# Appendix

## Outlook for the Dutch flower industry in the coming decade

**Out of every ten flowers that cross a national border somewhere in the world, 7 originated in the Netherlands – a very impressive market share. The next largest exporter of flowers in the world is Colombia, with less than 1 in 10 flowers (0.7 to be precise).**

**In 2004 the Netherlands produced EUR 4.7 billion worth of ornamentals, and exported ornamentals worth EUR 5.9 billion. The imports are typically sold at the auctions, then repacked and exported again. That illustrates two well developed competencies of the Dutch people – their meticulous care of a huge production on every square centimetre of valuable soil, and the high degree of competence they have developed in trade. The Dutch have been practicing trade since the sixteenth century. But, as anyone in the Netherlands will hurry to say, successes of the past are no guarantee for the future.**

### Role of the Dutch auction system

**Looking at the past, it is obvious that the invention of the auction system as a market-place owned by the growers of fresh produce allowed for this enormous development in the market for ornamentals. The rise of hothouse production goes on the account of a strong drive for innovative agricultural and horti-cultural growing techniques.**

**In the fruit and vegetable business a similar system of auctions existed all through the twentieth century, but it collapsed as the outlets merged into fewer and fewer retail chains. In the ornamental sector the same change is under way, but not at the same rate. It is slower, and many Dutch growers refuse to acknowledge that there is such a trend at all.**

### Changes in Dutch hothouse economy

**Nonetheless, these developments are indicative of the ongoing changes, most notably of scale enhancement. Hothouses smaller than 2 hectares in area have been disappearing, and the number of those larger than 5 hectares has increased in the last 5 years (LEI data). So the number of companies is diminishing, while total production is rising. At the same time the competitors from countries close to the equator, such as Kenya, Uganda, Ecuador and Mexico, are growing stronger. Their labor is cheap and they can produce at about 2000 m above sea level the entire year round with no essential seasonal climate change or significant technical investments.**

**The Dutch flower industry is holding on to its competitive edge with the development of new, mechanised growing and harvesting techniques that allow for year-round production at minimal labor costs, while maintaining very high quality standards. At latitude of 52°, it is necessary to have heating in the hothouses for at least half of the year. With the enormous rise in the cost of energy, including the natural gas they use, it is mandatory to reduce the energy input in hothouse production. At the moment, experiments are running that use an under-ground aquifer to store excess heat in the summer and use that heat in the winter. At present, this method brings a 30% reduction in energy use with a 20% increase in production.**

**However, ideas to improve the system so that it can produce excess energy (dubbed "the Energy Producing Greenhouse") are also under development. At the same time, walking plant systems are being developed, which rotate plants through the hothouse, taking them through segregated compartments where different climactic conditions prevail.**

**Computer vision programs coupled to camera systems decide which treatment the plants should get in order to deliver the right plants at the right moment. This saves expensive hothouse space, since there is no more need for paths between the plants for people to move through for visual inspection. The plants are brought to the people**

**for harvesting and treatments instead. This saves labor and allows for the coming use of harvesting robots, so that in future, labor costs will be cut to an absolute minimum.**

**In answer to environmental restraints the government places on production, all resources are used in closed loops and wherever possible recycled. In fully closed hothouses with minimum human intervention, no airborne pests can enter and agro-chemicals will no longer be used.**

**The financing of enterprises such as envisaged here is a great obstacle as they become more and more capital intensive. It is becoming impossible to do this on a small scale, the consequence of which is that investments go to larger and larger companies. At the same time the growers of fresh produce see their opportunities in a forward movement into the supply chain. This implies that they also try to create more and more added value, eliminating the middle man between them and the final outlet servicing the consumer, cutting costs as well.**

**From this image we can conclude that the future Dutch ornamental producing company will be very large scale, producing year-round high quality material in direct demand of the retail outlet. It will do this with a minimum of labor input and extremely high resource efficiency in an environmentally friendly way. These companies will be financed and run like any modern industry. Once the development is saturated on the level of resource and labor efficiency, the companies will eventually leave the Netherlands or at least position themselves in locations where the other conditions for production and trade are optimal. This process may take 10 to 15 years or more.**

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