

Research on Cultivated Land Quality Improvement Technology and Evaluation Standard

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Abstract

In order to promote the implementation of the strategy of “hiding grain in the ground and storing grain in technology”, improve the national food and important agricultural products guarantee capacity, promote the construction of scientific and technological innovation in China and promote the high-quality development of agriculture to provide intellectual support. The restoration and improvement of rural soil is a very important field. Focusing on the quality of cultivated land, we will continue to carry out scientific and technological research to provide strong scientific and technological support for improving the quality of cultivated land, protecting the ecological environment and ensuring food security.

Keywords

land consolidation; Arable quality land; Planning and designing.

1. Existing Cultivated Land Quality Improvement Technology

1.1. Straw Decomposing and Returning to the Field Technology

Returning straw to the field can increase soil organic matter, improve soil structure, make soil loose, increase porosity, reduce capacity, and promote microbial activity and the development of crop roots. Returning straw to the field has a significant effect on increasing fertilizer and yield, generally increasing yield by 5% to 10%. However, improper methods can also lead to increased soil pathogens, aggravation of crop diseases and seedling shortage (stiff seedlings) and other undesirable phenomena. Therefore, taking reasonable measures to return straw to the field can achieve a good effect of returning to the field.

1.2. Green Manure Planting Technology

Green manure is a biological fertilizer source with relatively complete nutrients, and the main reason for planting green manure is not only an effective way to increase the source of fertilizer, but also has a great effect on reforming the soil. The use of green manure is that they are kept green and will go underground and mix with the soil before flowering. However, the decay of these organisms will affect the effective nutrients of the soil. For these reasons, green manure not only increases humus The content of quality inspection, and it provides very effective oxygen in the soil, but it will do both at very few times and at the same time. Only when the material added to the soil is still very resistant to decomposition, it is this kind of Plant materials usually also contain very low oxygen content, and only have a very high content in the content

of humus. When the increase and the occurrence of materials are mostly used for decomposition and the oxygen content is very high, the climatic conditions and crop conditions The age type will be different.

1.3. Acidified Soil Improvement Technology

Acidic soil is very harmful to the growth of plants, because acidic soil has a serious lack of soil nutrients. On acid soil, apply lime for 10 to 40 kilograms per mu per year until the soil becomes slightly acidic or neutral soil; growers can improve crop varieties, such as planting mung beans, rapeseed, buckwheat, rice and other acid-tolerant crops. Adjust soil acidity through soil preparation management and soil activation; increase farm manure to cultivate soil fertility. Before crops are planted, agricultural fertilizers are mainly applied to soil organic matter to improve soil permeability, increase rhizosphere microbial activity, and transform insoluble mineral elements in the soil. It is a soluble nutrient, so as to achieve the purpose of fertilizing soil fertility. Applying acidic soil amendments has a longer effective period, but the effect is good. Soil structure improvement is through the application of natural soil amendments (such as humic acid, cellulose, biogas residue, etc.) and artificial soil amendments (such as polyvinyl alcohol, etc.) to promote the formation of soil aggregates, improve soil structure, and increase fertility. Fix the topsoil, protect the soil cultivation layer, and prevent soil erosion; implement dry and dry rotation to improve physical and chemical properties. Dry and flood rotation in acid soil (2 to 3 years) can improve soil cultivation and physical and chemical properties. After sowing, mulch and adjust Rice-rice, rape-rice and other planting methods, choose alkaline fertilizers (such as ammonium carbonate, ammonia) to achieve the purpose of improvement, while improving cultivation techniques to prevent soil erosion.

1.4. "Methane Slurry and Residue" Comprehensive Utilization and Fertilization Technology

As a renewable clean energy, biogas can replace traditional biomass energy such as straw and firewood, as well as commercial energy such as coal. Biogas residue is rich in nitrogen, phosphorus, potassium, and middle and trace elements. The comprehensive utilization of biogas residue is beneficial to environmental sanitation, avoiding secondary pollution, reducing chemical fertilizer input, improving the quality of agricultural products and aquatic products, and increasing farmers' income. Therefore, the promotion and application of "pig-methane-fruit", "pig-methane-tea", "pig-methane-fish", "pig-methane-vegetable" and other "methane liquid and biogas residue" comprehensive utilization technologies have broad prospects [1].

2. Cultivated Land Quality Evaluation Standards

For many years, China's cultivated land has been used with high intensity and overload for a long time, the quality of cultivated land has been seriously degraded, and the soil environment has been "red light". The requirements for the quantity protection of cultivated land in various places have been clear and specific, but insufficient attention has been paid to quality protection and the requirements are unclear. In 2015, the State Council formulated the "Measures for the Evaluation of the Governor's Responsibility System for Food Security", which included "the quality of cultivated land" into the assessment indicators, and put forward clear requirements for the protection of cultivated land quality. In 2016, the Ministry of Agriculture promulgated the Measures for the Investigation, Monitoring and Evaluation of Cultivated Land Quality (Ministerial Order No. 2) to further strengthen the construction and protection of cultivated land quality [2]. The national standard of "Cultivated Land Quality Grade" is an important starting point of the "Measures for Investigation, Monitoring and Evaluation of Cultivated Land Quality" and an important foundation for the protection of cultivated land quality. It can be seen that the introduction of the "Cultivated Land Quality Grade" is an important measure to

implement the central government's overall deployment of ecological civilization construction, which is very necessary and urgent [3].

Implementing the most stringent farmland protection system, tightening the “fences” of farmland protection, and sticking to the red line of farmland are the fundamental guarantees for national food security. Implementing farmland quality protection and improvement actions, carrying out high-standard farmland construction, carrying out soil improvement, soil fertility improvement, governance and restoration, curbing the trend of farmland degradation, and improving farmland quality are the only way to achieve sustainable agricultural development [4]. The main foundation and prerequisite are to implement measures to protect the quality of cultivated land and formulate scientific evaluation standards. In addition, there are objective factors such as a vast area and many types of land in China. The existing quality evaluation standards for cultivated land are too general and lack regional characteristics, and should be further optimized on the existing basis [5].

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