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极端干旱区漏斗状塑料瓶的节水栽培性能

Performance of funnel-shaped plastic bottle for water saving cultivation in extreme arid region

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中文摘要:

为解决缺水高渗透地区新栽植物难以存活问题,该文通过室内实验与现场试验研究了塑料瓶的节水栽培性能。室内模拟不同的水分散失条件,连续多日定时测试塑料瓶内砂土的含水量,回归分析剩余含水量随时间的变化函数。结果表明:温度越高,水分散失速度越大;由饱和含水量至萎蔫含水量,在室温(22±1)℃下可以间隔9 d浇水1次;漏斗状比直筒状瓶有利于延迟水分渗透;砂粒与有机肥比黏粒有利于锁住水分,可用以调节水分散失速度。现场栽植试验(有瓶与无瓶)比较亦证实该方法的有效性。由于漏斗状塑料瓶具有留存水流与延迟渗透的节水功效,有利于缺水或高渗透地区草、灌木植物的栽培。

英文摘要:

In order to resolve the plants survival difficulty in high permeability or water-shortage area, the water-saving cultivation by funnel-shaped plastic bottle was studied through laboratory and field tests. Different water losing conditions were simulated in the laboratory to continuously test water content of sandy soil in the plastic bottle every day. Then, the regressive function was built to describe the relationship between remaining water content in sandy soil and time. Testing Results showed that the higher the environment temperature was, the greater the rate of water loss. From the saturated water content to the wilting water content, an interval of watering could be 9 days at room temperature((22±1)°C).The funnel-shaped bottles could delay water loss compared to straight cylinder-shaped bottles. Sand particles combined with organic fertilizers were more facilitated to conserve water than clay soil, and they could be used to adjust the rate of water loss. Field planting tests (with bottles and without bottles) confirmed its water-saving effectiveness. Due to high efficiency of water accumulation and saving, funnel-shaped bottles can benefit plants cultivation in high permeability or water-shortage area.

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