

滴灌系統規劃之案例探討-以新竹縣竹東鎮某一農地為例

Case Study on Drip Irrigation System Planning - a Farmland in Zhudong Township, Hsinchu County

農業部農田水利署新竹管理處

處長	主任工程師	專門委員	管理組長
林賢正	童憶茹	簡大為	陳鴻鈞
Hsien-Cheng Lin	Yi-Ru Tong	Ta-Wei Chien	Hong-Jun Chen

農業部農田水利署新竹管理處

灌溉股長	督導股長
胡穎任	林友德

Ying-Ren Hu	You-De Lin
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財團法人農業工程研究中心

副研究員
姜世偉

Shih-Wei Chiang

摘要

農業經營採用管路灌溉不但可提高水資源利用效率，並且由於精準控制灌溉水量，亦有提高作物品質增加農民收益之優點。其中，滴灌系統係利用管路系統壓力給水，有效節省灌溉水量且可達灌溉均勻度佳之效。本研究以一處位於新竹縣竹東鎮農地為研究案例，其主要種植作物為草莓，採取露天栽培方式，灌溉水源來自抽取地下水並經 RO 處理，灌溉型態採用滴灌系統進行規劃。首先利用聯合國糧農組織(FAO)所發展之 CROPWAT 模式計算作物需水量，並以灌溉地面積為基礎計算最大日需水量做為灌溉系統設計之基礎，以至少能滿足 1 日灌溉用水量為蓄水池容量之設計，再配合灌溉地坵塊形狀、地形地勢、道路以及水源位置，灌溉系統規劃以抽水機自蓄水池抽取水源後由引水幹管接至田區主管，主管布設於田區中央，長度約 30 公尺貫穿整個田區，支管以間距 2.5 公尺垂直於主管再配合滴頭間距 0.2 至 0.3 公尺布設。

關鍵詞：農業水資源，管路灌溉，灌溉用水量

Abstract

Applying pipe irrigation can not only improve the efficiency of water resource utilization but also improve the quality of crops and increase farmers' income. Among them, the drip irrigation system uses the pressure of the pipe system to supply water, which effectively saves irrigation water and achieves the effect of good irrigation uniformity. This study uses a

farmland located in Zhudong Township, Hsinchu County as a research case. The crop is strawberry cultivated in the open air. The irrigation water source comes from groundwater extracted and treated by RO. The irrigation pattern is planned to apply a drip irrigation system. First, the CROPWAT model developed by the Food and Agriculture Organization of the United Nations (FAO) is used to calculate the crop water requirement. The maximum daily requirement is calculated based on the irrigated area for the design of the irrigation system. The reservoir capacity is designed to at least meet the daily irrigation water demand. Combined with the shape of the irrigation land, topography, roads and water source location, the irrigation system is planned to use a pump to draw water from the reservoir and then connect it to the field main pipe through the water diversion main pipe. The main pipe is laid in the center of the field, with a length of about 30 meters running through the entire field. The branch pipes are perpendicular to the main pipe at a spacing of 2.5 meters and are arranged with a dripper spacing of 0.2 to 0.3 meters.

Keywords: agricultural water resources, pipeline irrigation, crop water requirement