

Ekasit Wattanapreechanon 2014: Development of Soilless Culture for Crop Production in Thailand. Doctor of Philosophy (Tropical Agriculture), Major Field: Tropical Agriculture, Faculty of Agriculture. Thesis Advisor: Associate Professor Patana Sukprasert, Ph.D. 214 pages.

Thailand has a high demand for safe vegetable especially to serve local consumption for over 22 million a year of tourists. Growing number of tourists and health conscious Thai people are the important market for hydroponic vegetable production. The objective of this research was to identify appropriate soilless culture systems for cash crops, like temperate lettuce and herbs that are normally imported, and for some other popular local crops.

The study comprised of 2 phases : the first phase : studied and identified hydroponic systems in Thailand and other countries, the collected data and information will be analyzed and synthesized to identify the advantages, disadvantages problems and solutions suitable for crops and efficiency. Then trials will be conducted to develop the system that are appropriate to local conditions and resources and revised the data by focus group technique. The second phase: interviews of 58 farmers to collect information and follow up on soilless culture technology transfer.

The result from the first phase indicated that 1) soilless culture systems for crop production used in Thailand were: dynamic root floating techniques (DRFT), nutrient film techniques (NFT), substrate culture, deep flow techniques (DFT), and aeroponics; and 2) DRFT, NFT and DFT were appropriate for vegetable production, but substrate culture was suitable for fruit vegetables. In the second phase, it was shown that 1) Farmers were in favor of the hydroponic techniques in the following order: the Nutrient Film Techniques (NFT), Dynamic Root Floating Techniques (DRFT) and Deep Flow Techniques (DFT) for their soilless growing of leafy vegetable while the Substrate Culture Technique is more suitable for fruit vegetables. 2) Most farmers learnt and adopted the soilless culture technology, but they modified the equipments using local material to cut the cost. 3) Most farmers in this group were well-educated, adopted the appropriate soilless culture technologies and grew temperate leafy vegetable by using NFT. 4) Those farmers were interested in improving the growing techniques to meet the standard for each individual vegetable variety as well as trying to reduce the cost and adapting the equipment by using local materials.

In order to undertake the hydroponic production, growers need to 1) to obtain better understanding of the technology, having good management and good varieties, having the suitable production sites and contract market. 2) Most production should not limit only temperate lettuce and herbs but also some popular local crops sold at a reasonable prices. 3) The commercial hydroponic production to be successful, there are need to develop many necessary hydroponic equipments using local material for establishing the hydroponic farm. 4) There are the need to increase education and training at all level.

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Thesis Advisor's signature