diversity and ecological diversity ——Take the design of the central square of the city in Fuzhou High - tech Zone as an exampl[J], Fujian Architecture & Construction,(11),p17-20.
[4] Wang Qian(2023),An Exploration of Regionally Distinctive Landscape Reconstruction from a Humanistic Perspective[J],Foshan Ceramics,(06),p152-155,170.