



The Oxford Farming Conference 2011

Chris Mack, Executive Chairman of Fresca Group Ltd

High-tech horticulture sets the tone for the future

Consumers prefer to buy British produce. Retailers prefer to sell British produce. Suppliers prefer to offer British produce. But when it comes to tomatoes, peppers and cucumbers, there's simply not enough British production to go round. More than 80% of all the tomatoes we consume as a nation are imported, yet with modern greenhouses we have the technology to produce consistently superb quality products – all year round if we want to. The issue is product affordability. These are commodity crops and we have to compete with the lowest cost in the marketplace. The latest technology in protected horticulture is there in part to make the growing process more efficient, but it's a significant investment and requires quite some commitment.

Allow me to introduce you to Thanet Earth. This is our company's response to the dwindling share of UK-produced salad vegetables. It's an investment in new greenhouses on the Kent coast near Margate which will ultimately add a further 15% to Britain's production of tomatoes, peppers and cucumbers. Thanet Earth is a joint venture business between my company, Fresca Group (best-known as a fresh produce importer and marketer) and our grower partners.

So far construction has been completed on three greenhouses which began production in February 2009, with a further 4 greenhouses to construct in the coming years.

The base concept at the heart of Thanet Earth is to use natural resources – light, water, land and agrichemicals – as efficiently as possible. We had to be extremely careful about the site we chose for this development. We needed sufficient land with big skies. When it comes to greenhouses, you can have all the technical wizardry you can find, but there's no substitute for natural light



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when it comes to productivity. The site in Thanet was perfect. Almost surrounded by sea, it has outstandingly high light levels. Already relatively flat, it offered us good road access and would place us within very easy reach of more than 5 million households. We had gas, water and electricity infrastructure close by. This area of Kent has suffered from underinvestment and high unemployment – a rate that reaches over 13% in some wards, and Thanet District Council were open-minded and supportive of our plans for the land and the hundreds of jobs we'd be creating.

£100 million. No matter how many times you say it, it's still an awful lot of money. It's costing about £100m to build Thanet Earth. That's not solely a Fresca Group investment – Thanet Earth is a joint venture so we share the load with our business partners, but it's a number that still makes the blood run cold. Add to that the high media profile the project attracted and the industry interest in our plans and, to put it bluntly, we were risking our company's reputation with this venture.

But somehow we've done it. At least, we've made it this far, travelling on a learning curve that felt practically vertical at times. The thing with a new site, new greenhouses, new technology, new people, new environmental innovations etc, is that there's an awful lot of 'newness' in there. You're learning as you go, and you have to have faith that the groundwork you've put in and the determination of all involved will get you through.

Thanet Earth serves the big retailers in the UK. They don't suffer fools gladly and the stakes are high. They demand quality products and tailored service, and with an eye on climate change and social responsibility, they're looking increasingly to their suppliers to demonstrate that sustainable food production is at the core of their operations. And they expected us to be cheap! We had to ensure that Thanet Earth was created around a technical model which gave us the magic fusion of quality products, competitive prices and sustainability.



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This wasn't a difficult decision because, as became clear early on, the most environmentally-friendly growing model just happened to be the most cost-efficient. It was a win-win situation.

We looked east, to Holland for our growing expertise. The Dutch have honed efficiency to a fine art when it comes to growing their greenhouse crops. They've invested many millions in research and development trials to continually improve technology and systems. Whilst you clearly can't control external influencing factors such as weather and global markets which can have a major influence on your operations, the Dutch approach is to take those elements of greenhouse growing that you can control and make them work in your favour. And to do it on a very big scale. If our growers could control the conditions within the greenhouses to such an extent that they could practically guarantee the quality and volumes of crop they produced then this would be a great start. Our technology allows them to do this. We manipulate the plant's conditions to give it absolutely everything it needs in order to get it to produce exactly what we need in return. Contrary to some public misconception about our methods of growing, the flavour is still superb – that's the art of a good grower.

I've touched on our sustainability and our carbon footprint is something we've looked at in detail. Clearly we have to heat our greenhouses somehow. And with so many plants trying to respire in one building, we need a lot more carbon dioxide than exists naturally within the atmosphere. To put it frankly, the high cost of energy now makes it impossible to produce these crops if you have to pay for your source fuel. You either need to be heating yourself with someone else's waste heat or you need a further revenue stream. We opted for CHP. Combined Heat and Power. Using this system, Thanet Earth is a power station. We operate large gas powered engines within each greenhouse building, generating electricity, some of which we use ourselves but which primarily we sell to the National Grid. The waste heat and carbon



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dioxide are captured and put into the greenhouse to help us grow our crops. That means that we make much more efficient use of the gas source fuel than even the most efficient conventional gas power station. Our research shows that those conventional gas power stations make use of a maximum of around 45% of the energy potential of the gas whereas our CHP system and our utilisation of the waste products from the electricity generation process means that we are making efficient use of over 80% of the energy potential of our source gas. Under the government's PAS2050 standards, this contributes a negative carbon emission towards our measured carbon footprint and brings our ultimate goal for Thanet Earth to contribute an overall negative carbon footprint one day a step closer to reality.

We're reducing our environmental impact in other ways too. Some 50% of the water we need is harvested from the glasshouse roofs. There are even gutters on the inside of the glass to capture condensation. We run a closed loop watering system whereby any water not absorbed by the plants is collected and reused the next day. This cuts our fertiliser requirements by around 25% as we recycle the nutrients contained in that water. It also reduces our overall need for water – such a precious, limited resource. We barely have to touch mains supplies, having built enough storage capacity for 70 million gallons of water – that's enough to see us self-sufficient through the summer months.

Inside the greenhouses, we're applying the very latest in technical innovations. It turns out there's a lot more to growing tomatoes than you'd have thought. Our tomato greenhouse is not just impressive for its size (although frequent flyers will note that the footprint of the T5 building would fit comfortably inside it). This greenhouse is 8.1 metres tall. Our tomato grower benefits from the ability to create eight different environmental zones. This means we can produce two crops of up to ten different varieties of tomatoes simultaneously, giving each one its perfect amount of heat, light, humidity and



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feed. Data from the crop and the atmospheric monitoring within the greenhouse is captured hour by hour, with many of the cleverest technological elements such as the artificial lighting, the liquid feed transport system, humidity control, the thermal screens and the carbon dioxide introduction adjusted when certain set parameters are reached.

Notwithstanding the amount of wizardry that we use to finetune the environment in the greenhouse, things are kept as natural as possible, using a busy community of bees to pollinate the flowers. We also use natural methods of pest control whereby beneficial insects are placed among the plants to deal with the ever present threat of the not so beneficial creatures, like aphids. Tomato production is on a seamless 52-week basis at Thanet Earth, made possible by interplanting – we place young plants in between the older plants at crucial points during the year to help us bridge the seasonal gap with vigorous young fruiting plants as the previous season's plants begin to wane.

So where next for Thanet Earth? We believe that we have possibly the greenest greenhouses in the country at the moment, but we know that there's still more we can do. We have a further four greenhouse sites to develop at Thanet Earth and we have some interesting decisions to take. Aside from what additional crops we should grow in them, increasing our sustainability is a key challenge. We have invested over £6m in an electrical substation that allows us to upload our power to the National Grid, but that power doesn't necessarily have to be generated by using gas. We are considering greener alternatives – energy from waste, biofuels, sun and wind, for example, although a number of factors have limited the viability of these options for this site until now. We remain optimistic and open to the possibilities that suit our operations.



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Aside from this, we're working with our Dutch partners on further innovations in our field, including research into varietal development and into ways to increase yield without compromising on flavour. We're also looking at lighting, with the intention to switch our energy-hungry lights in the tomato greenhouse over to new LED growlights which would dramatically reduce our energy requirement and carbon footprint, and we're working on ways to use technology such as weather assessment equipment to help us reduce our water use yet further.

The key to all of this is, however, investment. None of this comes cheap to create. Ultimately everything we've created at Thanet Earth brings efficiencies in the way we operate, but this is no small beer. We remain at the mercy of a global commodity market and of a weak pound which pushes up some of our key input costs and much of our funding given that the lion's share of the investment support came from a Dutch bank. We wish for good summers to bring high consumer demand, and we hope that the skies of Thanet continue to bring us the all-important high levels of natural light.

The UK can sustain much more production of these salad crops than is currently grown, even with a big new entrant to the market like Thanet Earth. The biggest barriers to industry growth in my mind are probably finding suitable sites, ambition and investment. It's a brave business that takes on this kind of project. And to try it on a lesser scale is probably not economically viable. British banks need to gain a better understanding of the industry and growers have a big job to do to trigger further investment in the field, particularly given the current financial climate. It is possible, and it is possible to do it sustainably, but for anyone thinking of doing so, I'd recommend starting with some very experienced partners, a very friendly bank manager and perhaps a giant bottle of whisky.

Chris Mack