

## PAM(聚丙烯酰胺)应用于西北黄土地区旱作农业的经济分析

### Economic feasibility of PAM application in rain-fed agriculture in the loess regions of Northwest China

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中文摘要:

我国西北地区雨养(旱作)农业面积广大、产量低而不稳。水是限制农作物产量的关键因素。地表使用PAM可以提高降雨入渗、提高作物产量。该文从理论分析和试验数据出发, 研究用PAM进行旱作农业的经济性。分析了作物产量函数关系, 得到PAM降雨入渗增加和作物产量增加的关系。由试验数据, 得到了用PAM增加作物可用水量的定量关系。建立了定量计算不同降雨量、作物价格和PAM成本比条件下采用PAM提高作物生产经济效益的函数关系。用相关数据计算得到用PAM种植玉米的经济效益。结果表明种植玉米使用PAM可以产生很好的经济效益。说明在西北黄土地区用PAM进行旱作农业在经济上是可行的。

英文摘要:

There is a vast rain-fed agricultural (dryland farming) region in the Northwest China, with low and unstable yield. Water shortage is the main restriction responsible for low crop yield. It is well known that surface application of PAM (Polyacrylamide) can increase rainfall infiltration, which increases crop yield. The objective of this study was to investigate the economic feasibility of applying PAM in rain-fed agriculture, through theoretical analysis and with experimental data. From crop water production function, the relationship between increased infiltration of rainfall through PAM application and the increased yield was developed. Experimental data were used to quantify the increased water availability to crop under PAM treatment. A function was derived for computing the economical benefits of PAM application under different conditions, such as annual precipitation, the ratio of crop price to PAM cost. The relevant data were used to calculate the economic benefit of using PAM in corn production. The results indicate that PAM application in corn has sound economic return, which demonstrate great potential of using PAM in rain-fed agriculture in the loess regions of North Western China.

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