THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

微泡自動耕作系統
Hybrid Irrigation & Husbandry System (HIGH System)

一套集合傳統土基耕作和現代水耕法優點的綠色農業系統
A green farming system that integrates the advantages of traditional soil based farming and modern hydroponic culture

HIGH系統的農作物栽植基座採用預封裝（及可選擇性預播種）設計。栽植基座的養分由農業廢料製造，經特別計算，能確保農作物在生產週期內健康生長。

HIGH系統會循環使用灌溉水，內設的智能電路能夠按農作物品種和氣候調整水量，並通過臭氧和微泡控制系統調節水的十多種物理化學特性。

電源 (每個單位)： Power (each unit):	220V AC、最大 5A、每小時 200W (選項: 可以用太陽能電池板驅動) 220V AC Max 5A, 200W per hour (option: can be driven by solar panel)
電腦控制： Computer control:	全電腦化或半自動灌溉週期。每天1到 24 次定時灌溉 (例如每2個小時1次，1天 12 次) 或在任何預定時間 Fully computer or semi-processor control for irrigation cycle. Daily 1 to 24 irrigation cycles on regular internal (e.g. every two hours, 12 cycles a day) (e.g. 例如 06:00, 08:00, 10:00, 12:00, 13:00, 14:00, 15:00, 16:00, 18:00, 20:00, 22:00, 02:00)
灌溉週期： Irrigation cycle:	1. 從儲水箱抽水開始灌溉 (20 － 40 升水箱)， 灌溉水會通過臭氧和微泡控制系統。 2. 灌溉水每小時會加添 0.5 至 1.0 g 臭氧 3. 可以預定每個週期的臭氧化時間 4. 臭氧系統可為每公升蒸餾水添加多達0.05 毫克臭氧 5. 微泡系統: 臭氧水然後經進一步處理，加入微泡並呈乳白色 6. 把含臭氧和微泡的灌溉水導入栽植盤 7. 一旦灌溉水量達到預定水平，系統會停止灌溉 8. 排水系統的設時器啟動 9. 可以預定和編程排水時間 10. 一旦到了預設的排水時間，栽植盤中的水會被導回儲水箱循環使用，並完成灌溉週期 1. Start irrigation: water is pumped from water storage tank (20 to 40 L tank provided) and passes thought the ozonation and microbubble control system 2. Water is ozonated in the rate of 0.5 to 1.0 g ozone per hour 3. Each cycle's ozonation time can be predetermined 4. The ozonation system can dissolve 0.05 mg ozone in 1L distilled water 5. Microbubble generation system: ozonated water is then processed here and becomes milky in the presence of microbubbles 6. Ozonated water with microbubbles is then applied to the planting system 7. Water irrigation is terminated once the water level in planting pot achieves the pre-determined water level 8. The timer in the drainage control is triggered to start timing 9. The time can be predetermined and programmed 10. Once the preset time in drainage cycle is reached, the water in the planting pot is recirculated (by pumping or by gravity) to the water tank. An irrigation cycle is completed
灌溉範圍： Serving area:	每個系統可以灌溉約20平方米栽植空間 Each system can cover a plant area of about 20 meter square
產量： Production:	視乎植物種類和氣候條件，每平方米栽植空間每月可生產約 5 公斤的農作物 About 5 kg of crop per meter square per month, depending on plant species and climatic conditions
選擇性配件： Optional facility:	照明系統 Lighting system

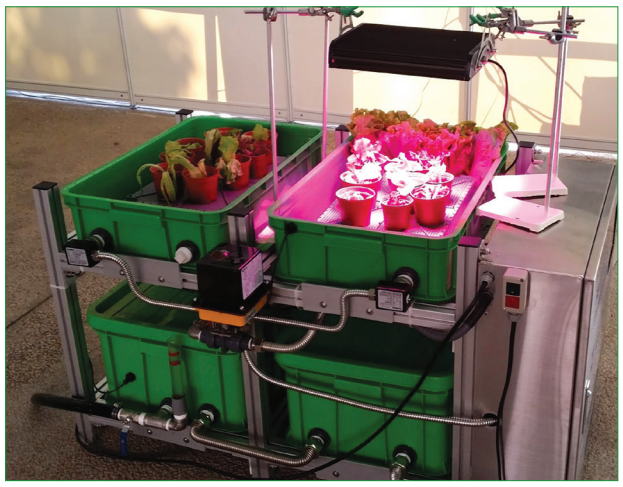
系統規範
Specification of the proto type model

特色與優點

- 環保農業生產系統，只需極少的人力就可栽植出健康蔬菜，適用於大規模農業生產及較小規模的家庭種植基地
- 大多常見蔬菜的生產週期能縮短為3-6個星期

應　用

HIGH系統原為蔬菜生產而設計，但只需少量改動，就可應用於觀賞魚或食用魚的養殖上



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The HIGH System

The HIGH System uses pre-casted (and optional pre-seeded) planting base for crop (mainly vegetable) production. The nutrients provided in the planting base are from environmentally-friendly agricultural waste. Since they are engineered specially for plant root development, it can assure healthy vegetable growth during production cycles.

Water is recirculated in the HIGH System. It is equipped with integrated circuit control for crop irrigation. The control can be programmed easily according to the actual need of the cultivar and climatic conditions. Over 10 physicochemical properties of the water are controlled when the water passes through the ozonation and microbubble system.

Special Features and Advantages

- Environmental friendly farming system requiring minimal manpower - suitable for both mass agricultural production and smaller scale family based planting for provision of healthier vegetables
- Shorten crop production cycle to 3-6 weeks for common vegetables under suitable growing conditions

Application

Although HIGH System is designed for vegetable production, with minimal modification, it is also suitable for ornamental or edible fish husbandry

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