

Countermeasures for Improving the Quality of Environmental Design Through Zanthoxylum Bungeanum Planting and Cutting

Wanyi Zhao¹, Jinpeng Wang², Caiyun Gan³, Jieyang Pei²

¹Anhui University of Finance and Economics, Bengbu 233000, Anhui, China

²Liming Vocational University, Quanzhou 362000, Fujian, China

³Quanzhou Open University, Quanzhou 362000, Fujian, China

Abstract

Zanthoxylum bungeanum is a plant with strong ornamental value, economic benefits and medicinal value. It will be affected by many factors in the process of planting, including soil, climate, terrain and management level. In China, the planting area of Zanthoxylum bungeanum is also increasing, but there are still many problems, such as single variety, extensive planting management, serious pest damage and so on. Based on this, this paper discusses the Countermeasures of the combination of Zanthoxylum bungeanum planting and cutting and environmental design, aiming to provide reference for the sustainable development of Zanthoxylum bungeanum industry in China and promote the healthy development of Zanthoxylum bungeanum industry.

Keywords

Zanthoxylum Bungeanum; Planting and Cutting; Environmental Design.

1. Introduction

The purpose of environmental design is to make space and nature harmonious and unified, and make the environment more comfortable and beautiful. From the designer's point of view, design is a circular process. In the process of interaction with nature, designers should combine various elements in nature with space, and form a new space form through the interaction between man and nature. The designer's understanding of the natural environment determines whether the design work can fully reflect its value. If we want to integrate nature into design, we must be good at grasping and utilizing the environment. Take Zanthoxylum bungeanum as an example. Zanthoxylum bungeanum has a long history of planting in China and is one of the most representative tree species in the hearts of the Chinese people. Zanthoxylum bungeanum is known as "China Red" and has certain ornamental and economic value. In addition, Zanthoxylum bungeanum can not only afforest the environment, but also create a good cultural atmosphere. Therefore, the introduction of Zanthoxylum bungeanum into the field of design has a great impact on the quality of environmental design.

2. Growth Environment

Zanthoxylum bungeanum is a light loving crop with warm climate, developed root system and lax requirements for soil. Generally, neutral or slightly acidic soils can be planted, and sandy loam with deep soil layer, loose soil and high organic matter content is the most suitable. Zanthoxylum bungeanum has strong drought resistance and can grow in areas with annual precipitation of more than 500 mm. However, in areas with arid climate or high altitude, Zanthoxylum bungeanum is prone to drought, such as small leaves, light color, less flowers, and even unable to blossom or poor flowering quality. Zanthoxylum bungeanum has strong adaptability to soil, and sandy loam with good drainage is generally suitable. Zanthoxylum

bungeanum likes sandy loam with deep soil layer, loose fertility and good drainage. The most suitable soil pH value is 5.5~6.5. *Zanthoxylum bungeanum* has strong adaptability and low temperature requirements. It can be cultivated in areas with annual average temperature above 18 °C, but it grows best in areas with annual average temperature of 15~18 °C and extreme low temperature above -6 °C [1].

3. Planting Season

The planting season of *Zanthoxylum bungeanum* is determined by tree species. Different kinds of *Zanthoxylum bungeanum* are suitable for different planting seasons. In northern China, it can be sown in autumn, but not in spring. Spring is the growing season. Plants germinate, blossom, bear fruit, fall leaves and dormant. After planting in spring, plants can adapt to the changes of the external environment in time and improve their survival rate. From autumn to spring and then to autumn, the weather gradually becomes cold, the temperature gradually decreases, and the temperature difference between day and night gradually increases. At this time, the temperature is relatively low, the plant growth is slow, the root is shallow, and the soil moisture content is relatively low. If it is planted too late, plant roots and soil moisture will not meet the normal growth needs of plants. Therefore, planting in winter should be done as early as possible. Watering should be done in time after planting to ensure the survival rate. In order to ensure the normal growth of plants, attention should be paid to timely weeding and topdressing in the process of planting. Fertilizers are mainly organic and compound fertilizers. Compound fertilizer is mainly used at seedling stage. At the seedling stage, urea, ammonium sulfate and other fertilizers can be applied. In the seedling stage, if the fertilizer is insufficient, the plant will grow slowly and cannot grow fully, leading to plant death. Therefore, compound fertilizer should be applied in time. For the later growth of plants, nitrogen and phosphorus fertilizers are mainly used. Fertilizer should be applied in autumn. In order to promote the growth and development of plants, it is best to apply organic fertilizer in summer. *Zanthoxylum bungeanum* is a kind of tree species with high environmental requirements. Usually, they can survive the winter safely after planting in northern areas. If the climate is good, it can grow normally and blossom and bear fruit; If the climate is poor, it may not grow and blossom normally. When planting *Zanthoxylum bungeanum* in arid areas, attention should be paid to timely irrigation and fertilization to promote the growth of plants. In the southern region, the growth conditions are relatively good, and it can survive the winter safely after planting. If the climate is good, it can grow normally and blossom and bear fruit. *Zanthoxylum bungeanum* likes sunshine and should be planted in sunny places. Generally, it is suitable for growing in fertile, loose and well drained soil [2].

4. Planting Method

There are many planting methods of *Zanthoxylum bungeanum*, the most common are pot planting and hole planting. Pot planting is suitable for family planting, and hole planting is suitable for enterprise planting. In addition, there is a relatively simple method to plant it directly in the pot in early spring or winter. The main difference between the two methods is sowing and seedling raising. Hole planting can be selected for seedling cultivation because it is more convenient and simple than pot planting, but it should be noted that if the seedlings grow poorly, they should be moved to the pot and transplanted. Seedlings should be kept clean, moist and sunny before transplantation. Usually, when the seedlings grow new buds, they can be moved to the pot. When the seedlings grow new buds, they should be watered immediately and placed in a sunny place to promote the growth of seedlings. When the seedling grows to about one meter, it should gradually expand. At this time, it should be a dry, sunny and well ventilated environment. If the temperature is too high, ventilation and temperature reduction are

required. When the height of seedlings exceeds 15 cm, the flowerpots can be removed and properly trimmed to create a good environment for future growth. During seedling raising, proper fertilization and irrigation are needed to promote its growth and increase its yield. At seedling stage, we should control the frequency of watering and fertilization. Usually, topdressing is carried out every two weeks, that is, the second fertilization is carried out about a month after the first fertilization. When the seedlings grow to about 1 meter, the flowerpots can be removed. When the seedlings grow to about 3 meters, it can remove the flowerpot to provide more space and ventilation for them. If Topdressing and irrigation are not carried out during this period, there will be a large number of buds and flowers in the next spring or summer.

5. Seedling Selection

(1) Seedling specification: ① the diameter of the main stem is greater than 0.7 cm, and the number of branches above 1 m is more than 3; ② The trunk height is 1.5-2.0m, and there are 2-3 side branches; ③ The annual branches are more than 40 cm long, the biennial branches are 20-30 cm long, and the triennial branches are 10-20 cm long. ④ False seedlings shall be free from diseases and pests.

(2) Planting methods: ① when planting large seedlings, large holes must be dug and enough base fertilizer must be applied; ② When the seedlings are planted, they must carry soil lumps or nutrient pots; ③ Water the big seedlings after planting. When planting seedlings, keep the root soil moist; ④ After the seedlings are planted, the roots should be sealed with fine soil in time.

(3) Seedling management: ① after the seedlings are unearthed, wipe off the leaves in time to prevent the evaporation of water from the leaves. ② The seedlings excavated from the planting ground shall be planted at the same time, and labels shall be inserted in time to prevent air drying. ③ Water the big seedlings in time after planting.

6. Planting Density

Zanthoxylum bungeanum is a plant with strong adaptability. In different places, it can grow in different environmental conditions. From seedlings to adults, trees can adapt to the arid, cold, barren and barren soil environment. The planting density of *Zanthoxylum bungeanum* is generally related to varieties, such as Dahongpao, Dahongpao, etc. In addition, altitude will also affect the growth of *Zanthoxylum bungeanum*. First, the higher the altitude, the poorer the soil and the greater the planting density. In addition, planting density is also related to planting varieties. Secondly, the maximum density of planting varieties is determined according to the characteristics of varieties. For example, the planting density of small leaf pepper is small; Large leaf pepper with large planting density; *Zanthoxylum bungeanum* has different varieties and needs different management measures. Finally, in plain and hilly areas, the plant row spacing is generally 4 meters × 5m or 6M × 5 meters; In mountainous and plateau areas, the plant row spacing can be appropriately expanded to 3-4 meters × 5-6 m [3].

7. Environmental Design

There are many countermeasures for the combination of *Zanthoxylum bungeanum* planting and cutting and environmental design, but the environmental design is mainly from the perspective of *Zanthoxylum bungeanum* planting and cutting. The purpose is to combine *Zanthoxylum bungeanum* planting and cutting with environmental design, so as to improve the quality and yield of *Zanthoxylum bungeanum*. Therefore, in the process of *Zanthoxylum bungeanum* planting and cutting, we should start from the perspective of environmental design

as far as possible, with the main purpose of improving the quality and yield of *Zanthoxylum bungeanum*. For example, when designing the environment, we should pay attention to the following points: first, select the appropriate growth area, and second, select the appropriate geographical location. Third, we should pay attention to the different suitable growth areas of different varieties. Fourth, we should pay attention to the planting environment in different regions and different climatic conditions. Sixth, we should pay attention to the relationship between the planting and cutting of *Zanthoxylum bungeanum* and the natural environment. Seventh, we should pay attention to the influence of temperature in different seasons on the growth of *Zanthoxylum bungeanum*. In addition, in the environmental design, the following points should also be paid attention to: first, pay attention to the impact of different regional climate conditions on pepper planting, such as light intensity, temperature, humidity, etc. under different regional climate conditions. Second, we should pay attention to the influence of temperature in different seasons on the growth of *Zanthoxylum bungeanum*, such as the influence of temperature change in spring and high temperature in summer on the growth of *Zanthoxylum bungeanum*. Third, we should pay attention to the impact of soil quality in different regions on the cultivation of *Zanthoxylum bungeanum*, such as acid soil and alkaline soil. Different soil quality has different effects on the cultivation of *Zanthoxylum bungeanum*, such as sandy soil is favorable for the growth of *Zanthoxylum bungeanum*, while clay is unfavorable for the growth of *Zanthoxylum bungeanum*. Fourth, we should pay attention to the impact of pests and diseases in different regions on pepper planting, such as root rot, black spot, red spider, etc. Fifth, we should pay attention to the impact of different climatic conditions on the cultivation of *Zanthoxylum bungeanum*, such as the impact of drought on the growth of *Zanthoxylum bungeanum*, and the impact of low temperature on the growth of *Zanthoxylum bungeanum*. Sixth, we should pay attention to the impact of soil physical and chemical properties on the growth of *Zanthoxylum bungeanum* in different regions, such as soil organic matter content, soil pH value, etc.

8. Trimming Method

(1) Thinning branches: the branches are cut from the base, while the remaining branches are generally left in the original position. Pruning methods should be different from tree to tree, because the purpose of tree pruning is to improve yield, quality and achieve high yield and quality. Therefore, the pruning method should be determined according to different varieties and tree ages. Generally, the varieties with early fruiting, small plant age and tall crown should be retracted and slowly released; Results the varieties with late age, large plant age and low crown should be short cut; For young trees, the method of thinning branches should be adopted to make them more branches and bear fruit earlier; For aging trees, we should try our best to maintain the vitality and vigor of the plants to restore their fruiting ability.

(2) Shaping and pruning: the purpose of shaping and pruning is to cultivate the tree vigor to achieve balance, ventilation and light transmission, reasonable crown structure, even distribution of branches, and coordination of proportion among main branches, side branches and fruiting branches. At the same time, maintain the vigorous growth of the tree, and continuously expand the crown to achieve the purpose of high yield, stable yield and high quality. Reshaping and trimming generally include reshaping and trimming. Pruning is to prune trees according to their growth potential, variety characteristics and requirements for fruit, and cultivate trees that meet the requirements. Pruning is to trim the tree according to its growth potential and results [4].

(3) Flower and fruit management: flower and fruit management is to take different measures and methods to promote flower ear differentiation and flowering and fruiting according to the different fertilizer requirements of fruit trees in the whole growth process of fruit trees. If the

fruit setting rate is low due to insufficient fertilization or poor soil conditions during flower ear differentiation, flower thinning can be carried out. The principle of flower thinning is to eliminate the weak and retain the strong, and to retain more and less. The flower thinning methods include single leaf method, leaf bottle method and bud cutting method. Single leaf method: at the full flowering stage, all inflorescences were cut off from the base, 1-2 leaf buds were retained, and the rest were all removed, and the hormone solution such as Paclobutrazol was sprayed once. ② Leaf bottle method: spray on the leaves at the full bloom stage for 2-3 times continuously. ③ Bud cutting: before the fruit trees bloom. Cutting buds can promote short branch varieties to bear fruit earlier, and long branch varieties to stop growing earlier. ④ Flower thinning: during the period from full bloom to 20 days after full bloom, a robust and normally developed flower shall be selected from the flower spike, and the rest shall be removed. ⑤ Bagging: start bagging 7 days after flower withering.

9. Conclusion

The combination of planting and cutting of *Zanthoxylum bungeanum* and environmental design can not only improve the yield of *Zanthoxylum bungeanum*, but also improve the quality of *Zanthoxylum bungeanum*. The significance of the combination of *Zanthoxylum bungeanum* planting and cutting and environmental design is to let more people know and love *Zanthoxylum bungeanum*, and then let more people invest in planting, processing and sales, so as to realize the sustainable and healthy development of *Zanthoxylum bungeanum* industry. Through scientific planting and reasonable cutting, the ecological benefits, economic benefits and social benefits will be unified to improve the land utilization rate. Scientific planting and reasonable cutting can not only improve the efficiency of agricultural production, but also reduce environmental pollution, so that people can have a better ecological environment in production and life. While developing the economy, we should not forget to protect the environment, let people feel the beauty and vitality of nature, and realize the win-win of ecological and economic benefits.

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