

## Importance, Countermeasures and Suggestions of Autumn Afforestation in Semi-arid Area of the Loess Plateau

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**Abstract:** Afforestation in autumn can optimize the ecological environment and reduce the erosion of sandstorm in the semi-arid area of the Loess Plateau. In view of this, based on autumn afforestation in the semi-arid area of the Loess Plateau as the research object, this paper expounds the importance and practical problems of autumn afforestation, and puts forward the relevant autumn afforestation countermeasures according to the existing problems, hoping to help to improve the ecological environment of the semi-arid area of the Loess plateau.

### 1. Introduction

Sandstorm is the main factor affecting the ecological environment in the semi-arid area of the Loess Plateau. Alleviating the erosion of sandstorm can only be achieved by actively building a green environment. Therefore, afforestation activities are imperative. However, due to the influence of natural environment, capital investment, management mechanism, afforestation level and other factors, afforestation becomes more difficult. In view of this, the countermeasures of afforestation in autumn are discussed, which are of great practical significance to improve the sandstorm environment in the semi-arid area of the Loess Plateau.

### 2. Importance of Autumn Afforestation in Semi-arid Area of the Loess Plateau

People's life, enterprise production and other human activities need to respect the law of natural development, so as to achieve the peaceful coexistence of nature and human beings. With the continuous intervention of modern industry, coupled with people's utilitarian economic operation mode, the environment has been seriously damaged. If these environmental damages are not improved and solved, it is bound to be difficult to form a sustainable industrial development, even having a serious impact on people's lives. The semi-arid area of the Loess Plateau is deeply eroded by wind and sand, especially in the rainless season, it often faces the invasion of sandstorm, which seriously interferes with people's lives<sup>[1]</sup>. In this deteriorating situation, if we do not carry out scientific management and prevention, it will lead to the change of surface soil quality, leading to land relaxation, unable to form a solid geological morphology, so it will also face sandstorm attacks again and form a vicious circle. However, due to the lack of research on the surface morphology, good varieties suitable for sandstorm control can't be found, so many areas are still under the serious threat of sandstorm. After years of research and summary, there are three advantages of autumn afforestation in the semi-arid area of the Loess Plateau: first, it is dry in spring, less rainfall, high temperature and rainfall in summer, good soil moisture in autumn, moderate temperature, small water evaporation, long adaptation period of new seedlings to the soil before freezing in winter, which is conducive to improving the survival rate of seedlings; second, most of the insect pests in autumn and winter converge and cocoon The incidence of various diseases and insect pests is low. When the diseases and insect pests are high in the summer of the next year, the seedlings have survived and grown, and have a certain resistance ability; third, the planting in autumn is staggered from the busy agricultural season in spring, and the labor force is relatively sufficient,

which is conducive to reducing the labor cost. In view of this, the research on autumn afforestation in the semi-arid area of the Loess Plateau plays an important role in improving the sandstorm on the Loess Plateau and creating a green and livable environment on the Loess Plateau.

### **3. Practical Problems of Autumn Afforestation in Semi-arid Area of Loess Plateau**

#### **3.1. Difficulties of Afforestation in Autumn Caused by Natural Environmental Factors**

In general, afforestation will be carried out in spring, but in the natural environment of the Loess Plateau, spring thawing is relatively late, and the problem of spring drought has continued for many years. If afforestation is carried out in spring, the cost of afforestation (watering) will be greatly increased, which is not conducive to the maintenance of the green surface, but also leads to many vegetation unable to survive due to drought due to natural factors, and even more serious sandstorm problems due to soil relaxation caused by afforestation. In addition, although the spring rainfall is less, but the summer rainfall is too concentrated, hot climate, can not meet the planting demand. Autumn planting will often encounter the invasion of bad weather, such as frost, gale and other weather effects, resulting in increased planting difficulty. In addition, the semi-arid area of the Loess Plateau has been eroded by wind and sand for a long time, resulting in the change of surface morphology. Many soil properties are not compact, which is not conducive to the protection of plant root growth, and is extremely unfavorable for new seedlings to better root.

#### **3.2. Lack of Material Guarantee for Afforestation in Autumn Caused by Financial Factors**

The natural phenomenon in the semi-arid area of the Loess Plateau leads to the increase of afforestation difficulty. In this case, in order to ensure the successful completion of afforestation, it is necessary to increase the financial support for afforestation in the semi-arid area of the Loess Plateau. However, according to the relevant data, afforestation subsidy is seriously insufficient, only 3000 yuan per hectare. However, in view of the geological situation in the semi-arid area of the Loess Plateau, this fund subsidy mode is seriously unreasonable, which can't complete the afforestation plan at all. In addition, in the process of financial support, various factors will lead to the slow distribution of funds, the reduction of funds and other phenomena, which lead to the funds can't be used in the suitable planting season, seriously affecting the implementation of the autumn afforestation plan. Moreover, the relevant forestation staff do not know enough about the afforestation task and do not pay attention to the afforestation work, so they can't give technical guidance and seedling support in the process of afforestation on the Loess Plateau, which also leads to the poor development of afforestation in autumn.

#### **3.3. Lack of Professional Technical Guidance for Afforestation in Autumn**

Due to the destruction of nature and society in the semi-arid area of the Loess Plateau, the geology has changed. Therefore, the planting of plants can't be carried out in accordance with the ordinary planting methods, and planting and protecting can only be carried out in accordance with the unique soil changes of the Loess Plateau. However, in the semi-arid area of the Loess Plateau, the afforestation work in autumn is mostly completed by local farmers, who lack the correct understanding of the surface morphology and plant characteristics, leading to the violation of the growth law of plants when planting crops, so it is difficult to ensure the survival rate of planting. In addition, planting is not a simple procedure, and the later maintenance is also very important. However, due to the lack of overall understanding of afforestation and planting, many growers can only complete the initial work of afforestation, but can't maintain the seedlings after planting, which also leads to the low survival rate of plants.

#### **3.4. Unreasonable Afforestation Mechanism**

Afforestation needs a reasonable planning, which is formulated after scientific analysis by professionals. However, the implementation of afforestation plan is not paid attention to. Even due to the delay of implementation, it is difficult to understand the specific content of the plan in the implementation stage, resulting in a big difference between the implementation and planning, which

can't ensure a better implementation of the plan. In addition, there is a lack of training for planting personnel in afforestation planning. Many of the plans are formulated after investigation, rather than afforestation mechanism based on the factors of growers. Therefore, many of the plans can't be implemented by grassroots workers. Moreover, in order to ensure the better implementation of afforestation planning, a large number of check and acceptance work has been set up in afforestation work, requiring the participation of multiple working departments and staff. In addition to the acceptance of grassroots organizations such as villages and townships, there are also inspections of county, city, province and other departments, the temporary spot check of the State Forestry Administration<sup>[2]</sup>. It can be seen that the number of inspections is very large, leading to the growers can't be concentrated on planting failure, but focus more on the inspections. As a result, the quality of afforestation is not guaranteed.

#### **4. Countermeasures and Suggestions on Autumn Afforestation in Semi-arid Area of the Loess Plateau**

##### **4.1. Select Plants Suitable for Semi-arid Area of the Loess Plateau**

Planting in semi-arid area of Loess Plateau should follow the characteristics of surface morphology and select drought resistant and easy to survive tree species scientifically. After years of research and practice, spruce tree species is a good choice. It is not only resistant to cold and drought, not easy to be eroded by wind and sand, but also easy to plant and maintain, which is in line with the characteristics of plant growth in the semi-arid area of the Loess Plateau. In addition, due to the limitation of soil quality in the semi-arid area of the Loess Plateau, it is necessary to select thick soil layer, sandy soil, clay and sandy soil for planting to ensure the nutrition and moisture of the surface soil. For those failing to meet the standards, large seedlings should be planted with soil, watered and fertilized to meet the planting and growth conditions of plants.

##### **4.2. Build Scientific Afforestation Mechanism and Provide Sufficient Financial Support**

Through the above analysis, it can be seen that the current situation of afforestation in the semi-arid area of the Loess Plateau is faced with the lack of funds<sup>[3]</sup>. The main reason is that there is no objective and rational understanding of the afforestation situation in the semi-arid area of the Loess Plateau, so the financial support is unreasonable. In view of this, the relevant departments should strengthen the investigation of afforestation work in this area, go to the grass-roots level to analyze and investigate the specific environment of afforestation, and then formulate the standard of afforestation funds, so as to meet the needs of afforestation and ensure the smooth development of afforestation work. In addition, it is necessary to strictly control the time and amount of payment of afforestation funds, to prevent the delay of fund issuance time and the phenomenon that the fund can't be fully in place caused by the omission of the intermediate link.

##### **4.3. Carry out Systematic Professional Training for Foresters and Provide Technical Support**

Due to the particularity of land and natural environment in the semi-arid area of Loess Plateau, it is required to follow the growth habits of plants in the process of planting, so as to provide favorable conditions for better promoting the survival of seedlings. In view of this, it is necessary to carry out professional technical training for grass-roots growers to make them master scientific planting techniques. For example, in autumn planting, deep planting method and conventional afforestation method can be selected for planting. Conventional afforestation method can make up for the erosion of harsh environment, and seedling preservation method can be used to wait for the appropriate planting time. It is necessary to ensure sufficient water for planting in the deep planting method. Therefore, it is better to choose the zone close to the water source for planting. In addition, it is necessary to enhance the comprehensive service awareness of planters, especially the late management of seedlings after planting, so as to improve the survival rate of seedlings.

##### **4.4. Marketize Afforestation and Improve Responsibility System of Afforestation**

The implementation of afforestation planning depends on the grass-roots staff. Only by giving

full play to the strength of grass-roots staff and setting up a reasonable incentive mechanism, can the quality of afforestation be improved. Therefore, the afforestation work should be put into the development track of market economy, so that resources can be adjusted through the market, so as to stimulate market activities, mobilize the enthusiasm of all parties, and ensure that the comprehensive value of afforestation can be effectively played. In addition, it is necessary to establish a reasonable afforestation supervision system, reduce complicated afforestation procedures, and focus on afforestation planting and maintenance, so as to prevent excessive supervision from causing panic among grass-roots planters.

## **5. Conclusion**

Afforestation in autumn in semi-arid area of Loess Plateau is of great significance and should be popularized. However, due to the poor natural environment and the lack of project funds and professional technical support, it is necessary to select high survival tree species to adapt to the natural environment of the semi-arid region of the Loess Plateau, establish a scientific afforestation mechanism, provide sufficient financial support, mobilize the enthusiasm of multiple participants through market-oriented afforestation, and ensure the successful completion of afforestation. With the development of the times, our people's understanding of environmental protection is more and more profound. As an important means of environmental protection, afforestation and other technical measures are more and more perfect, and forestry seedling technology is more and more valued.

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