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Study of meadow brome planting on soil and water conservation

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Keywords: meadow brome, slope, soil erosion modulus, surface runoff, soil and water conservation

Introduction China has one of the most serious soil erosion problems in the world. At present, vegetation is the most effective factor preventing soil erosion (Cerdeira 1999). Grass coverage on slopes is key (Wang Pingqing, 2005). Therefore, with brome grass as test material, a runoff experimental plot was built on 25° slope land in Yanqing county, and the effect and mechanism of brome grass on soil and water conservation was studied. This work verifies scientific theory and demonstrates technical solutions for effective control of soil erosion and rational use of grasses in northern China.

Materials and methods Test materials were brome grass (*Bromus riparius*) which came from Canada. Runoff experimental plots were built on 25° slopes. There were two treatments with Brome-growing areas and bare areas (CK), and three replications, totalling six runoff plots in the same slope. The test field was oriented north to south, and the area of each runoff plots was 2m × 3m. The plots were separated by asphalt felt paper, buried underground 30 cm, above the ground 20 cm, then we set gullies and an outlet pond at the base and sowed grass seed on May 18, 2006 along contour lines, spaced 15 cm. After each rain, we measured the depth of the barrels and calculated the total runoff volume of the slope, then took sampling by whole profile sampler, after filtering, dried the sediment in 105°C oven until the weight was constant.

Results The surface runoff and soil erosion modulus were important indicators of the slope erosion strength. The test results of 25° slope runoff experimental plot in Yanqing in 2006 showed that (Table 1), the effect of lawn Brome planting for erosion control was significant, the surface runoff and soil erosion modulus of CK were 44331.87 m³/km²·a and 7423.56 t/km²·a. The runoff and soil erosion modulus of Brome grass covered were less than the CK, only 14233.19 m³/km²·a and 57.82 t/km²·a.

Table 1 The runoff and soil erosion modulus of different treatments.

treatment	surface runoff m ³ /km ² ·a	soil erosion modulus (t/km ² ·a)	capability of water conservation(%)	Capability of soil conservation(%)
CK	44331.87a	7423.56a	-	-
<i>Bromus riparius</i>	14233.19b	57.82b	67.8	99.3

Note: different letters in same row mean significantly under 0.05 level

Conclusions Brome grass planting played an important part in soil erosion control on 25° slope land in Yanqing. The runoff and soil erosion modulus of Brome grass planting area were 14233.19 m³/km²·a and 57.82 t/km²·a respectively. The capabilities of water and soil conservation were 67.8% and 99.3%.

References

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