

111 及 112 年度石門水庫集水區加強非點源污染削減及水源保育推動

Improving the Non-Point Source Pollution Reduction and Promoting Water Resource Conservation in the Shihmen Reservoir Watershed in 2022 and 2023

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摘要

為改善石門庫水質，北區水資源分署在石門水庫集水區推動「非點源污染削減-合理化施肥」措施，透過土壤肥力檢測調整施肥量，藉由減少施肥量降低進入庫區之非點源污染量。計畫挑選綠竹筍和水蜜桃園區各一公頃區域，減少 25%之肥料施料用量，並與一般施肥區域之竹筍及水蜜桃產量進行比較，結果顯示，相較於一般施肥區，合理化施肥區之綠竹筍或水蜜桃並無明顯差異，但產量及產值均略高於一般施肥區。而綠竹筍種植區域之水質檢測結果則顯示，在兩場不同的降雨事件中，合理化施肥區之出流水總磷濃度約分別減少 87%及 34%。而由於肥料的使用量減少，1 公頃的綠竹筍園和 1 公頃的水蜜桃園共減少 1339 kg CO₂e 碳排量，相當於 112 顆大樹每年吸收的碳量。

計畫執行初期，農民擔心施肥減量會影響作物產量與品質，進一步影響產值。因此，於 2023 年引入企業認養農地方案，降低農民對農產品減產的擔憂，也增加農民參與合理化施肥試驗之誘因，而試驗結果亦增加了農民對於合理化施肥的認同與信心，使農業朝向更永續的經營方式前進。在企業端，企業藉由認養農地方案，亦能提升社會責任形象；在農民端，農民藉由減少施肥量，降低肥料及人力成本，又能提高作物產量及產值；在一般社會大眾端，則因農民減少肥料施用，降低進入水

庫水體之非點源污染量，社會大眾可享有更優質水源。這是一個多贏的解決方案，也符合聯合國永續發展目標。

關鍵詞：合理化施肥，水源保育，ESG，碳排，永續發展

ABSTRACT

To improve the water quality of the Shimen Reservoir, the Northern Region Water Resources Branch has implemented a "non-point source pollution reduction - rational fertilization" measure in this watershed area. This initiative adjusts the number of fertilizers applied based on soil fertility tests to reduce non-point source pollution entering the water body of the Shimen Reservoir.

The project selected one hectare each of green bamboo shoots and peach orchards to reduce fertilizer application by 25%. Production in these areas was compared with traditionally fertilized bamboo shoots and peaches. Results showed that while there were no significant differences in yield between the rational fertilization and traditional fertilization areas for green bamboo shoots or peaches, both yield and value were slightly higher in the rational fertilization areas. Water quality testing in the green bamboo shoot planting area revealed that during two separate rainfall events, total phosphorus concentrations in runoff were reduced by approximately 87% and 34%, respectively in the rational fertilization areas compared to traditional fertilization areas. Due to reduced fertilizer usage, the cultivation of one hectare each of green bamboo shoots and peach orchards resulted in a total reduction of 1,339 kg CO₂e carbon emissions, equivalent to the amount absorbed annually by 112 large trees.

In the early stages of the project, farmers were concerned that reducing fertilizer application might affect crop yield and quality, thereby affecting their overall production value. Therefore, in 2023, an enterprise-sponsored land adoption program was introduced to alleviate farmers' concerns about yield reduction. This initiative also increased incentives for farmers to participate in rational fertilization trials. The results of the trials further strengthened farmers' confidence and acceptance of rational fertilization practices, paving the way for more sustainable agricultural practices. From the perspective of enterprises, participating in the land adoption program enhances their corporate social responsibility image. For farmers, reducing fertilizer application not only lowers

costs in terms of fertilizers and labor but also enhances crop yield and value. For the general public, reduced fertilizer use by farmers decreases non-point source pollution entering reservoirs, leading to higher-quality water sources for the community. This represents a win-win solution that aligns with the United Nations Sustainable Development Goals.

Keywords : rational nutrient management, water source, conservation, ESG ,carbon emissions, sustainable development