

# Brief Analysis on the Application of "Four Modernizations" Plants in the Reconstruction of Green Space in Yangpu District

Guangqiang Zhai<sup>1,\*</sup>

<sup>1</sup> Shanghai Yangpu Urban Construction Investment (Group) Co., Ltd.

\*Corresponding author. Email: 18321252571@163.com

## ABSTRACT

Through the research method of combining theory with practice, this paper first summarizes the concepts related to "four modernizations" plants, and explains the introduction and characteristics of four modern plants; The degree of application in the 6 public green space projects further describes the characteristics and application effects of commonly used colored trees and shrubs. Then it expounds the problems encountered in the process of planting and maintenance of "four modernizations" plants, and proposes a reasonable solution through literature retrieval and analysis and research methods of current conditions. Finally, the summary and prospect of the application of "four modernizations" plants in Yangpu District will provide a reference for continuing efforts to improve the level of fine management of greening and the construction of ecological environment quality in Yangpu District.

**Keywords:** Colored plants, renovation of public green space, beautiful neighborhoods, road green space.

## 1. INTRODUCTION AND CHARACTERISTICS OF FOUR MODERNIZATION PLANTS

Since the 18th National Congress of the Communist Party of China, General Secretary Xi Jinping put forward the conclusion that "lucid waters and lush mountains are invaluable assets", and Shanghai has further put forward the requirements of "greening, coloring, preciousness, and efficiency" (referred to as "four modernizations") for greening. In 2018, Shanghai issued the "Guiding Opinions on Implementing the "Four Modernizations" to Improve the City's Greening Quality, requiring the "beautiful neighborhoods" as the starting point to coordinate the promotion of the "four modernizations" construction, comprehensively improve the level of greening technology and maintenance, and allow the blocks, the road greening effect and the service to the public are further promoted.<sup>[1]</sup> Greening is an inevitable requirement and an important foundation, and is the core of ecological civilization construction, which is mainly reflected in ecological, environmental and landscape functions. Colored plants are the features and highlights of the "Four Modernizations", including flowers, leaves, fruits, and dried plants. Colorful plants are lively and vivid. If they are combined with the

surrounding rigid and monotonous buildings, the environment will be more colorful and colorful. Be flexible. Precious seedling varieties generally include seedling varieties with robust growth, rare, long growth cycle and beautiful shape, mainly including the protection of ancient and famous trees and the introduction and cultivation of precious seedlings. Efficiency mainly includes ecological, social and economic benefits, and it is characterized by sustainable development.<sup>[2]</sup>

## 2. COLORED PLANTS COMMONLY USED IN THE RECONSTRUCTION OF GREEN SPACES IN YANGPU DISTRICT

### 2.1. The application of four chemical plants in the transformation of green space in recent years

Through the actual project participation and related project survey and investigation, the current situation of the reconstruction of green space construction in Yangpu District is obtained. The green space reconstruction projects involved in this article are Zhoujiazui Road (Dalian Road-Jungong Road), Longchang Road (Zhoujiazui Road-Xiang Yin Road), Songhuajiang Road

(Shuangyang Road-Jungong Road), Huangxing Road (Guoding East Road) - Zhongshan North 2nd Road), Dalian Road (Siping Road - East of Yangshupu Road) road reconstruction green space and 138 blocks of public green space (the following project names use

abbreviations). "Four modernizations" plants have an application rate of 100% in the 6 plots of green space renovation projects, and the area and varieties of trees and shrubs are relatively rich (Table 1)

**Table 1.** 6 plots of green space renovation project situation table

Name	Type of green space	Location	Area (m <sup>2</sup> )	Variety of trees and shrubs
Yingkou Road	City appearance and environment improvement	Zhoujiazui Road-Xiangyin Road	10944.5	56
Zhaoujiazui Road	City appearance and environment improvement	Dalian Road-Military Industry Road	18590	32
Songhuajiang Road	City appearance and environment improvement	Shuangyang Road-Military Industry Road	8326.5	32
Huangxing Road	City appearance and environment improvement	Guoding East Road-Zhongshan North 2nd Road	3972.3	37
Dalian Road	City appearance and environment improvement	Siping Road-East side of Yangshupu Road	7642.4	64
138 Neighborhood	New public green space	Zhoujiazui Road Longchang Road southeast side	4787	15

All the data in this paper are through the "Four Chemical" Wooden Plants List in Shanghai (First Batch) (No.88,2019), "Four Chemical" woody Plant Application Manual ", " The First Batch of Key Application and Second Batch of Recommended List of "Four Chemical" Woody Plants in Shanghai " and China Botany Network (<http://www.iplant.cn>), A long retrieval and viewing period, With the seasonal changes, the flowers, leaves and fruits of plants show gorgeous colors and different morphological changes, Or the branches and leaves are different from conventional plants, Including flower-viewing plants; Color leaf plants (including autumn leaf plants, spring leaf plants and common leaf plants); <sup>[3]</sup>fruit-watching plants; Dried plants, Through the retrieval analysis as described above, And the project site survey and research comparison and analysis is obtained. The distinctive and applied varieties are giant Bauhinia and diamond embroidered chrysanthemum in the isolation belt of Huangxing Road, accounting for 55% of trees and shrubs; Begonia, crabapple and crape myrtle on Longchang Road in 58.5%; clover, magnolia and plum in 55.6%, and 53.8% in 138 neighborhoods and 53.7%.After the application of colorful plants, the landscape characteristics of "One Road One Product" in the beautiful block are presented,

and the surrounding environment has been greatly improved and improved. According to the actual investigation and survey of the green space reconstruction project of the 6 plots, the proportion of colored plants in parks and various green areas is calculated as follows:<sup>[4]</sup>

(1) Proportion of colored trees = number of colored trees/total number of trees × 100%

(2) Proportion of colored shrubs = area of colored shrubs/total shrub area × 100%

(3) The proportion of colored plants = (the proportion of colored trees + the proportion of colored shrubs)/2.

It is concluded that the average application proportion of colored plants in the green space renovation projects of the 6 plots is 61.6%, and the average proportion of colored plants is 81.9% (Figure 1), which exceeds the "Four Modernizations" Planning Outline of Shanghai Parks and Green Spaces 2018 Requirements for more than 70% colored plants in new parks and green spaces. Overall, the number of applications of colored plants in these 6 renovated green spaces is generally good.

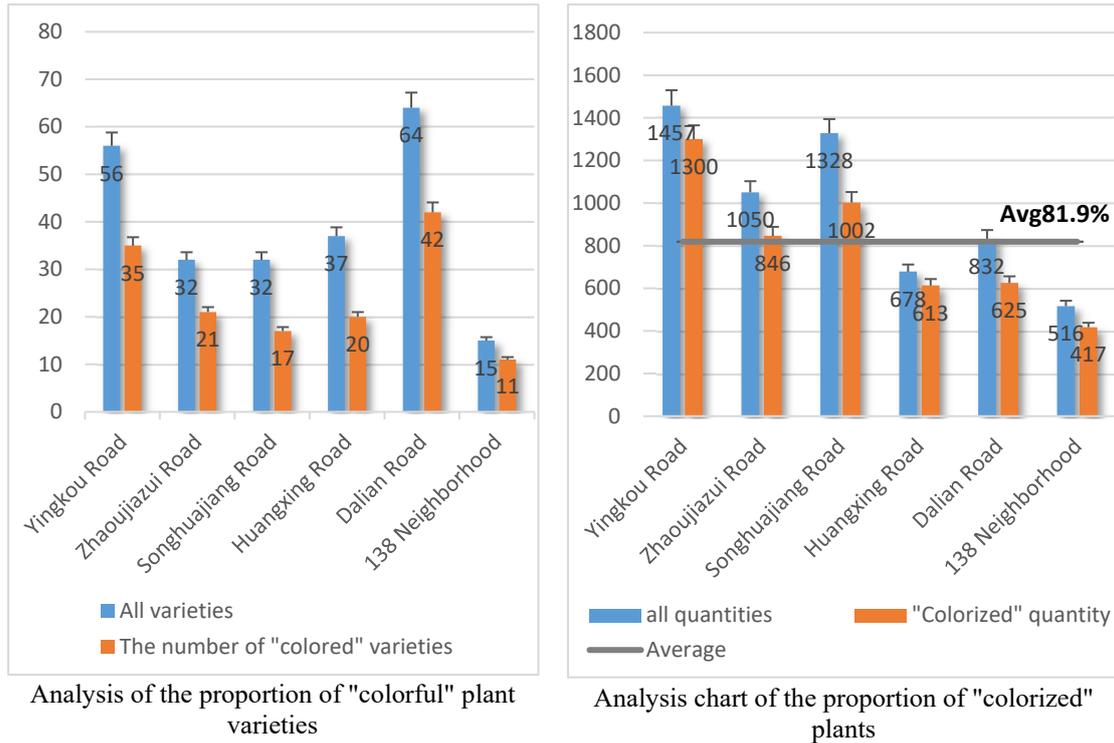


Figure 1 Analysis of "colorful" plants in the green space renovation project of the 6 plots

2.2. Analysis of commonly used varieties of colored plants

In this paper selected yangpu district in recent years, new 6 pieces of green space samples, a total of 136 kinds of tree plant varieties, through the Shanghai "four" woody plant list (the first batch) (Shanghai green, 88) file recommended plant varieties and Chinese flora,

retrieval and analysis of the 6 pieces of green space color plants in about 89 plants, accounting for about 65.44%. Among them, the most commonly used varieties are bright golden virgin, red maple, small wax, safflower wood and crape myrtle, and the utilization rate is 100% among the 6 green areas, and the application rate of heather, hibiscus and eight immortals is 83.33% (see Table 2).

Table 2. Number and use of colored plants in green space of plot 6

Plant name	Color characteristics and seasonal performance	Quantity (plant)	Distribution
<i>hall crabapple flower</i>	Falling leaves / flower viewing, fruit / spring flowers, autumn fruit	609	Yingkou Road Longchang Road
<i>Hibiscus syriacus L</i>	Leaves / flower viewing / summer flowers	486	Songhua River Road, Zhoujiazui Road
<i>Beauty plum</i>	Falling leaves / flower viewing / spring flowers	401	Songhua River Road, Zhoujiazui Road
<i>Michelia alba</i>	Falling leaves / flower viewing / spring flowers	292	Dalian Road, Zhoujiazui Road
<i>Diamond leaf embroidery line chrysanthemum</i>	Leaves / flower viewing / summer flowers	287	Huangxing Road, Dalian Road
<i>North American begonia</i>	Falling leaves / flower viewing, fruit / spring flowers, autumn fruit	240	138 Neighborhood
<i>fragrans</i>	Evergreen / flower viewing, leaf / normal color leaves	229	138 Neighborhood, Songhua River Road, Yingkou Road



		and autumn flowers		
The genus	<i>'Vine rainbow</i>	Evergreen / flower	246	Songhua River Road,
Rosaceae	<i>" Chinese rose</i>	viewing / spring, summer		Dalian Road, Huangxing
		and autumn flowers		Road

### 3. ANALYSIS OF THE CONSTRUCTION EFFECT OF COLORED PLANTS

#### 3.1. Beautiful Block, Yingkou Road

Yingkou Road (Yanji East Road-Songhua River Road) machine non-isolation belt planted 173 crape myrtle with a diameter of 7-8 cm, which is the same as the original crape myrtle on Longchang Road of Yingkou Road (Jiamusi Road-Xiangyin Road), and the crape myrtle green belt is 1.8 kilometers long. The flowers is bright red, like a fireball, lasting for 3-4 months. In the red fire ball crape myrtle under the wood planting red heather and dwarf crape myrtle, red heather four seasons evergreen, do the isolation belt four seasons have considerable scenery.<sup>[6]</sup>

Yingkou Road Longchang Road (Zhoujiazui Road-Kongjiang Road) non-isolation belt and planted 602 hanging crabapple with chest diameter of 4-9 cm in the green space. The effect of the flowering period is March-April, and the fruit period is September-October, which is more spectacular. A total of 7-11 cm of 78 'gorgeous' begonia are planted in the southwest side of

Jingyu Middle Road. Its main characteristics are upright trees, compact trees, purple leaves, gradually becoming emerald green, with good flower and fruit viewing in spring and autumn. In terms of maintenance, after flowering, apply nitrogen, phosphorus and potassium fertilizer to promote the formation of medium and short branches; during the flower bud differentiation, apply quick phosphorus and potassium fertilizer 2-3 times to promote flower bud differentiation; solid long-acting organic fertilizer should be applied after falling leaves in autumn and before spring.

The original cherry blossoms are reserved in the green space to the southeast of Songhua Road, Yingkou Road, the original 2-layer platform foundation is reserved, and colorful laurel is planted in the upper layer of the platform and the lower layer is turf. Colorful laurel under suitable climate conditions, all the year round, the leaves turn white when half-aging, and finally from the central main vein began to both sides, until dark green. Therefore, the application of colorful plants creates a whole green space with four seasons of colorful landscape.



Figure 3 The effect of colored plants on Yingkou Road

#### 3.2. Zhoujiazui Road Beautiful Block

The 204 Buckeye trees with a chest diameter of 17cm on Zhoujiazui Road are all new seedlings. In order to coordinate the tunnel project of Zhoujiazui Road, the pipeline under the tree hole in this section is complex and the construction is difficult, so all of them are manually excavation. After the completion of the river

tunnel and road greening transformation, the overall road landscape is open and clean. Seven chestnut trees magnificent, branches and leaves, crown such as canopy, leaves big and beautiful. The application of 'rattan rainbow' in the central isolation belt of the river tunnel increases the comfort of pedestrians and the beauty of the block.

Table 4. Situation of colorful plants in green space of Xuchang Road

Plant name	Color characteristics and seasonal performance	Quantity
<i>fragrans</i>	Evergreen / flower viewing, leaf / normal color leaves	12
<i>Nata oak</i>	Falling leaves / leaf viewing, drying / autumn leaves	11
<i>Silver ji small wax</i>	Evergreen / leaf viewing, flower viewing / normal color leaves, summer flowers	15

<i>ball</i>		
<i>Big flower rose</i>	Falling leaves / flower viewing / spring, summer and autumn	148 m <sup>2</sup>
<i>The 'Red Prince' brocade belt</i>	Leaves / flowers / summer flowers	46 m <sup>2</sup>

Xuchang road northeast side of 1305 m<sup>2</sup> triangle green space, 11 nata oak for the whole piece of green skeleton, wood configuration big rose, red prince brocade, fire thorn, chrysanthemum multi-color colorful plant collocation, Xuchang road southwest retain original cedar, then configuration red maple, yellow, purple grass, make the space here more "lively".

**4. MATTERS NEEDING ATTENTION WHEN PLANTING**

Soil fertility is the basic property and essential

**Table 5.** Soil detection of green space in Zhoujiazui road and Xuchang Road

Surveillance project	Test method	Technical standard	Sample results	Evaluation results
Ph price	LY/T1239-1999	6.0-7.5	7.47	Qualified
Saltness	LY/T1239-1999 (2010)	0.15-0.9	0.195	Qualified
Organic matter	LY/T1237-1999	12-80	14.4	Qualified

Although soil pH is not a nutrient, it controls plant nutrient availability. Soil pH does not match the associated plants that will be insoluble and absorb nutrients. The pH requirements for the general green planting soil are 5.50-8.0 (CJ / T340- -2011). Soil salt content is the quality of the salt (mainly chloride, sulfate, etc.) in the percentage of dry soil quality. When the salt content is high, the soil salinization occurs.<sup>[8]</sup> The accumulation of salt in the surface soil will not be conducive to the plant to absorb nutrients. Planting soil shall meet the total soil salt content of 0.1% -0.3% (construction standard [2008] No.102).

**5. CONCLUSIONS**

According to the municipal guidance of "four modernizations" construction, compared to the samples of 6 new projects selected in Yangpu District in recent years, the application rate of this sample project is good, but the research on precious and benefit is insufficient, and the control sample is insufficient. However, according to the current situation analysis and evaluation of the Outline of the "Four modernizations" of Shanghai Park Green Space 2018, the overall proportion of precious plants is at a low level, and the overall number of precious plants is insufficient. Although the number of colored plants in the sample of 6 green space in Yangpu District is sufficient, due to the

feature of the soil, and it is the basic ability of the soil to supply and coordinate nutrients, water, air and heat for plant growth. These six pieces of rebuilt green space are all public green space, with large pedestrian and traffic flow, so the original soil is characterized by poor soil, poor nutrition and serious hardening, with poor soil permeability and much water, which will lead to hypoxia and rot of the root system, and even death.<sup>[7]</sup> Therefore, the 6 pieces of green soil have been transformed to a certain extent, and the third party soil testing institutions qualified. The soil test of Xuchang Road, Zhoujiazui Road was qualified (see Table 5).

limitation of time and energy, the length and structure of the paper, the plant selection needs to be further considered and studied on the balance of the four seasons and the ornamental characteristics of the diversity, so as to further improve the visual effect of colored plants in quality.

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