

## HOW TO GET MORE FROM YOUR HYDROPONIC SPACE

This is a self-guided Distance Education course. It has been written as an accompaniment to the second edition of John Mason's book *Commercial Hydroponics*. Read the book, work through this course, and check your knowledge using the automated self-tests, practical tasks and optional assignment.

### Part 1.

#### CROPPING STRATEGIES IN HYDROPONICS

There are many alternative strategies that can be used in hydroponics. As a starting point, most growers decide what crops they wish to grow, then select a system suited to those crops. The main systems, NFT, rockwool and aggregate, are described in detail in chapters 5, 6 and 7 of *Commercial Hydroponics*.

Regardless of the system chosen, growers must tailor their cropping strategies to ensure market success. There are many variables that can help the grower to make the most of his or her system. For example, altering the feeding and watering regime, changing the crop spacing, modifying the plant support system, or perhaps using computer-automated equipment can significantly improve production.

An important aim of tailoring each operation is to use space more efficiently, and hence improve commercial viability. Some of the key factors in using hydroponic space efficiently are described in this course.



#### **Plant Spacing**

Plant spacing is determined by the crop species' growth habit. All plants will grow quickly and uniformly until available light energy is reduced. Spacing then plays an important function. The closer the spacing of flowers, the smaller the stem and blooms that are produced. Generally, more space is required between plants in winter than in summer because of less available light. The seed suppliers often offer a recommended spacing and the grower's experience will confirm this.

Chinese Cabbage

To reduce the potential of disease spread and foliage damage it is preferable that foliage of each plant does not touch. This is often difficult as crops mature, and pruning is often required to maintain space. Damaged foliage is open to invasion by unwanted pathogens.

#### **Intercropping**

Intercropping can mean growing two or more different plant species in the same greenhouse or hydroponic system or, more commonly, it has come to mean planting

young seedlings of the same species in a crop of mature plants, as is carried out with tomatoes. In this case, as the older crop starts to drop off in production and is nearing the end of its useful life, young seedlings are planted either side of the older plants and allowed to develop in the same growing media. As the older crop is removed, the younger plants have already established and begin to fruit, this reducing significantly any down time between one crop and the next.

Given that different plants have different growing requirements, it is often difficult to grow two different plants side by side, or in the same system in hydroponics. Tomatoes for example need a different nutrient mix for optimum fruit production to what lettuces need for producing a large tight leafy heart.



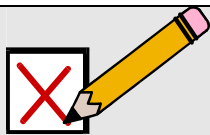
Cherry Tomatoes

Roses might grow and flower in the same hydroponic bed for years, but many vegetables only grow for months. If the vegetable grows amongst roses, perhaps removing the vegetable roots might disturb the rose roots. Questions such as this do need serious consideration if you plan to grow different crops together in the same hydroponic system.

## SET READING

Read the following chapters in *Commercial Hydroponics* before attempting Self-Assessment Test 1:

- Chapter 3, Alternatives
- Chapter 5, NFT Culture
- Chapter 6, Rockwool Culture
- Chapter 7, Aggregate Culture



### SELF ASSESSMENT

Perform the self-assessment test titled 'Test 1'.

If you find yourself getting the answers wrong, go over the notes from this lesson again and then repeat this test until your answers are correct.

## SPACE EFFICIENT SYSTEMS



### Trellis Systems

Due to the exceptional growing conditions within a greenhouse many plants and vines require assistance to grow to their potential. Crops such as tomatoes, cucumbers, melons, aubergine, capsicums, beans and snowpeas require strong support and the plants must be trained up to an overhead wire or other support system. This is achieved by tying the central stem as in the case of tomatoes or main leaders as in the case of capsicum up to an overhead wire using string, or string hooks which are designed for longer-term production of many crops such as tomatoes which may be layered over time.

Aubergine

### Hanging Gardens

An advantage of hydroponic systems in greenhouses is the ability to use overhead space. Hanging systems such as column culture and bag culture have been specifically designed to utilise overhead space. Hanging systems have been used commercially to grow trailing and climbing plants such as strawberries, zucchinis, cucumbers and climbing beans.



Climbing Bean 'Purple King'

### Tiered and Multi-layered Beds

Tiered and multi-layered beds are used in both outdoor and greenhouse operations. Multi-layered beds not only provide the advantages of raising plants off the ground (eg. less bending, better ventilation), they also allow many more plants to be grown in a specific area. Multi-layered systems are especially popular in greenhouses where space is limited and operating costs are high. A typical multi-layered bed is a tiered rack of PVC gullies in a NFT system.

## SET READING

Read the following chapters in *Commercial Hydroponics* before attempting Self-Assessment Test 2:

- Chapter 8, Other Techniques
- Chapter 12, Vegetable Crops



### **SELF ASSESSMENT**

Perform the self-assessment test titled 'Test 2'.

If you find yourself getting the answers wrong, go over the notes from this lesson again and then repeat this test until your answers are correct.