



# Big business in miniature roses

CRAFT BRST-CT97-5109

European SMEs cultivate hundreds of millions of pot roses every year – but they need to modernise to fight global competition

Propagating roses by manually taking and planting cuttings is a laborious process that adversely affects the cost and quality of miniature or pot roses. A consortium of SMEs from three EU countries used a CRAFT project to automate the process, so reducing production costs and improving product quality. The prototype machinery they developed – a camera-guided robotic system – can cut and plant over 3,000 rose cuttings per hour. The partners have now formed a new SME, Rombomatic BV, to exploit their achievements. They will manufacture the new system and market it to nurseries – not only for roses but also for any other pot plant that can be propagated by taking cuttings.

“What’s in a name? That which we call a rose, by any other name would smell as sweet,” wrote William Shakespeare in *Romeo and Juliet*. Symbol of love, roses have been admired since ancient times for their beauty and sweet scent. That’s why they are big business for the many European SMEs that cultivate hundreds of millions of these blooms each year.

In rose-growing, small is beautiful. Like bonsai trees, the flowers, leaves and stems of miniature roses – dubbed ‘minis’ – are all tiny and perfectly to scale. They come in a vast range of shapes, colours and sizes and are enjoyed first as an indoor pot plant before being planted out in the garden. Roses are propagated not only sexually, from seed but also vegetatively, by planting a cutting from the parent rose to grow a whole new plant. This method is widely used in horticulture as it allows the mass production of plants with desirable traits. It has the added advantage that a saleable plant is obtained much more quickly than would be possible from seed and with exactly the same traits as the parent plant.

## Under growing pressure

In common with other industries, even the specialised market for pot plants is becoming global. Competition is on the increase, as Europe’s pot rose nurseries, many of which are SMEs, come under growing pressure from low wage economies. To survive, they must improve productivity. That spurred Bert Rombouts, who grows roses in

Hapert, in the Netherlands, to initiate a CRAFT project to develop an automated system for taking and planting rose cuttings. It had twin aims: to improve quality and to reduce production costs for pot roses.

Mr Rombouts joined forces with three other pot rose nursery owners – Ove Nielsen from Denmark, Franz Koster from Germany and Ton Groot, also from the Netherlands. Their combined output is in the tens of millions of pot roses a year, and every single one is grown from cuttings taken and planted by hand. As they had limited experience of research project management or the CRAFT programme, they called in Uniresearch, a Dutch consultancy based in Delft which specialises in facilitating international R&D projects, to co-ordinate the project, as Dr Jaap Struijk, project manager at Uniresearch, explains.

The group first approached an advanced mechanical engineering research centre, CCM, but later on they made a partnership with three Dutch SMEs: the machine building companies Te Strake (who became a partner) and Jentjens MachineTechniek (a subcontractor) who developed and built the robotic system, and ARIS (Advanced Recognition and Identification Systems) who worked on the image processing side.

## Automating the system

Most of the pot rose producers are already highly automated. Transporting the plant pots inside the greenhouses, filling them with potting mixture, pruning the roses – all these processes are computer-controlled. But the cutting and planting process is not. The sequence of taking a cutting – choosing a healthy rose shoot, trimming it above a bud and then below to remove a small





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*Picky robot: the CRAFT project has developed a robot – called the Rombomatic – that accurately recognises, selects, trims and plants 3,000 rose cuttings per hour*



section of stem, and planting it in a pot – is all done manually. Mr Rombouts had the idea of using a robot to do this laborious and monotonous work.

The final team that designed and developed the automated system comprised six partners from three EU countries. Their collaboration has produced the first prototype of an automated rose cutting and planting machine. It has three components: a branch transport unit, a number of cutting and sticking modules and a pot transport unit. Its robotic arms are guided by cameras using image-processing software. These arms select a suitable rose shoot, cut it to the right length and in the right place, and then plant it correctly in a pot. The pots are then transported to the greenhouse where the cutting grows into a new plant.

The problem of handling and manipulating flexible rose-cuttings at high speed and with precision using an automated system was very technically challenging. "It was not just the robotics that had to be engineered," Mr Rombout stresses. "The software that recognises the rose branches and identifies the right spots for cutting had to be developed using artificial intelligence – which means that it learns by doing."

### Future looks rosy

The new system is capable of cutting and planting over 3,000 rose cuttings per hour, allowing its two operators to almost double their productivity. And apart from speed, the machine has the advantage over manual cutting of producing very uniform plants. Now the project has finished the team has continued collaborating to produce a commercial prototype. Two machines were produced in 2001 and installed at Mr Rombout's nursery in Hapert, the Netherlands and at Mr Nielsen's in Broby, Denmark. A further four new machines followed early in 2002, and the machine is scheduled to be launched onto the market in autumn 2002.

To capitalise on their success the partners have set up a new SME, Rombomatic, to manufacture and market the system.

Project partner Te Strake, which is experienced in mechatronics, will handle the sales, production and servicing of the robot systems. The new company estimates world demand in the pot rose industry alone at 30 or so units a year. But there are many other pot plant varieties, and countless nurseries worldwide where the new system could also be applied. The future for the system is definitely looking rosy.

#### Full Title:

The development of an automated system for the cutting and planting of rose cuttings

#### Industrial Sector:

NACE 01 Agriculture, hunting and related service activities

#### Supporting Technologies:

0011 Agricultural Engineering/Technology; 0054 Automation, Robotics Control Systems

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- Nolina Potplantenkwekerij B.V. (NL)
- Te Strake B.V. (NL)

#### RTD Performers:

- CCM – Centrum voor Constructie en Mechatronica (NL)
- ARIS – Advanced Recognition and Identification Systems (NL)

#### Duration:

05/97 – 08/99

#### References:

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#### Programme:

BRITE-EURAM III

#### Project Cost:

€1,000,000

#### Range of SME Contribution:

€50,000 – €150,000

#### EC Funding:

€500,000

