

健康種苗是農業升級關鍵 - 專訪青年農民張祿棠



圖. 張祿棠先分享他的文心蘭栽培心得

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臺南白河素以關子嶺溫泉、水火同源等景點聞名，更是全國歷史最悠久的蓮鄉，每年夏季來白河賞蓮拍照的遊客絡繹不絕。白河也是臺南重要的農業產區，不僅有前面提到蓮花所衍生的蓮藕、蓮子，還有竹筍、洋香瓜、柳橙等農產品。近年，青年農民在文心蘭與紅龍果的投入與獲獎肯定更為當地的農業創造新的發展契機。

張祿棠畢業於國立臺灣大學園藝學研究所，具豐富農業專業知識。身為臺南子弟加上對農業的熱忱，畢業後不久即返回臺南家鄉投入農業生產，在白河找到開始他專業務農的基地。

張祿棠初期以火鶴花生產為主，火鶴花栽培過程中細菌性葉枯病的防治對花卉品質與產量具關鍵性的影響，讓張祿棠自此對田間衛生的管理非常重視。『對園區內的清潔要非常注意』，張祿棠說，『避免因帶入病蟲害而造成管理上的困擾與後續衍生的防治支出，甚至是嚴重的損失。』現在他以文心蘭、萬代蘭及觀葉植物等的種苗供應為主，106年獲選為第四屆百大青農，接受種苗改良繁殖場的陪伴輔導。

『每次投入新的種苗類別，都會實際地瞭解作物特性與生產面的問題，藉由和客戶更多的技術對話，提供更適合的品種。目前新投入的項目是紅龍果果實及種苗生產』，站在正進行排水改善的田區旁，張祿棠細細地說明田區的位置、地勢與周邊隔離帶，『整個園區幾乎被竹林包圍，通常我們也不太會帶人進來。

在田間衛生管理上，溫室或果園中疏花疏果後與帶有疑似病徵的殘體我們都會把它移出去。在人員管理層面，人員進出都務必進行清潔消毒，包含鞋底與手部，減少病蟲害，也才能夠降低防治的成本。』

健康種苗是張祿棠對文心蘭和紅龍果栽培最重視的環節。『一些重要病害，如病毒病及潰瘍病等，極有可能隨瓶苗或扦插苗被引入』，以紅龍果為例，建立健康母本園，建立好的品質管理，配合生產者本身選拔出來的品種、品系，未來可以發展出穩定的健康種苗體系，協助產業生產出更高品質的紅龍果，而且『健康種苗的導入也有助於降低病害防治、人力等生產管理的成本。』

最後張祿棠聊到關於智慧農業的運用。通常，農友多藉由經驗的累積與交流作為田間管理作業的判斷依據，但是很多細微的徵兆不容易靠人力觀察取得，加上近年氣候不穩定因素，同時隨著栽培規模擴大，更需要有精準、量化的數據可供參考，因此張祿棠頗肯定政府對智慧農業的推動。『目前在農場運用感測儀器蒐集微氣候數據，再進一步做數據分析，可以協助我了解及預測作物的生長，幫助我決定如何更有效率地管理作物，有方向地達到提高品質與利潤的目標。』

結束訪談，張祿棠馬不停蹄要趕去屏東和其他農友交流，不斷追求栽培技術的進步與產品品質的成長是他目前最重要的工作，付出的心力在他園中綻放出明亮的朵朵黃花與結成一顆顆碩大紅豔的果實～

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SPF seedlings are the key to agricultural upgrading- interview with a young, enthusiastic farmer Mr. Lu-Tang Chang

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Baihe Township in Tainan is known for 'Guanziling Hot Spring' and 'Fire and Water Spring' and is the historical lotus village so that a lot of tourists visit there every summer. Baihe is also one of important agricultural areas in Tainan. Not only lotus roots and lotus seeds but also bamboo shoots, muskmelons and oranges are produced in Baihe. In recent years, some young farmers focused on oncidium and pitaya cultivation and got the affirmative by prizes that create an opportunity for agriculture development.

Mr. Lu-Tang Chang graduated from institute of horticulture, National Taiwan University and has extensive agricultural expertise. He was born in Tainan and has passion for agriculture so that he returned to Tainan and entered into agricultural production at Baihe soon after graduating.

Initially, Mr. Chang focused on Anthurium cultivation. The control of bacterial leaf blight is the key factor to flower quality and yield of Anthurium that makes Mr. Chang seriously recognizing the importance of field sanitation. "We have to pay close attention on field sanitation", Mr. Chang said, and "which could decrease the invasion risk of pests and pathogens that can cause problem and expenditure for diseases control and management, even serious losses." Now he focuses on oncidium, vanda and foliage plants for seedlings supply. Mr. Chang was even selected as one of the 'Hundred Young Farmers' in 2017 and is tutored at present by TSIPS.

"When I try a new kind of seedling cultivation, I always study practically the features of the crop and the problems for production. By more communication on cultivation technique with customers, I can provide a suitable variety in accordance with customers' demand. Currently, I just started investing on the production of pitaya fruit and seedlings." Mr. Chang said, standing next to the orchard where drainage is being improved. He elaborated on the location, topography and surrounding barriers of the orchard. "The whole orchard is almost surrounded by bamboo forest and we seldom let people come to the orchard. In the orchard and greenhouse management, we remove all the debris out after flower and fruit thinning or suspected symptoms appearing. On the personnel management, personnel access is sure to make disinfection, including the shoe bottom and the hands, in order to reducing the risk of pests and diseases and also reducing the cost of control."

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Mr. Chang believes that SPF (Specific Pathogen Free) seedling is the most important part during the orchidium and pitaya cultivation. “Some major diseases, such as viral diseases and canker, are suspected to be introduced into greenhouse and orchard by seedlings.” For example as pitaya, in concert with growers’ select varieties, a mother-stock garden and good quality management could be established and a stable SPF seedling system would be developed in future. That will help growers produce higher quality pitaya. “Introduction of SPF seedlings also helps to reduce the cost of diseases control and manpower management.” Mr. Chang remarked.



Fig.. Mr. Chang with his pitaya orchard.

Finally, Mr. Chang talked about the use of intelligent agriculture. Usually, farmers decide what-to-do and how-to-do majorly according to the experience from themselves or other farmers, but many subtle signs are not easy to obtain by human observation. Coupled with recent climatic instability and with the acreage expansion, farmers need accurate, quantitative data for reference. Therefore, he agrees with government action for promoting intelligent agriculture. “Now I use the sensing instruments to collect the data of microclimate and then the data is further analyzed. The results can help me understand the crop and forecast the development of the crop. Therefore, I can decide how to manage the crop effectively and how to increase the quality and profit.”

At the end of the interview, Mr. Chang rushed to Pingtung to meet other farmers for communication. Constantly pursuing the progress of cultivation technology and the improvement of fruit quality is his most important task at present. His efforts, in the greenhouse and orchard, are turning into bright yellow flowers and huge red fruits.

107 期 勘誤公告：

中國大陸基因編輯作物發展近況 Genome editing for crop improvement in China

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勘誤前：

前言自第 16 行：本篇內容主要依據 2019 年 8 月最新國際科學期刊報導內容為基礎，綜整目前中國大陸基因編輯作物發展應用概況提供各界參考。搭配多種去除病毒的技術，以達到較高的去病毒效力，然後再藉由病原檢測技術如血清診斷 (Enzyme linked immunosorbent assay, ELISA) 或反轉錄聚合酶連鎖反應 (Reverse transcriptase polymerase chain reaction, RT-PCR) 作進一步確認，因此，本文乃針對菊花去病毒技術進行介紹，藉以提昇菊花產業在國際間的競爭力。

勘誤後：

本篇內容主要依據 2019 年 8 月最新國際科學期刊報導內容為基礎，綜整目前中國大陸基因編輯作物發展應用概況提供各界參考。