

## STSM REPORT

Short Term Scientific Mission code: COST-STSM-863-03839

Action number: COST 863 (Euroberry Research: from Genomics to Sustainable Production)

Applicant: **Franco Capocasa – Università Politecnica delle Marche – SAPROV**

Host: Els Desmet – Research Center Hoogstraten

Period: From start date 16/07/2008 to end date 11/07/2008

### Objective of STSM:

The aim of this STSM was to improve the knowledge on the programs now active on strawberry breeding, variety evaluation, nursery production, the different cultivation systems and the marketing of strawberries in Belgium. The emphasis of the STSM is to learn more about the different cultivation systems in Belgium.

### A) Strawberry production systems:

- 1) The activities carried out at the Proefcentrum di Meerle (Fig. 1) were related to the knowledge of the different production systems, variety evaluation, cultural techniques and water management now under study by the different research programs. Laboratories practices on the different type of analyses (sugars, firmness, color, etc.) generally carried out to test the quality of fresh or stored fruit were also carried out.



Fig 1. Example of different production systems now available in the Hoogstraten research center.

In particular the work carried out at the research station (Fig 2) included the collection of data related to the effect of different water management system and nutrition program (pH of the nutritional solutions) on vegetative plant development and fruit quality. At these conditions have been tested different strawberry selections including also the evaluation of the different pomological characters. Some everbearing genotypes were included in the evaluation and their flowering behaviour was studied by monitoring weekly the number of inflorescences and number flower per inflorescences .



Fig. 2. Different laboratories activities carried out in Hoogstraten laboratories.

- 2) Field visit at different type of strawberry farms. The reality of the different production systems now used in that important strawberry area was known also by visiting several strawberry farms: 15 farms in Belgium, 2 in Netherlands and 2 in Germany. These visits occurred with the assistance of different advisers operating in collaboration with

Proefcentrum. In particular, farms using the following different cultivation and water management systems were visited:

- Green house - with soilless cultivations
- Plastic house – with in soil or soil less cultivations
- Open field – with soil-less with small tunnel protection or without protection.

The Hoogstraten centre is offering a service of technical assistance to about 200 growers located in Belgium, Netherlands and Germany, this with the help of 4 advisers that every day offer an assistance to the growers on the planning of filed plantations, phytochemical treatments, fertirrigation, etc. Of particular interest were the visits, with the support of Dirk Vermeiren, to growers located also in Belgium, The Netherlands and Germany, so to compare the techniques used in the different countries.

In Germany, most the growers are of larger dimension (the few visited were over 30 ha), the cultivation system most used is in soil, protected or in open field, and mostly based on shortdays cultivars, already finished at that time, but with the production of the production from everbearing varieties such as Albion and Evie 2. On the contrary, the Belgian farms were characterized by small farms (no more then 2 ha), mostly in green house and soilless production systems, and a small part also in soil. A similar situation was observed in the farms visited in the Netherlands.

Of interest was also the visit to a farm located near to Hoogstraten which was also equipped of two different systems of co-generation used for the production of electric energy as necessary for the management of 8,3 hectares of glasshouses mostly used for tomato cultivation.

This type of farm can be considered as an interesting model for having new production systems with reduced energetic costs with the utilization of innovative technologies for greenhouses heater.

## **B) Breeding programs and Nursery productions**

During the STSM, a specific program of visits was organized to see the activities of different public and private companies now actives on breeding programs and nursery production. Following a short description of the main companies visited during this period:

- 1) Vissers Nursery (NL) (Els Desmet). During this visit the company leader Hans Obers illustrated the different activities related to production and commercialization of strawberry, raspberry varieties. The company is equipped with different Greenhouse (screenhouse system, sterilized soil, etc.) all used for the plant propagation in different periods and with high health quality control. This company is also active in strawberry breeding program and recently has been released a new strawberry variety “Elianny” of interest because with high similarity with “Elsanta” but with lower flowers per inflorescences so allowing higher fruit size. Among the different varieties they are commercializing also some Italian varieties such us “Alba” (New Fruit – Cesena IT), a short day variety mostly addressed to the cultivations located in south Germany. Among the 30 cultivars now commercialized, other major cultivars commercialized by the nursery are: Kimberly (NL), Cassandra (GB), Malling Pearl (GB), Elsanta, Albion. Furthermore, for the breeding program the company is evaluating about 50.000 seedlings per year. Finally, of interest was also the explanation of the certification system adopted by the company with the collaboration of the Naktuibouw (NL) centre sanitary certification, also visited, in charge to produce virus free mother plants.
- 2) ABZ Seed Nursery. The director of this centre Ir. Gè C. M. Bentvelsen has explained the history of the company, started in 1995, and the method used for strawberry propagation not based on runners but on seeds able to produce F1 uniform progenies. The reason because this company decided to use this alternative-unique method for strawberry propagation were the following:
  - a) propagation by seed reduces the transmission of virus diseases;

b) production costs are much more less in comparison with costs of the plants propagated with traditional methods (fresh plants, try plants, WB, TP, Frigo ecc).

Also this company is running a breeding program including the evaluation of about 50000 seedlings per year. The breeding program is addressed to the following objectives: production of new varieties for growers having compact plants, highly productive and high quality; new varieties for hobbistic market with more vigorous plants, high flavour and resistances); ornamental plants with flowers of different colors (pink, yellow, etc.) and fruit of very high flavour. ABZ Seed resulted a company of particular interest because of the alternative method for strawberry propagation, by seed, with reduced costs and with high health guarantee. The only limiting factor is the uniformity of the plant material obtained by the progenies.

- 3) Oprins Nursery. Oprins nursery is another company specialized since different years on in vitro propagation of Bamboo plants. The decision to visit also this company was related to the fact that it is located in the area of the other companies and also of the peculiarity of their product. With the director of the company were visited the laboratory facilities and greenhouses used for the propagation of this plant. The director also described the method used for the propagation of about 1,5 millions of plants then commercialized in pots (15 cm).
- 4) Fresh Forward (NL). The responsible of the breeding program of the company (E. J. Meulenbroek) illustrated the main objectives of their strawberry breeding program addressed to the production of new Junebearing, Everbearing cultivars adapted for the cultivation in the Spanish cultivation system. This last objective is now considered important and it is organized by performing a first selection of the seedlings in The Netherlands on soilless cultivation systems and then the most interesting selections are transferred to in Spain for a final evaluation in their cultivation systems. For the breeding program are evaluated about 50-60.000 seedlings per year, and all the evaluations on seedlings and selections are carried out in open fields settled in private farms. With the responsible of the evaluation were discussed the different methods of evaluation and selections. Among the different varieties released by Fresh Forward, the last more important are Figaro and Sonata. These varieties released for the cultivation in Belgium and The Netherlands have to reach at least the standards of the still most diffused Elsanta and possibly with increased productivity and/or quality.
- 5) Visit to field trials of Landwirtschaftskammer Nordrhein Westfalen (Germany) and meeting with Ludger Linnermannstons. This visit was focused to verify the research work developed for the berry varieties evaluation, mostly of everbearing strawberry varieties, following the cultivation techniques (open filed, tunnel and soilless) mostly used in Germany. Among the material included in the trial, the most interesting results were observed for the following strawberry selections: Florin, Charlotte, Everest, Rubigens (Australia), 3 CIV selections, and 1 selection from the University of California.
- 6) Visit to PC Fruit – Tongeren (BE) and meeting with Patrick Meesters and Sven Clemens. This research station is running one of the more important program on berry evaluation: strawberry, blackberry, raspberry, blueberry, Ribes ecc. Among the different strawberry genotypes under evaluation in this conditions of particular interest were the results achieved from some Italian varieties, such as Adria and Sveva, and 2 selections such as AN99,78,51 and AN01,211,51, all obtained by the breeding program started by SAPROV at Marche Polytechnic University. Differences on cultivation techniques and varietal responses between western and northern cultivation areas in Belgium were discussed.
- 7) Visit to PC Fruit di Kerkom (BE) and meeting with the director Ir. René Ginckels. This station is mostly addressed to research trials on cultivation techniques for the main fruit

crops (apple, Pear, cherry, etc), including varieties evaluations, cultural techniques, pest management and post harvest. This visit was of interest to compare the research programs carried out on berries with other carried out on berry.

### **C) Marketing**

1) Visit to the Veiling Hoogstraten cooperative and meeting with the director (Gaston Opdekamp). The director and the responsible of the cooperative described the main areas of origin of the products, how is transferred to the cooperative, the storage systems, the fruit management and packaging and also the commercialization system (asta). The main products of the cooperative are: strawberry, tomato and pepper. Of interest was the visit to the structures of the cooperative, including the frigo for fruit storage but also for the strawberry plants from the nursery production (Elsanta TP). This is a service offered by the cooperative to the growers that can store their plants until the plantation at a reduced cost.

The different cultivation techniques adopted by the different growers are followed by the cooperative which is interested to promote the 'continue' production (from half April to December) of high quality strawberry standards. This organization has the main aim to avoid the production peak that can affect the price of the product.

2) Visit to BFV Belgische Fruitveiling CVBA cooperative and meeting with the technical responsible Rudi Peters. This Cooperative is located in est part of Belgium and has the main aim to commercialize mainly apple, Pear, cherry, strawberry and other berries. It is representing about 1600 growers, mainly from Belgium but also from Germany. About 75% of the production is exported in other EU countries such as Germany, France and UK, but also with a recent increase of exportation rate also addressed to Russia. The growers, member of the cooperative, are cultivating mainly the following everbearing strawberry cultivars: Charlotte e Albion, but some also Malling Pearl (even if susceptible to Phytophthora) and Evie2 (with low flavour). Other junebearing cultivars are: Elsanta, Sonata, Figaro, and recently is increasing the interest of Clery (for the the earlyness).

### **Conclusions**

The experience at the Hogstraten research centre and to the other research stations and private company resulted of particular interest and allowed to improve my knowledge on the main different cultivation techniques adopted for strawberry cultivation in Belgium, Netherlands and also Germany. But also the different techniques that are now offering the possibility to have a 'continue' strawberry production from March to December so to reduce price oscillation on the market. Furthermore, the opportunity to meet and discuss with the responsible of the main research institutes and private company was extremely useful so to better understand the integration among all these different realities and in particular their different level of organization. Furthermore, the visit to the different breeding station and the meetings with the breeders was extremely useful for gaining interesting informations on their activities and strategies used for the different breeding programs but also for promoting the exchange of different genetic material (cultivars and selections).

The success of the STSM was mostly do to the collaboration and support of Els Desmet and Ward Baets. They provided a well organized work plan for all the activities to be carried out in the Hogstraten research center and also of all the visits to other research centres and companies located in Belgium, The Netherlands and Germany. For this I am extremely grateful to Els and Ward, but also to Dirk Vermeiren, Loes Verbaeken e Veerle Snels for their availability.