

The effect of hay covered on soil evaporation

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Introduction In recent years , much work has been done about covered effect and mechanism in preserving soil moisture by domestic and foreign experts (Qiao Hailong , 2006) . However , there are few researches on the quantitative observation on the inhibitory effect of soil evaporation .Grass hay production system is an important biological resource . With hay as test material , this paper studied on the effect of soil evaporation by different coverage of hay and explored the mechanism .With a view to restoring grassland ecological environment and providing a theoretical basis and technological support for desertification control .

Materials and methods The test material was typical sandy soil taken from Xilamuren grassland . The soil was air-dried and handled through 2 mm sieve , then stuffed the uniform soil into the flowerpots with diameter 28 cm , high 34 cm . Each flowerpot weight 7.35 kg , A total of five treatments were planned , and the coverage rates were 0 , 25% , 50% , 75% and 100% . Each treatment contained five replications . The flowerpots were displayed randomly with interval space of 0.5 m , and the water was added into flowerpots until saturated . In order to simulate natural conditions , 20 g sandy soil was spreaded on the surface of hay , and a preservation membrane was covered for 24 hours . Soil evaporation was measured with Electronic Scale of precision 0.5 g . The observation for every two hours is needed in the first 72 hours time , after that at 9:00 am every day .

Results as table showed , in the evaporation process , the cumulative evaporation of bare soil was the largest . With coverage increasing , the amount of cumulative evaporation reduced gradually . In the first four days (96 hours) , the accumulated evaporation of different treatments showed significantly that 100% coverage had a great inhibition on soil evaporation , and the inhibition rate can reach 48% . With the increase of time , the difference between the groups became exiguous . Multiple test results showed that during this period of the 5th to 8th day , the accumulative evaporation of 0 , 25% and 50% differed slightly . While the difference of accumulated evaporation of 75% and 100% was significant , and the inhibition rates were 9.3% and 4.8% . This is because after a long procession of evaporation topsoil moisture decreased gradually . As a result , the intensity of evaporation reduced .

Table 1 The accumulated evaporation of different treatments .

coverage rate (%)	accumulative evaporation(g)							
	1d	2d	3d	4d	5d	6d	7d	8d
0	361a	572a	664a	737a	750a	783a	807a	821a
25	331b	520b	639b	722b	741b	775a	800a	813a
50	299c	460c	588c	713c	740b	781b	807a	819a
75	239d	385d	514d	635d	662c	701c	728b	745b
100	191e	306e	417e	618e	677d	729d	762c	782c

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

Conclusions Different degrees of coverage can inhibit soil evaporation effectively . 100% coverage had a greatest inhibition on soil evaporation , and the inhibition rate reached 48 percent . With coverage increasing , the amount of accumulative evaporation reduced gradually .

Reference

Qiao Ha-Long . (2006) . Effects of straw deep mulching on soil moisture infiltration and evaporation .[J] *Science of Soil and Water Conservation* , 2006 , 4(2) :34-38 .