Mexico capitalises o

Production in Mexico is modernising at a fast rate. In the last four years the area covered by greenhouses has tripled. The forward-looking companies are investing in high tech equipment for year round production in order to supply the lucrative North American market. Gerard Boonekamp, journalist for 'Groenten en Fruit', visited the country's most important production areas.

Vegetables produced in greenhouses are in high demand on the North American market.

Driven by demand from the North American market, vegetable production in Mexico is rapidly changing. Producers are switching from growing outside in soil to greenhouses in substrates. Since 1997 the area of land covered by greenhouses has leaped from 300 ha to about 1000 ha. But it is not just the former outdoor growers who are investing in greenhouses. Many new projects have been established with capital from North America or by investment companies in Mexico with previously no experience in the vegetable market. Also driving the growth are incentives offered by some federal states for companies to establish large-scale greenhouse as development projects in poor areas.

Characteristic of Mexican production is the large number of greenhouse types being used. The Israeli constructions arrived first followed by the Canadians, Spanish and French multi-tunnel houses. A disadvantage of the Israeli greenhouses was price and climate control was difficult. The Canadian houses suffered the same problem but were half the price. Now, the first choice for most growers situated in the higher regions is the Richel-type multi-tunnel greenhouse with a double plastic roof which costs about €27 per m^2. Glasshouses cost about double and cover just 40 ha although this is still more than in Spain, for example, where the total area covered in greenhouses is 40 times greater.

The price advantage for vegetables grown in greenhouse on substrates compared with soil production is what makes the heavy investment in greenhouses feasible. In the US, consumers demand high quality and prefer the greenhouse-hydroponic grown products for which they are willing to pay two or three times more for than open field products. The consumers perceive greenhouse crops to be safer and better for the environment. At the moment

Cheap labour is an important advantage for Mexican vegetable growers.

In many greenhouses, the wire is still tapped for the purpose of pollination.

n American market

Domestic consumption is becoming ever more attractive for producers. Except for during the winter season, prices are better within Mexico than on the North American market. The wholesale market in Mexico City is the hub of the domestic market. It covers 328 ha and each day handles the vegetables for Mexico's 22 million consumers. Some 70,000 people work here and many have to transport the produce on the 18,000 trolleys which are used at the market.

only about 18% of tomatoes eaten in the USA are produced in greenhouses so the market is still very open, which makes the investment in Mexico, where labour and climate are also attractive, worthwhile.

In the high altitude region in North West Mexico, year round production is just about possible in greenhouses due to the favourable summer climate. And, a few companies also try and produce and export the very best quality all year round. However, the majority of growers are using a lower level of technology which still enables them to supply the North American market in winter and the domestic market in summer. Such a company is Agricola San Miguel on an 11 ha site in Guadalajara. The company produces beef tomatoes year-round, with two production cycles which yield 20 and 14 kg/m² respectively.

It heats the greenhouse when the temperature gets below 8˚C and total costs, according to director, Eulalio Fonseca, are €22.69/m² of which €9.08 are direct production costs. The cost price works out at €0.71 per kilo. During the winter, the price achieved for these tomatoes on the US market averages €1.63 per kilo but during the summer this will be about half as the tomatoes are sold on the Mexican market.

Taking a look in some of the greenhouses, it appears that many companies could easily lower their cost price further: A few simple adjustments could significantly increase production. This means that, in the future, the Mexican growers can be expected to become ever more competitive.

Production technique - Cultivation techniques are in general at a reasonable level. Tomatoes are cultivated on high wires and are nicely pinched-out, wired and let down and capsicums are also individually tied and topped. A few companies register the crop on a weekly basis, measuring the amount of growth, length of leaf and how many fruits have been set.

Scouting by counting the number of pests on sticky boards is fairly routine. However, most companies still employ blanket use of chemical products to overcome the enormous threat from viruses. Biological protection is used on at least 30 ha of capsicums and by a few high-tech companies. But, tomato growers hardly use wasps as a method to control pests because application needs to be frequent which is very costly.

It is expected, however, that the technical demands on companies which export will rise substantially in the near future. American buyers want quality. The specification of "greenhouse" and "substrates" is highly valued on the North American market and receives a much higher price than vegetables grown in soil. However, US competitors complain that much of the Mexcian product which is grown in soil is labelled as greenhouse product. Therefore, in the future, purchasers will be more critical of production methods and will demand all sorts of certification.

Outdoor production - The valley of Culiacan in the state of Sinaloa is one of the most important centres for vegetable production. Here the favourable climate and cheap labour are the most important aspects. The area is defined by immense rows of poles and the first impression is that there is little difference between outdoor production of tomatoes here or, for example, in Spain. But looks can be deceptive. Tomato production, the most important crop in this area, is technically at a high level. Agricola Canelos is one of the family companies which has specialised in horticulture for generations. On its 3000 ha farm, 500 ha is dedicated to tomato production, 150 ha to cucumbers and 100 ha to capsicums. The rest is maize. Besides this the company has 110 ha of plastic covered greenhouses

for all three vegetables. Another nearby company is Agricola Paredes which has about 1000 ha of tomatoes, 95ha of capsicums and 90 ha of aubergines.

Rows of tomato plants are neatly tied.

Intensive cultivation - Most companies use the same varieties and same planting density inside as out. Hybrid seed is expensive yet it also provides some certainty. The most used variety for beef tomatoes is Gironda from Enza which Canelos is also using. In the field between the poles, every plant is nicely tied with a double piece of raffia string. When the prices are good and the company wants to extend the cultivation period, the string is untied and the plant is allowed to sag. However, if the prices are poor this labour intensive work is not worth the effort.
Agricola Paredes make less work from binding the tomatoes. Along the rows, on both sides a few strings are pulled along and attached to the poles.
However, the company is particularly keen on the control of growth via the moisture in the ground. After a large dose of water at the start of the plant's growth, the tomato plants are left dry for a couple of weeks in order to reach the correct EC. In order to get oxygen to the roots Canelos ensures that the soil is regularly loosened and this has to be done manually. Besides pinching out and turning in, the clusters are pruned to four fruits. This means that the tomatoes will be large when harvested which is ideal for the US market.
Due to this sort of cultivation practises, the work load is enormous. During the season, some 12,000 people work for Canelos alone and each worker earns about €9 per day.

Vulnerable - The growing season in Culiacun begins at the end of August and continues until the end of April, according to the price and the pressure from pests. Tomato production is between 7 and 9 kg /m^2 at Agricola Paredes and at Canelos the export quality fruit yields about 8 kg/m^2 and that for the domestic market about 6 kg/m^2.
The outdoor production is vulnerable. This season production is expected to be 40% less due to storms and rain. In addition, pests and diseases can also cause problems. Last year, Agricola Paredes lost all its plum tomato crop to Fusarium. And, Canelos finds Rhizoctonia is a big problem when there is a lot of rain. The most troublesome pests are white fly, thrips and leaf miner. And in order to combat nematodes it follows a rotation scheme of tomato, cucumber, capsicum and maize.
Canelos controls pests and disease with chemical applications although already there is a lot of talk about controlling its use. Usually each row is sprayed using a double spray boom although if it rains a lot a light aircraft will be used to spray against fungi. Agricola Paredes also uses pheromone cards to protect the tomato and cucumber crops against certain pests and aubergines are planted around the edge of the cultivation area, also, to act as a trap.

Social factors - Usually there is sufficient rainfall in the mountains to supply the valley, and the industry, with enough water for 18 months. And this

In the Agros packing station, tomatoes are selected by hand. Each is cleaned and polished with gloves and placed in the different packing. The people working here each pack about 80kg per hour and despite a relative good wage, this is still cheaper than in for example, USA where the packing is mechanised.

Gradual improvements

Agros, SA, on 11 ha less than an hour's drive from Queretaro, is part of a bigger agricultural concern. It has chosen for a high level of technology along with a realistic production and marketing strategy.
Agros was one of the first vegetable companies to switch to substrate cultivation in greenhouses, in 1992 when the North American Free Trade Agreement was formalised. The aim was to capitalise on the US and Canadian market.
It started with an Israeli constructed plastic greenhouse of one hectare and each year has expanded and improved. The goal has been to improve quality, extend the production season and decrease cost price. The result has been that since 1995, turnover per worker has risen eight fold.
The company is divided into ten departments of which 5ha is under plastic and 6ha is under glass which have been constructed by the companies, Dalsum and Dace. Everything is provided for: Hot water heating pipes; automatic watering; climate control and CO_2 dosing. This year another hectare of glass greenhouse is due to be built. Director Mario Steta does not need any further persuasion about the benefit of glass.
"There is little maintenance, the climate is easier to control and the temperature stays more even," he says.
The main worry is the threat of pests, fungi and viruses. Last year, insect gauze was fitted to all the ventilation windows but still the cicaden were able to introduce a new virus which ultimately meant that 5,000 plants had to be destroyed

water is essential because the ground water is very brackish and without heavy treatment it is not suitable for vegetable production.
However, water is a very political factor because the authorities issue water rights which naturally has a very strong influence on the development of the vegetable industry. However, this is actually encouraging its growth because, vegetable growers use drip irrigation systems and thereby use much less water than, for example, the sugar cane growers. And they put more back into the economy and provide employment.

Recruitment - Most companies in Caliacan use labour from the country's poor south. Canelos sends a doctor and two other employees to recruit workers who will then be brought back with their families to special villages. Canelos has built a school for the children and parents receive a food parcel for each child.
However, although all companies will meet minimum requirements, their provisions for labour will be different. Also, sending back the families when the season is over is starting to be seen as undesirable. The North American consumer is becoming more conscience of production methods. This means that export of outdoor grown crops are becoming vulnerable on a point which is currently its advantage: Labour. □

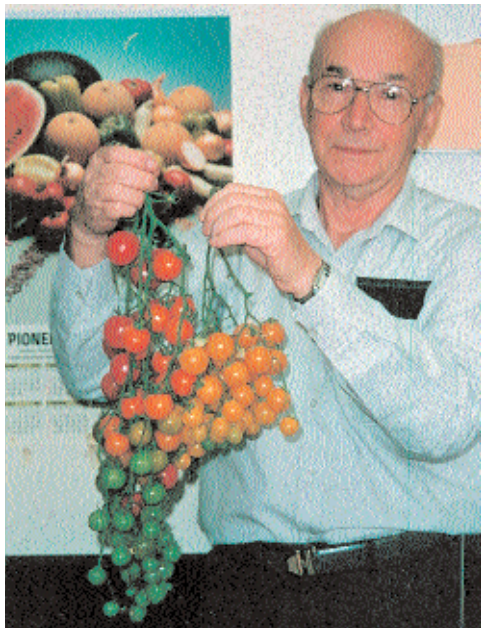
Agros on an 11ha site was one of the first companies in Mexico to switch to substrate production.

last October. Despite this, production manager, Bruno expects production this year to reach 57 kilo/m² of beef tomatoes of which 90% will be export quality.

Israeli breeders take Sinola by storm

The Department of Field Crops and Genetics at the Hebrew University of Jerusalem's Faculty of Agriculture in Rehovot, Israel, has gained the status as one of the world's major centres for breeding and developing new varieties of tomatoes.

By Aaron Priel



Prof Nachum Kedar.

Under the leadership of Professors Nachum Kedar and Haim D. Rabinovitch, teams of scientists started some four decades ago to breed new tomato varieties for longer shelf life, for better taste and more intensified colour, for high yields and to contain disease resistance properties.
Now nearly 50% of all tomatoes grown in Turkey for export are from Israeli seeds and nearly 80% of all tomatoes grown in Morocco are Israeli developed varieties.
The latest development has been to turn the Sinaloa region in Mexico into a major supplier of high quality tomatoes to the USA, making it the world's most developed open-field tomato cultivation region, according to Dr. Fabi Vidavsky. As a geneticist at the Department, he is credited for breeding "R 440" and "R 449", two new tomato varieties, with fruits weighing an average of 300 grams, that are especially suited for the North American market "and for the American taste."
The development of the Sinaloa region as Mexico's major tomato cultivation region is the result of the initiative taken by LSL, a joint American-Israeli company. Dr. Vidavsky said that the American partner, based in California, sought to introduce new disease-resistant long shelf-life varieties of tomato. When the new varieties were proven suitable for this purpose, part of the cultivation infrastructure was moved from Florida and California to Mexico. The reasons for transfering to Mexico included low production costs, compared with the costs in the U.S.A.
"LSL is responsible for marketing the Israeli-developed seeds, which are grown in Israel by nominated growers for cultivation in Sinaloa.
"Aside from being resistant to some diseases, these varieties attain a record yield of 80 tonnes per acre, twice the average yield of tomatoes in Mexico," Dr. Vidavsky noted.
He added that the varieties grown in Sinaloa "are tailor-made to the climatic conditions prevailing in that region. The unique disease-resistance properties of the tomatoes make it possible to grow these varieties without using methyl bromide." □