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Analysis of Products Related to Vegetation Blanket

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Abstract Roof greening has gradually become an important component of urban greening. Because of the advantages of low building load and low price, vegetation blanket roof greening has gradually become a widely spread technology of roof greening. In this paper, the characteristics of vegetation blanket roof greening technology are analyzed and summarized, and reasonable suggestions are provided for construction.

Key words Roof greening, Vegetation blanket, Process characteristics

1 Introduction

Compared with the traditional greening which simply copies the ground greening to the roof, the simple greening of the roof is to reduce the cost of construction, maintenance and maintenance difficulty as much as possible by studying the suitable growth substrate, plant and craft system under the condition of the low bearing capacity of the roof and the bad plant growth environment, so as to popularize the roof greening to the maximum extent. The simple roof greening is an important breakthrough for the vigorous development of the roof greening. The vegetation blanket roof greening will become an important trend of the future roof greening because of its advantages of simple construction, low price and rapid landscaping. In this paper, the characteristics of vegetation blanket roof greening technology are analyzed and summarized, and reasonable suggestions are provided for construction.

2 KLD environment-friendly grass blanket

At present, there are two companies in China, KLD International Environment-friendly Vegetation (Beijing) Co., Ltd. and KLD Environment-friendly Vegetation (Jiangsu) Co., Ltd. KLD International Environment-friendly Vegetation (Beijing) Co., Ltd. is located in Daotian Village, Changyang Town, Fangshan District, Beijing City, and the company has a total of 12 MST large-scale production lines. KLD Environment-friendly Vegetation (Jiangsu) Co., Ltd. is located in Suqian Sihong Industrial Park, Jiangsu Province, and it is the agent of German MST Company's environment-friendly grass blanket manufacturing equipment in China. The advantages of KLD Company mainly include German MST's full set of production equipments and process technologies.

KLD environment-friendly grass blanket, adopting German MST's full set of production equipments and technologies, is processed on a large-scale production line, based on rice and wheat straw, together with high-quality straw seeds, nutrients, special paper, moulding net and other materials. The raw materials of KLD environment-friendly grass blanket include rice straw, wheat straw, coconut shell, hemp and other plant fibers. As for the use of KLD environment-friendly grass blankets, it is like carpeting, ecological vegetation can be formed when grass blanket is covered on the treated hillside, roadbed or flat bed and watered and maintained, and the grass seed that is sprayed in advance or brought by grass blanket can germinate and grow. For KLD environment-friendly grass blanket, the combination of nutrient soil, rice and wheat straw, special paper, net and nutrient agent forms the substrate of vegetation. Substrate plays a very important role in the normal growth of vegetation. The substrate should retain water content and nutrients, and its aeration pores can provide sufficient oxygen to facilitate microbial decomposition activities. The substrate should recover rapidly to the desired condition after the vegetation has been stamped and overused.

3 Vertige vegetation blanket

Vertige vegetation blanket can be used for roofing and ground greening, Vertige roof, Vertige *Crassulaceae*® mixed vegetation blankets have two major advantages of rich *Crassulaceae* plant products and independently researched and developed water supply system (irrigation blanket).

3.1 Crassulaceae plants At present, most of the *Crassulaceae* plants for rooftop greening in China are domestic existing varieties. Although the market heat is increasing year by year, there is still a lot of room for development for both varieties and application of rooftop greening plants. There are 10 – 12 different varieties of degradable vegetation blankets planted by Vertige.

3.2 Water supply systems (irrigation blankets) The water supply system of Vertige is a product developed by itself, which is composed of microosmotic pipe and plant fiber layer. The water seeped from the microosmotic pipe is fed with capillary water through plant fibers.

4 "Luditie" vegetation blanket

Huang Aiping, founder of "Luditie", set up Guangzhou Huanggu Decoration Engineering Co., Ltd. in 2002, and began to study the

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problem of roof ecological thermal insulation. After nearly 10 years of research, Huanggu Company developed "Luditie" vegetation blanket in 2008, and the production technology of "Luditie" vegetation blanket is similar to that of *Sedum lineare* seedling, that is, the non-woven cloth or geotextile root reinforcement is used to fix root and form blanket. The main advantage of "Luditie" lies in the full excavation and application of green roofing plant—*Callisia repens*.

Huanggu Company has carried out a long-term screening experiment on many kinds of wild plants in the roofs of South China, comparing their resistance, ornamental features and root growth regularity, and finally selected a fine plant called *C. repens*. *C. repens* is a vine grass of the genus *Phyllostachys* L. native to tropical America. Its root system is slender and shallow. It has a green period of more than 300 d in South China and can reproduce itself after planting. Its root system and cultivation substrate are bonded into one, which can effectively prevent rainwater from washing the substrate and root system penetrating the waterproof layer. The specification of "Luditie" vegetation blanket is 50 cm ×30 cm, the thickness of substrate is 1.5 – 2.0 cm, the coverage of plant is 85% – 100%, and the wet weight of "Luditie" vegetation blanket is 15 – 30 kg/m^2. Nowadays, "Luditie" products have been popularized and applied in Guangdong Province and Jiangxi Province. In 2011, Huanggu Company and South China Agricultural University successfully applied for the inclusion of *C. repens* in *2011 National Grass Variety Regional Trial*, and the Ministry of Agriculture will set up regional trial sites in Guangzhou, Nanning, Wuhan and Quannan.

5 Comparison of products

5.1 Plants Vertige has 10 – 12 Crassulaceae plant species suitable for roof landscaping, greatly enriching the landscape design elements. KLD environment-friendly grass blanket uses the Poaceae plant species, relatively single, the landscape effect is poor. The "Luditie" vegetation blanket plant is *C. repens*, relatively single, and the landscape effect is poor.

5.2 Irrigation Vertige uses the irrigation blanket that is developed independently, and it is stable and can save water. KLD environment-friendly grass blanket and "Luditie" adopt common irrigation or artificial irrigation.

5.3 Cost The cost of roof greening with KLD environment-friendly grass blanket (excluding construction) is 258 yuan/m^2; the cost of roof greening with *Crassulaceae* mixed vegetation blanket is 500 yuan/m^2; the cost of roof greening with "Luditie" vegetation blanket is 150 yuan/m^2.

5.4 Structure KLD environment-friendly grass blanket is manufactured at one time by German MST's complete production equipments, while Vertige and "Luditie" adopt common artificial preculture mode.

5.5 Rapid landscaping KLD environment-friendly grass blanket needs grass seeds after a certain growth period to become a landscape, while Vertige and "Luditie" can become a landscape immediately after the construction.

5.6 Landscape effect Vertige *Crassulaceae* plant has rich colors and good landscape effect, while KLD environment-friendly grass blanket and "Luditie" have poor landscape effect.

6 Conclusions

There are few studies on vegetation blanket in our country, but there are some mature vegetation blanket products in foreign countries. Its complete set of vegetation blanket technology has a lot of experience that we can learn from, but because of the difference of climate and national conditions, our country must develop vegetation blanket technology according to our own specific situation. At present, the rooftop greening in China is still in its infancy, there are many factors that limit the research and development of vegetation blanket technology. It is necessary to further increase research investment in vegetation blanket plants, technology and so on[2].

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