Growing Hydroponic Strawberries

Aims:

- To grow strawberries out of the reach of slugs
- To test IoT devices to monitor water lever, pH, maybe dissolved solids, oxygen, temp. etc.

Research

There is a lot of information on YouTube.

How to grow Strawberries in Hydroponics: https://www.youtube.com/watch?v=aJorITEWCWk

Frame Hydroponic System: https://youtu.be/EJjAWF2DfWY

From these and other videos I designed the system below:

The system incorporates:

- A series of tubes (drainpipes) to hold the plants
- A reservoir to hold the nutrient solution
- A pump to circulate the solution through the plant roots
- An air pump to oxygenate the water

It is also proposed to control the system using an Internet connected Raspberry Pi 3. The most important function of this would be to turn off the pump and send an alert in the event of a leak draining the system.

Equipment

My shopping list comprised the following items:

- Wickes: FloPlast D043 Underground Drainage Pipe - Terracota 3m x 2 £9.06 each
- Wickes: FloPlast D95 Drain Adaptor 6 435225 x 4 £6.44 each
- Wickes: FloPlast SP83G Soil Pipe Socket Clip - 110mm 158932 x 6 £1.48 each
- B&Q: 55L Trunk (tool chest with lid for reservoir) £12.00
- B&Q: Pipe Insulation (to hold the plants) £2.36
- B&Q: Duct Tape (to hold the drain adaptors in place) £8.20
- Homebase: Cistern Overflow Connector - 125mm x 2 £1.90 each
- All Pond Solutions: aquarium air pump kit 180 L/Hr £9.99
- Hozelock: Cascade fountain and waterfall pump 1500 L/hr £32.13

Already in stock:

- Power drill
- Hole saws (various sizes)
- Assorted bits of pipe and hose

Procedure

I first cut the drainage pipes to length to fit the side of the shed.

Using a 25mm? hole saw, I cut a hole in each pipe about 5 to 6cms from the ends of the pipe. The cistern overflow pipes could then be inserted and the back nuts tightened. These pipes will take the water down from the top pipe to the bottom pipe, and from the bottom pipe to the reservoir. The ends of these overflow pipes project about 4cms into the drainage pipe. When in use, this will maintain a nutrient solution level of around 4cms inside the pipe.

Once the overflow pipes had been inserted and tightened, the drain adaptors were pushed into the ends of the pipe to retain the nutrient solution. Duct Tape was then wrapped around the ends of the pipe to secure the drain adaptors in position and stop them pulling out.

The drainage pipes were then fixed to the shed using the soil pipe clips. A spirit level was used to make sure they were level. There is no need for a fall from one end of the pipe to the other in this system, as the pipes will be kept approximately half full of nutrient solution. At this stage, there are no openings for the strawberries. These will be cut last to make sure that they are cut into the top of the drainage pipes.

Appendix

Drain Adaptor

55L Trunk/Tool Chest

Cistern Overflow

Pipe insulation for 29mm (1 inch) pipe

Air pump


AllPondSolutions
AQUARIUM
AIR PUMP KIT
AP-3-KIT
3L per min
High output
Low noise operation
Dual outlet
Multi-speed control
Air Stone x 2
Non-return valve x 2
Air hose x 4m
CE

Water pump


HOZELOCK
CYPRIO
CASCADE
3 YEAR GUARANTEE
Fountain and Waterfall Pump
Attractive water features
Easy installation
Low maintenance
FOUNTAIN
+
WATERFALL
MAXIMUM FLOW
1500 (330 GALS) LPH
MEDIUM