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Application of vetiver grass for revegetation in Rare Earth mine , south China

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Key words : RE(Rare Earth) mine , revegetation , environment pollution ,soil erosion , Vetiver grass

Introduction China is the world's largest RE producer and consumer , Guangdong and Jiangxi province , the RE is of the ionic absorption type which is absorbed on clay particles at ionic state only found in China .Due to its advantages in exploiting and components an upsurge had been appeared from 1986 to 1999 . It has bring great benefits and cause a series enviroment problems as well . Vetiver Grass with its unique morphological , physiological ,ecological characteristics and its tolerance to adverse conditions , has a key role in the area of soil erosion control and environmental protection . Main aim of this project was to use vetiver for revegetation and alleviate environmental pollution caused by exploiting RE mines in South China .

Materials and methods Over the past two years a series of research projects conducted at Daping RE Mine ,located at the northeast of Guangdong ,China . Soil erosion is very serious problem in these areas . The trial site , has a gradient of 30-50° . The engineering measurement was conducted first and then the biological method . The engineering measure was dig up a 100 cm wide channel on the top of slope to disperse upper runoff . The biological method was to plant vetiver along contour line in May , 2005 and April 2006 . Contour platforms with a width of 30-40 cm and planting ditches with of 15 cm were first built on a row spacing of 80 cm and then vetiver was planted at 10-15 cm spacing ,3-5 tillers for each slip . After planting water quality ,soil chemical properties and the changes of vegetation community were investigated .

Results 12months after planting Vetiver grass , soil orgnic matter increased from 0.20% to 0.74% , hydrolysable N decreased from 320 mg/kg to 43 mg/kg , SO₄²⁻ decreased from 13.1 mg/kg to 7.46 mg/kg ,EC values decreased from 0.46 ms/cm to 0.062 ms/cm ,NO₃⁻ decreased from 203 mg/kg to 10.2 mg/kg ,available K and total S varied slightly ; pH values of water increased from 3.12 to 4.82 ,NH₃⁻ N decreased from 204.3(N mg/L) to 81.3(N mg/L) , NO₃⁻ N decreased from 78.35(mg/L) to 53.6(mg/L) , SO₄²⁻ decreased from 497.5(mg/L) to 308.5(mg/L) . The result shows that water quality have been improved after palnting Vetiver grass .;Eco-environment has been improved after planting Vetiver grass and suitable growth condition for the nativer plants created . Eight native species , *Borreria latifolia* , *Gynura crepidioides* , *Blechnum orientale* , *Sphenomeris chusana* , *Paspalum conjugatum* , *Ageratum conyzoides* , *Miscanthus chinensis* and *Hypericum chinensis* were found in Vetiver hedge . The result of this experiment has shown that Vetiver grass acts as a pioneer plant growing and provides micro-climatic conditions where native species may become established .

Conclusions Vetiver grass acts as a pioneer plant growing and provides micro-climatic conditions where native species may become established . Vetiver Grass for revegetation in RE mine area was practical . The Vetiver grass technology is a effective way for soil erosion and water pollution control in RE mine of South china .

Reference

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