International Soft Fruit Conference 2016

Dr David Pennell reports

Selecting the right polythene cover

Polythene films now play an essential role within the production systems employed by growers of all soft fruit and, with more films available than ever before, choosing the best for each situation isn't getting any easier.

Dr Burkhard von Elsner, retired senior researcher at Biosystems and the Horticultural Engineering Department of Leibniz University, Hannover, Germany.

Dr Burkhard von Elsner, retired senior researcher at Biosystems and the Horticultural Engineering Department of Leibniz University, Hannover, Germany, is one of a rare breed of horticultural engineering experts who has concentrated on greenhouse design and covering materials, especially glass and plastics. Speaking at the International Soft Fruit Conference in Holland in January he delivered a 'tour de force' on the physical properties of some of the plastic films now available to growers.

Dr von Elsner encouraged growers to develop their understanding of technical data to help make best use of what's available. He advised that growers always ask for a full technical data sheet and never let their decisions be driven by the cost factor alone. Crucially, the tensile strength, elongation at break, durability, the ability to transmit visible light and UV radiation, haze, ability to transmit heat radiation, thermicity and anti-fog behaviour, can make a difference as to how crops respond to covering.

Molecular testing for plant quality

Frank Hoeberichts of NSure outlined work that had been undertaken within the recently completed QBerrySure project (2012 to 2015) that aimed to develop strawberry quality assays using innovative molecular diagnostics, integrated with crop management systems. This will allow the optimization of downstream chain decisions and production management, thus preventing losses and improving product quality and sustainability. DLV Plant, in The Netherlands and the UK, Wallings Nursery Ltd in the UK, Neessen Aardbei En Aspergeplanten V.o.f. and Nsure bv in The Netherlands, collaborated in the project. Using StoreNSure Strawberry it's possible to determine whether the young strawberry runner plants are vital enough and can be lifted to be put into cold storage with a good storability. To ensure good quality plants after storage, strawberry plants have to be lifted at the right moment, when they have enough cold hardiness. The StoreNSure test can be used to determine this moment. With one sample NSure can determine what stage the sample is at: 'Ready' or 'Not Ready' for cold storage. Sampling has to be done before starting to lift the plants and involves taking 25 plants at random from one field, sending them to NSure and receiving a report of the position.

Developing long cane production of cane fruits

Problems with the propagation of blackberries from root cuttings for long cane production systems had been addressed by a Swiss team at Fachstelle Obst of Strickhof, Zürich. Hagen Thoss explained the work they had done in applying tissue culture to produce high quality tray-plants using a technique first developed over 30 years ago. He emphasised that for the technique to be successful, healthy basic/primary material and strict QA/QC systems, together with specialised cultivation skills, were needed. The work

carried out in Switzerland had been highly successful for producing good quality tray-plants that over-wintered well, and when planted out, produced good shoots from which to select long cane plants for cropping.

Willem van Eldik, Senior Consultant with DLV Plant (now Delphy) outlined the work he and his colleagues had been doing on long cane raspberries and blackberries under protection. Work focused on using primocane raspberry varieties, with the use of healthy propagation material being crucial, and starting with cuttings in December and raising high quality plants to establish plantations. Varieties being assessed included Amira, Regina, Tulamagic, Paris, Versailles, Kwanza, Kweli, Adelita and Lupita.

Willem van Eldik, Senior Consultant with DLV Plant (now Delphy).

Willem reminded growers that the storage of plants before planting had to be perfect, as any deficiencies would have a negative impact on establishment and crop performance. Growers needed to look out for diseases such as Phytophthora, Botrytis, Pythium and Fusarium, and storage could also affect bud-break in production areas. To help get this stage right, the NSure molecular system is being assessed to test the quality of the plants and the condition in which they should be for best storage and subsequent cropping.

Originally the work on blackberry long cane production used root cuttings, but this technique had led to blackberries with irregular fruit and flowers, difficulties in propagation and with achieving the numbers of plants needed. Now work using blackberry tray-plants propagated from tissue culture looks promising and is set to be much more useful for producing the right type of plant.

Bio-control an essential part of soft fruit production

Bart Sels of Koppert BV presented information from the work being carried out on the control of thrips using *Amblydromalus limonicus* in strawberry crops. The first release took place at the start of flowering on 10 March 2011 and further introductions followed on three occasions on 17 March, 31 March and 14 April. 100 predatory mites per sq.m were introduced by sprinkling. Performance was compared with *Neoseiulus cucumeris, Amblyseius swirskii* and *A. Andersoni.*

Amblydromalus limonicus was present in strawberry crops in moderate and hot conditions. *Amblyseius swirskii* performs even better in hot conditions but the best control of thrips was achieved with A. limonicus. Feeding with pollen did not improve predator efficiency. *A. limonicus* offers a number of benefits as it feeds on the first and second larval stages of thrips and on all larval stages of white fly. It performs better in low temperatures than A. swirskii and over a wide temperature range.

Bart Sels of Koppert BV.

Bart Sels reminded growers that integrated pest management (IPM) and bio-control need a different approach to be successful. This included starting on time, accepting that beneficials are the backbone of the programme, following advice, using enough predators, being patient (as there are no quick results), being prepared to accept a low level of pests in the crop, only using chemicals when really needed and not losing control.

Spider mite (*Tetranychus urticae*) in raspberry crops continues to present challenges to growers across Europe and Bart Joosten of Biobest outlined the general approach for the use of biological controls. *Phytoseiulus persimilis* predates all stages of the prey and develops very fast. It lays its eggs within spider mite concentrations and their webbing with up to 60 eggs, but needs food to survive. *Amblyseius Californicus* is clear white to brown and has a daily menu of adults, larvae, eggs and pollen. It prefers larvae and nymphs and needs to be introduced as a preventive, but can lay up to 50 eggs and has better resistance to higher temperatures (35C) and low relative humidity. It can survive longer without food than some other biological control agents.

Amblyseius andersoni is almost the same as *Californicus* and active against many types of mites. It also feeds on thrips, pollen, honeydew and fungi and has a temperature tolerance from 6C to 40C but needs to be introduced as a preventive predatory mite.

Bart Joosten of Biobest

Results from trials in the Netherlands and Belgium in 2015 were good, with *Phytoseiulus persimilis* introduced as a preventive at 20/sq.m with additional introductions at 10-15/sq.m and Floramite as a corrective if needed. In Germany in 2015 *Amblyseius californicus* was introduced as a preventive at one sachet per three sq.m with *Phytoseiulus persimilis* used as a curative at 20/sq.m. Two or three introductions were needed on occasions, with Floramite as a corrective measure, but Bart Joosten emphasised the importance of using a pH stabiliser to achieve pH5-7. Generally, results in 2015 had been positive, but it was essential to start with a preventive introduction.

A new raspberry spider mite, *Neotetranychus rubi*, has been seen since 2013 in Germany. It produces less webbing but, until now, no good results have been seen with Phytoseiulus and Amblyseius species. Preventive action has been taken in early plantings: *Amblyseius andersoni* at one sachet per 2sq.m and at the end of March, *Amblyseius californicus* at one sachet every 2-3sq.m. As a curative treatment, on seeing the first spots of red spider mite, 20 phytoseiulus/sq.m should be introduced, with subsequent introductions of 10-20 phytoseiulus/sq.m, as required. As with all bio-control methods it is essential to start early.

Peter van den Avoird explained that the newly designed glasshouse had been tailored for the production and hardening of strawberry and raspberry plants

Nursery visits

The visits on the day following the International Soft Fruit Conference provided an insight into soft fruit crop production. Delegates were privileged to visit the new production location of van den Avoird Trayplant (www.trayplant.eu) in Molenschot. Van den Avoird Trayplant specializes in the propagation of raspberry and strawberry plants, both June-bearers and ever-bearers.

Welcoming everyone to the facility Peter van den Avoird

Delegates examining Sonata strawberries grown under lights.

Looking around the new facility, the first crop, raspberry root cuttings, was being put through the glasshouse.

Some batches of Sonata strawberries, under lamps, were in full production in January.

explained that the newly designed glasshouse had been tailored for the production and hardening of strawberry and raspberry plants under optimum controlled conditions to give the company much more control over the production process. This would give consistent plant quality and enable batches to be timed to meet customers' needs. The glasshouse covers 2ha and the company has permission for a further hectare. The company relies upon a permanent staff of about 25 as much as possible, but this can increase to around 100 at peak times.

Looking around the new facility, the first crop, raspberry root cuttings, was being put through the glasshouse. The first batches were looking good with staff busy sticking further batches. Quality is a major driver of the new facility and each stage of production, explained Johan Nooren, Customer Relations and Innovation Manager. Indeed, all trays in production are well labelled to reduce any risks of varieties becoming mixed. The glasshouse has under-floor heating and air-heating together with thermal and side screens. Plants can easily be moved to the growing glasshouse by a system of conveyors which transfer trays of plants through hatches in the walls. The growing-on house has glass walls that slide open to enable more control over conditions. It is in this glasshouse that the plants remain until being dispatched. In common with all Dutch growers, a rainwater collection system is in operation that enables the recycling of water; but this is only used on the adjacent outdoor beds reserved for long cane production. A block of new cold stores is available for holding plant material.

The second visit, to units in the Breda area, featured Sonata strawberries being grown under glass. The crop was programmed in batches that started cropping in mid-December and was scheduled to go through until the end of April. Some batches, under lamps, were in full production in January - an amazing sight. Planting had taken place, using tray-plants, from October to the end of December. Cold storage before planting ensured that dormancy requirements were met and day-length controlled for optimum crop development. The grower generated much of his own electricity requirement. Solution EC levels were used to closely control nutrition and the development of fruit quality.

The visits ended with lunch at Aardbeikwekerij Verpaalen in Rijsbergen, a producer of strawberries, strawberry mother plants and tray-plants, and raspberry long canes. ◆