



Creating a sustainable farm of the future for strawberry production



March 2014 was the start of an innovative new project - **The Sustainable Strawberry Project.**

Collaboration between M&S, Total WorldFresh and Cravo Equipment Ltd, created the opportunity to trial a technologically advanced new growing system within the UK. Led by Andy Mitchell from M&S, a team based at the Total World Fresh Kent trial site, was commissioned to construct and evaluate the potential of a Cravo automated retractable roof greenhouse. The aim of producing an improved quality, higher yielding crop, whilst creating a sustainable growing system, lies at the heart of the project.



To ascertain the best use of space and resources whilst producing, improved quality higher yielding fruit with as little input as possible, single, double and moveable double table top growing systems have been used to grow Sonata 60 day cropping strawberries.

The ability to control the internal humidity levels quickly, also facilitates the lowering of fungicide usage, especially relating to humidity triggered disease such as Powdery Mildew. Over a two year period the internal and external climate conditions are being monitored and compared to a comparative conventional tunnel grown crop. If disease and climatic stresses can be reduced, plant health, yield duration, quality and quantity increases should follow.

The Cravo retractable roof greenhouse is unusual in its design. The retractable roof and wall panels can open & close in approximately 4 minutes. The underlying principle hinges on when to close the walls and roof during adverse external conditions rather than when to ventilate to reduce adverse internal conditions, such as humidity and heat. Constructed from reinforced polyethylene, the roof and walls respond to a network of sensors, which relay data to a computerised control system. This allows the environment to be manipulated easily by opening and closing the roof and walls whenever required with the added bonuses of reducing labour costs & reliance on climate prediction models.





year one

Year one has proven to be an exciting beginning to a data rich venture.

Preliminary results display very encouraging progression. Crop yields produced 96% First class fruit and an increase of 22% overall, in comparison to tunnel production. High average Brix factors were recorded successively as the season advanced.

One of the most promising results, demonstrated so far, concerns the reduction of chemical fungicides and pesticides. Using the Cravo control system as a combative tool, facilitated an observation based attitude to disease control. Consequently this led to a 94% reduction in chemical applications and a 0% residue test result.

The ability to exploit both the natural outdoors and a protective greenhouse environment has allowed for a more proactive crop management and less dependence on prediction. This subsequently has led to increased climactic control and more effective crop management.

Greater effectiveness of insect control is also possible since the walls can be closed when the risk of insect migration into the house is high, helping to reduce insect populations inside the growing area. Although increased pest and disease monitoring is necessary, the cost incurred has been offset by the significant reduction in labour costs elsewhere.

The ability to rapidly change the light, temperature and humidity; enabled by the Cravo system, allows for utilization of the natural outdoors, providing an advantage over existing tunnel growing systems.

year two

Year two production will begin late February with the addition of three varieties of Ever-bearer strawberries:

Triumph, Arabella and Red Glory as an adjacent study, within the house. This will extend our data range, enhancing the possibilities of the Sustainable Strawberry Project and the Cravo house. Once the remaining Sonata crop has yielded its second year mature crop, it will then be replaced with a late planted, normally June bearing, 60 day cropping variety: Magnum, to illustrate yield duration possibilities.

Several substrate and soil improvement conditioner trials will also be undertaken, along with water reduction studies; using substrate additions: Arbuscular Mycorrhizal fungi, irrigation monitoring methods and re-circulation systems. These combined with further application reduction trials, in conjunction with predation monitoring, continue the search for a more sustainable production system, whilst maintaining plant health and enhancing yield quality, quantity and duration.