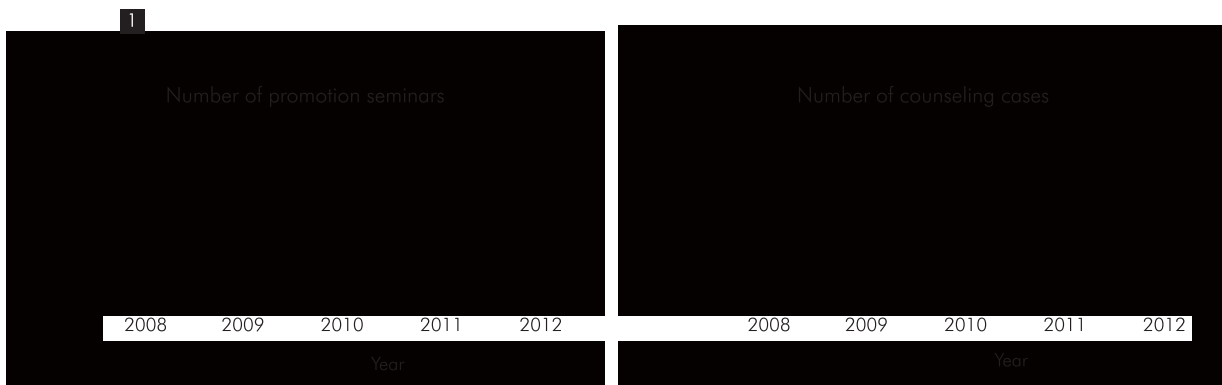


土壤肥料

土壤肥料致力於推動土壤營養診斷、合理化施肥技術，以及炭化稻殼介質開發等，期增加農民肥料使用效率、促進土壤永續管理。

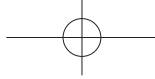
自 97 年開始，平均每年辦理土壤特性及合理化施肥講習 23 場次 1,450 人次參加，田間成果說明會 17 場次 1,110 人次參加，配合政策宣導共 140 場次。每年分析樣品達 3,600 件，為 540 人次提供土壤管理及施肥推薦服務。為加速為民服務效率，除購買分析速度更快的新型儀器外，亦調整分析流程，將土壤樣品分析時間由原本的一個月縮短至 2 週，每年節省農民等待時間 5 萬餘天。其中服務人次以每年 13% 穩定持續成長，每年二千餘件之土壤樣品，經統計分析結果顯示，各項檢驗數據落在合宜範圍的比例亦皆有上升的趨勢，顯示合理化施肥觀念推廣成效良好。



在合理化施肥技術研發方面，建立文旦、高接梨及金柑等作物之植體營養診斷標準，並建立水稻、硬質玉米與上述作物之營養管理技術，以協助農民掌握最佳養分供應、土壤肥力現況及最適施肥時期。另每年至少採取 200 件作物及土壤樣品充實土壤資料庫，以便未來利用農業環境地理資訊系統評估農產品安全性。

在建構優質土壤環境技術方面，建立分子生物學方法調查農田土壤微生物多樣性之技術，以客觀分析及評估有機農業對生態環境之影響；建立抗氧化能力分析技術，以證明有機栽培確實能增加農產品的營養價值；建立有機葉菜類農場之副產物及肥培整體管理技術，降低有機蔬菜農戶用肥及廢棄物處理成本。

為開發優良之栽培介質以及土壤改良資材，設計附掛式稻殼炭化裝置，每公噸稻殼可產生 300 公斤的炭化稻殼，以及副產品稻殼醋液 150 公升，可增加 7 萬元以上的收益，大幅提高稻殼附加價值並創造出新的綠色產業。

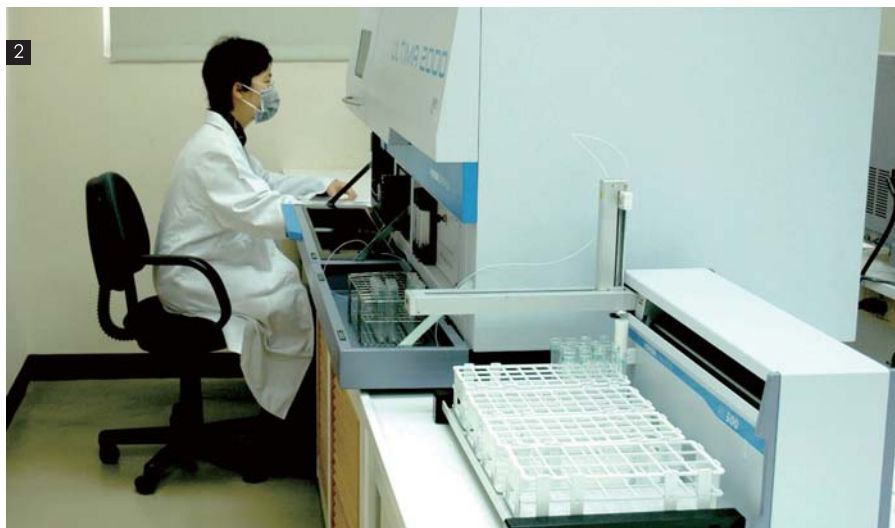


Soil and fertilizers

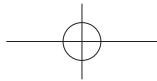
The objectives of soil and fertilizers are to promote the diagnosis of soil nutrition, rational fertilization techniques, and the development of culture medium made from agriculture substrate resource. These endeavors are expected to increase farmers' fertilizer usage efficiency and promote sustainable soil management.

Since 2008, an average of 23 seminars on soil properties and rational fertilization have been held each year, attracting an annual average number of 1,450 participants; the average number of field achievement seminars hosted per year is 17, with 1,110 participants; and the average number of events organized to help advocate government policy is 140. The number of samples analyzed annually is 3,600, which enables the provision of services such as soil management and fertilizer recommendations to 540 people per year. To improve the efficiency of public service, we not only purchased new equipment featuring fast analysis speed, but also adjusted the analysis process by reducing the soil sample analysis time from 1 month to 2 weeks. This decreases the time that farmers must wait each year by more than 50,000 days. The number of people served has grown steadily at 13% per year, and over 2,000 pieces of soil samples have been analyzed. Statistical analysis indicated an upward trend in test data falling within the appropriate range, indicating favorable results concerning the promotion of the rational fertilization concept.

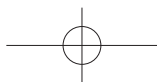
Regarding the research and development of rational fertilization techniques, nutrient diagnosis standards of crops such as pomelos, grafted pears, and kumquats were established. In addition,

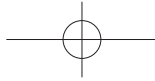


1. 花蓮區農業改良場97-101年合理化施肥推廣統計圖
Statistical charts on the promotion of rational fertilization from 2008 to 2012.
2. 本場建立完善之土壤檢測設備，免費替農民檢測土壤
Comprehensive soil testing equipment was constructed to help farmers test soil quality free-of-charge.



3





nutrient management techniques for rice, feed corn, and the aforementioned crops were developed to help farmers understand the optimal nutrient supply, soil fertility, and the optimal fertilization period. At least 200 crop and soil samples were collected each year to enrich the soil database. These data can be used by the agricultural environment and geography information system in the future to assess the safety of agricultural products.

Concerning the techniques used to develop high-quality soil environments, we established the molecular biology method for investigating the diversity of microorganisms in farmland soil and performed objective analyses to evaluate the effect of organic agriculture on ecological environment. In addition, we introduced a technique for analyzing antioxidant capacity to prove that organic cultivation can increase the nutritional value of agricultural products. Furthermore, we proposed techniques for comprehensively managing the byproducts and cultivation of fertilizers in organic farms growing leafy greens and reduce the amount of fertilizer used by organic vegetable farmers as well as the cost for waste treatment.

To develop high-quality cultivation mediums and soil improvement materials, we designed hanging type biochar maker. Each ton of rice hulls can produce 300 kg of carbonized rice hulls and 150 L of byproduct rice hull vinegar solution, increasing revenue by more than NT\$70,000. The increased revenue significantly increased the added value of rice hulls and engendered a new green industry. 🌱

5



3. 舉辦合理化施肥田間成果說明會，推廣合理施肥方法
Seminars on the field achievements of rational fertilization were hosted to promote rational fertilization methods.
4. 附掛式稻殼炭化裝置大幅提高稻殼附加價值
The hanging type biochar maker increased added value of rice hulls.
5. 炭化稻殼
Carbonized rice hulls.