# APALl European Study Tour July 2006

Tony Russell
Apple & Pear Australia Limited

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# APAL European Study Tour
# July / August 2006

## FINAL REPORT

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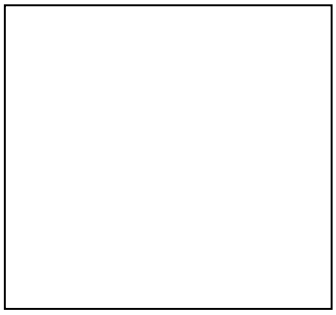
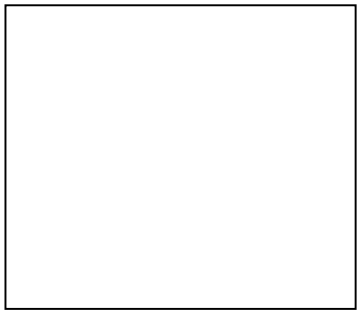




# Contents

## Media Summary

The primary focus of the study tour was to provide exposure of industry participants to leading edge orchard management techniques including tree training systems, hail net structures as well as packing shed management and technology. Comparative costs and the economics of production were also a keen area of investigation in all production areas visited. The experience has provided the group (who include some current industry leaders and a number of younger growers) an appreciation of accepted production practice in other important growing regions of the world and what is required to become globally competitive.

High density orchards on dwarfing rootstocks offer many benefits to growers, including ease of pruning, thinning and harvesting as well as higher productivity (yield). Most European growers store and pack their fruit through cooperatives or large commercial operations with benefits of economies of scale, marketing power and services to growers including orchard advisory services. First hand exposure of these operations to this study group provides an excellent means to transfer best practice systems with more urgency into the Australian industry.

Four major production areas were visited by the tour group which comprised 17 growers, a technical advisor from each of the two major Australian apple packing co-operatives, technical advisors from the Victorian and South Australian agriculture departments, a technical advisor from a commercial input supplier to horticultural industries and the Business Manager from Apple & Pear Australia Limited. Production systems were investigated in Switzerland, the Bodensee area in southern Germany, the South Tyrol region of Italy and southern France around Avignon – Montpellier. The French area was chosen as the climate is something more akin with conditions experienced in Australia while the other areas were chosen for the predominance and experience in high density orchard production.

The study tour will leave a lasting impression on participants, particularly the expansive use of intensive orchard systems in South Tyrol and Bodensee areas, the uniformity of orchards and the support mechanisms available to producers in the form of comprehensive advisory services and subsidies from the European Union. The netting structures erected in Europe are of a lighter and cheaper structure than seen in Australia and these may provide cost savings if they can be adapted to our conditions. Nursery tree production was a revelation to participants with European growers having ready access to high quality nursery trees at comparatively low prices to that available in Australia.

## Highlights and Impressions from the study tour

- Swiss apple consumption is between 20-25kg per capita – this is more than double Australia's demand showing that there should be an opportunity to increase consumption in Australia.
- Swiss Government support for agriculture is significant – environmental management is a key part of this.
- Beneficial insect research findings in Switzerland may provide advantages for Australian IPM systems.
- Co-operative and corporate packing operations are standard practice in Europe.
- EU subsidies for orchardists are significant in Germany and Italy but not quite as generous in France.
- Orchard labour costs in Europe are cheaper than Australia.
- Hail net structures are up to a third less than the cost in Australia (although structures are generally less robust).
- A mechanical tree thinning machine was inspected – could provide an alternative to chemical thinning in uniform orchards in Australia.
- Nursery trees are much cheaper and far higher quality than available in Australia.
- Tree pruning and training systems were thoroughly investigated in all areas visited – light management in the canopy is critical for optimum performance, some learnings for Australian producers.
- The Kiku® product initiative provides a unique production and marketing opportunity which may be of interest to growers when launched in Australia. However the lack of uniqueness of this Fuji strain may limit its potential.
- Pest management, nutrition and crop load (thinning) management were key areas investigated in all regions visited.
- Water availability to sustain production is generally not an issue for European growers.
- The French 'Fruiting Wall' pruning and tree training system is a 'disaster'.
- Pink Lady Europe run an impressive operation in the management and promotion of the Pink Lady Trademark.

Detailed tour notes are provided in the following pages, recorded in date order.

## Detailed Tour Notes

### Sunday 23rd July – Switzerland

*General Comments*

Switzerland is a land locked country between Germany/France/Austria and Italy. It is an independent country with its own democratic political system and is not a member of the EU.

The Swiss are large apple eaters with an average personal consumption of 20-25kg / person / year. Their markets are highly protected with the majority of fruit eaten produced by Swiss orchardists. The Swiss are currently in negotiations with the WTO regarding the protection measures that they employ.

The total apple and pear crop is approx 120,000 – 140,000 tonnes of which pears are about 20,000t. Fruit not suitable for sale is juiced, with the country producing 1.5 million litres of juice annually. 30% of all Swiss fruit consumption is apples

**Markus Elliker – Steinmaur Village**

Family History

Property purchased by Markus's father in 1958 and started as a fruit orchard. Now owned by Markus. Markus has implemented several changes the main one being the introduction of cherries into the crop mix.

Farm Characteristics

- The property is 17 ha and grows
  - 5ha apples
  - 2ha pears
  - 1 ha cherries
  - 1 ha strawberries
  - 8 ha broad-acre crops

*Marcus Elliker explaining some finer points to Ian Daynes*

- Fruits grown include
  - Apples – Jonagold, Pinova, Boskop, Gala, Summerred, Braeburn, Golden Delicious and some traditional Swiss varieties (declining in importance)
  - Pears
  - Cherries - Burlat, Merchant, Techlovon, Summit, Star, Kordia, Hudson, Sweetheart

- Rootstocks

  Apples – M.9 (Fleurin 56 – strong M.9 selection) and M.27

  Cherries – Giesla 5 and W53, W158 & W154

  Cannot get Weiroot series anymore, prefers Giesla 5 anyway

- Fruit crops are marketed using a combination of methods including

  Cherries – farm gate sales and farmers markets

  Strawberries – pick your own

  Apples – wholesalers, farm gate sales and farmers markets

  Pears - wholesalers, farm gate sales and farmers markets

- Performance

  Strawberries has been a good cash flow generator for this season no figures were given

  Cherries - Poor spring weather (cold and wet) conditions led to a poor set and approx 1/3 of normal crop, which is considered to be 2kg/m2 (20 t/ha)

Land cost is approx 15 Swiss Francs/m2 (150,000 SF/ha) this has come down from approx 25 SF/m

Labour costs approx 17 SF/hr

Climatic trends

Markus indicated his belief in changing environmental conditions – hotter summers and increasing hail. These changes were leading to changes in his management practices including the use of rain covers on cherries and hail net on most crops.

Government Assistance

Direct government assistance to growers was provided in the form of

- Annual payment of 1600 Swiss Francs /ha from Federal Swiss Government

  This is conditional on intensive producers allocating 5% (extensive producers 7%) of their land to "environmental uses" each year. In practice this means leaving 5-7% of the land to unharvested pasture each year – the producer only being allowed to mow it once in the season. **No land set-aside allocation = no government assistance**

- Traditional "high trunk" trees (traditionally grown technique) are considered highly desirable by the Government for aesthetic and tourist purposes. To encourage their retention growers are paid 15-50 Swiss Francs per tree per year to keep them. Numbers of these trees have reduced dramatically from 12 million to 2 million in 40 years.

- Hail net - Growers can access 10 year interest free government loans to erect hail netting over their crops
- Fireblight control

  There are considerable resources put into minimising the incidence of Fireblight. Each Canton (Regional Government area) has its own government funded program that oversees fire blight control and eradication programs. This involves use of predictive models linked with village scouts (experienced growers) in each village where apples are grown. Additionally each grower is responsible for monitoring all trees within a 500 m radius of their property. House gardens in the villages are also inspected and any infected trees removed (free of charge) by the local council equivalents. These removals are supported by law and can be enforced by the police if necessary.

  Even the traditional trees are not secure – these are inspected and if infections are found the whole tree is removed because it is not practical to treat them.

  Infections in orchards are removed and destroyed

Management practices - Apples

- Codling moth control is by mating disruption and the use of insect growth regulators
- Chemical thinning is done using various combinations and timings of
  - Ethrel®
  - NAA (not widely used)
  - NAD (on Gala)
  - Benzyl Adenine (BA - Cylex®) is not available yet
- M.27 rootstock is used to reduce the fruit size on Jonagold
- Most common spacings are 3.3 –3.5 m row spacings and 0.8 – 1.0m between trees depending on the varieties used (approx 2750 – 4000 trees/ha). Have planted closer but are coming back out, anything closer than 3.3m row spacings is considered too close
- Aim for 2 –2.2 m high trees (pedestrian orchards) because of cost and labour issues. Avoid ladders
- Yield expectations vary from 40-50 t /ha
- Prefer to plant “Knipbaum” trees with a minimum of 5-7 feathers for which they pay 8-9 Swiss Francs/tree
- Crab apples are used as pollinators
- Increasing use of netting – Only black and grey nets are allowed because of Government and Environmental concerns on the visual impact of white nets.

- The net supports are incorporated into the tree support systems and overall cost is up to 48,000 Swiss Francs per hectare
- Irrigation is not widely used

## Fuglister P/L

This organisation is a family business that has been in operation for 80 years and currently the 3rd generation is in control. It is a fruit wholesaler specialising in apples and pears. However it operates slightly differently to Australian wholesalers in that it purchases fruit directly from growers and stores that fruit itself taking on board the storage risk normally borne by growers. It currently handles about 10,000 tonnes of fruit which is about 10% of the Swiss apple crop and is looking to position itself better as the 2 main supermarket chains Migros and COOP reduce their number of direct suppliers.

Fuglister is the owner of Pink Lady and Sundowner trademarks in Switzerland.

The company considers the Swiss market to be 7 million consumers – a combination of Swiss citizens, non-Swiss workers and tourists.

The two Supermarket Chains control approx 70-80% of the market. They are increasing their quality specifications. They test for pressure and TSS on delivery to their stores.

Migros is a major company in Switzerland with its own supermarkets, dentists, doctors, educational facilities and also is involved in many other aspects of everyday Swiss life. It employs over 80,000 staff throughout Switzerland and is one of the largest Swiss Companies

Fuglister P/L purchases fruit from both growers and cooperatives. It supplies the bins for growers (to and from) their properties. Golden delicious is the main variety and can be stored and supplied for up to 11 months

Smartfresh has been legal since 2005 – however it is considered very expensive and testing is continuing. Preliminary results have been good

The company brings a whole new meaning to the term “vertically integrated” marketing because of the cost of land the companies facilities are housed in a 4 story building with the actual packing line located on the 3rd floor.

A new packing line has been installed which can handle multiple pack sizes from 1-10kg. These include

- Single layer trays
- Double layer trays
- 1, 2 & 3 kg bags
- 6 & 10 kg boxes.

Packaging and presentation is very important in Switzerland.

Main fruit sizes include 70-80mm and 80-85 mm. A 5mm variation only is allowed. Larger sizes are sold in the south of the country and smaller sizes in the north. There is very little export.

Grower returns this year were 1 SF / kg (Golden delicious) on farm, 2 payments are made annually - 30% on delivery based on hand grading and delivery assessment. Final payment is made at the end of the season with 5% interest added from the date of delivery.

Every month coolstore stock figures are collected by the Swiss Fruit Growers Association and the information then disseminated. There is a very high level of trust in the figures because it is in everyone's interest to have them as accurate as possible. The government uses the figures as a guide to import allowances.

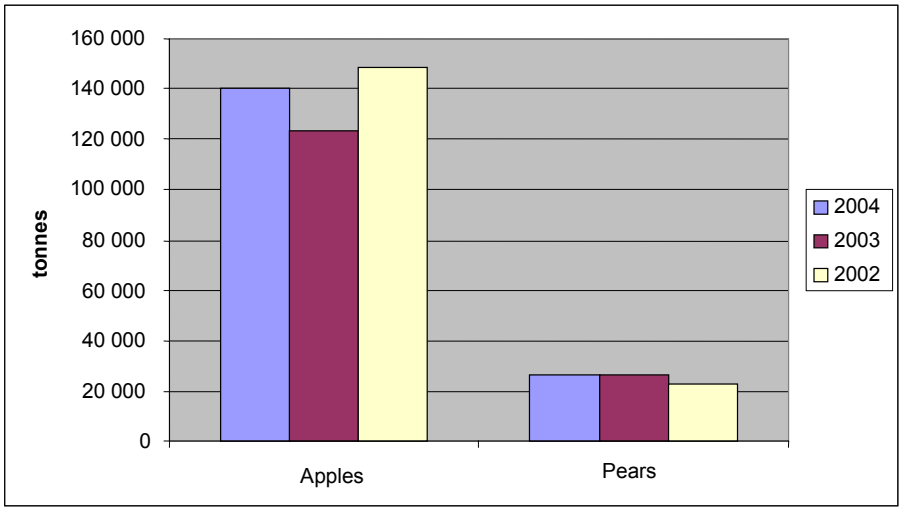
## Swiss Fruit Growers Association – Mr Bruno Pezzati

The Swiss Fruit Growers Association has approx 3000 grower and juice processor members. Apple and pear growers pay 2 Swiss cents / kg to be members (berryfruit growers 6c/kg). This based on a voluntary basis but the Association owns the Trade Mark for Swiss grown fruit, which is highly sort by consumers.

The organisation is responsible for advertising, promotion, quality work and organisational aspects of the industry.

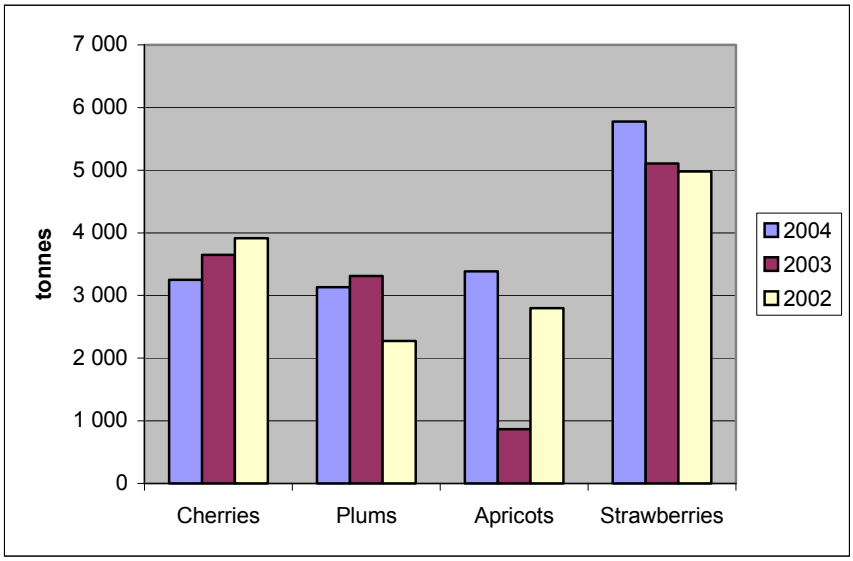
Apple and Pear production in Switzerland is shown in Chart 1.

Chart 1



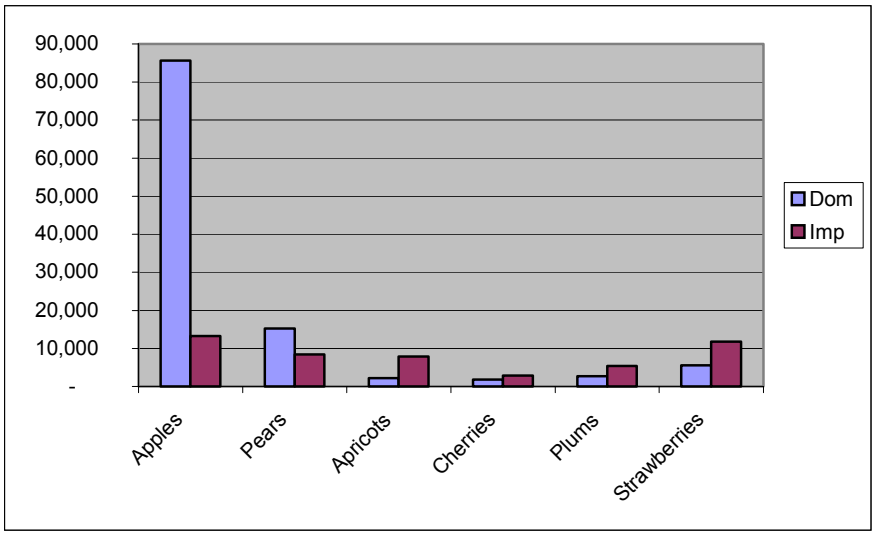
Cherry, Plums, Apricots and Strawberry production is shown in Chart 2

**Chart 2**




Average annual consumption of selected fruits over the period 2002-2005 from Swiss grown and imported sources is shown in Chart 3.

**Chart 3**




It can be seen clearly from the chart that apples are the dominant fruit consumed in Switzerland.

## Monday the 24th July

### Güttingen Research Station

Established 1967 until this year was funded by the Swiss Government – but now funded half by the local community and half by the national government.

There are two sites to the Research Centre – a 16 ha and a 2 ha property on which cherries, apples, grapes, pears, and apricots are grown for trial purposes which represents the local fruit industry. 10 ha of the research orchards are covered by hail net or plastic cover. Sales of the research station produce are a necessary funding source for the local industry funding component.

The broad aims of the National research effort are to keep agriculture competitive focusing on the following:

- Sustainable production
- Production systems
- Organic Production
- plant protection
- Fruit Quality
- Value adding

*Patrick Stadler at Güttingen Research Station*

At Güttingen there is a major breeding program which links with international breeding programs and evaluates the progeny of these breeding programs. The Plant breeder is also involved in the European High Quality Disease Resistant Apple for Sustainable Agriculture (HIDRAS) program funded by the EU. This program involves various plant breeders and pathologists throughout Europe who are mapping the apple genome with the intent to hasten the evaluation process of new seedlings as it takes up to 20 years from when the initial cross is made before commercialization of the variety takes place under traditional screening processes. The mapping of the genome will enable the breeders to quickly scan seedlings for the identified characteristics by genes identification and eliminate the undesirable seedling very early in the process. This is not genetic modification.

The Aim of the local breeding program is to provide varieties with superior quality based on:

- storage
- flavour
- shelf life
- texture
- Productivity (yield and tree shape) and

- Disease resistance

Ten to twelve thousand seedlings are planted each year about half are planted out after the initial screen and the second year about 600 are grafted on to M27 rootstock. The first fruit appear in 4-5 years.

The Swiss have two relatively new apples from the local breeding program – both are named and registered.

- DIWA also known as MILWA matures one week before Golden Delicious.
- MAIRAC is a Galaxy by Marigold cross

Neither of these varieties carries disease resistance characters. All progeny from these two varieties forward are exclusively screened for disease resistance, both apple scab and powdery mildew. This is the main focus of the current breeding program. The scab resistance is being selected for both VF and robusta (crab apple) resistance as there has been evidence of breakdown of the single phase resistance in previously resistant varieties.


*Two locally bred Swiss apple varieties*

At the research station, plant protection research involved pesticide screening for tolerance by beneficial insects. One such trial was the pesticide screening for earwig safety. One interesting tip was the introduction of earwig homes – these were inverted small clay pots which were hung in the trees and were stuffed with a wood shaving like material to keep the earwig in the tree and dry. This was the means of introducing the earwig to the orchard for biological control of pests.

## Lake Constance - Germany

Fruit production in the Bodensee area

In the area 8000 ha is under fruit production. In this region there are 400 farmers in the growers association accounting for 3500 ha of production.

The Bodensee area is one of the two most important food production areas in Germany. It also has wine production and is a popular tourist area.

The area receives about 1650 hours of sunlight in season. Generally the rainfall is 900mm per year (ranges from 700mm in western part of Bodensee to 1400mm in the east), with an annual mean temperature of 8°C. (Mean temperature from April – October is 12.9° C). Rainfall in the critical growing months from April to September is around 570mm (but not this year).

The average farm size is 16 ha. Apples and pears are the most important fruit crops. Jonagold (36%), Elstar (19%) and Golden Delicious (10%) make up more than half of the production. There is also some production of Gala (Galaxy, Mariot and Brookfield), Braeburn and Fuji (Kiku 8). Kiku is largest new variety in the region.
Cameo is the first club variety in the area. There is also some Kanzi (gala x braeburn) and Jazz. The variety testing program at the research centre has shown that Jazz has a better quality than Kanzi. Green Star has also been introduced. It has a flat flavour but is highly productive, in the 3rd year producing more than 20 kg/tree. Topaz is the variety preferred by organic producers as it is scab resistant. All apples are on M27 rootstocks.

For pears, Conference, Concorde and Williams are the major varieties. Pears are considered to have a good market at the moment. There are also some plums and cherries produced in the region.

The biggest organic production in Germany comes from the Bavendorf area. Growers can receive 3-4 times the income for organic production. However it was seriously questioned whether organic was actually better than conventional as it required 45 sprays per year versus 25 on conventional.

In this area, the Government pays 4-5 Euros/tree/year to growers to keep old fruit trees on their property and therefore preserve the countryside. There are currently 2.5 million old trees in the area.

In 2005 there were 350 hectares of new plantings. Of the new plantings Kiku-8 has been most heavily planted, with over 120 000 trees.

There is also interest in Kanzi in the area. The cost of Kanzi is 5.75 Euros for 1 tree ( 1.5 Euros royalty for the tree)

## Salem Frucht Packhouse Visit

A new packhouse was built as a merger of three packhouse to achieve the economies of scale. The packhouse is a joint venture by Reiner Wielatt, Marks and Spencer and Tesco - the two British supermarket chains.

The new packhouse is a commit-to-pack operation with extensive pre-grading using water flumes and the IQ blemish sorter. The packhouse stores and packs around 30 to 40 thousand tonnes of apples annually. 15% of the packed fruit is exported the rest is supplying the local 80M consumer market in Germany. 240 growers, growing over 1500 hectares supply the packhouse and all fruit is accountable to a single bin and maintains its identity for traceability.

The average German apple grower grows 35ha of apples and the biggest is 40ha. The grading equipment processes at 20 tonnes per hour and the packing is carried out at 140 tonnes per day with 60 to 80 people. Much of the packing is slow due to the multiple packages used in the market. (One thing to be grateful for in Australia).

Labour costs are €15 to €18 per hour for packhouse staff. Fruit is CA stored under ULO storage at 2 to 4 degrees Celsius and the Golden Delicious is stored at below 1% $O_2$ using Chlorophyll fluorescence technology to monitor the condition of the fruit. Plastic bins are €62 and wooden bins are €42.

## Orchard Visit - Thomas Lohle - Lake Constance

*Thomas's 3rd leaf kiku 8 on M9 - all under hailnet*

The philosophy of this innovative grower was to adopt the new varieties ahead of the pack. The orchard has grown from 4 ha 15 years ago to 40 ha today with 100% hail netting.

The initial planting of 7 ha of Braeburn was planted at 2.6 M by 0.5 M – 8000 trees per hectare 12 years ago. This was as a result of a major over supply of nursery trees and they were purchased very cheaply and hence the high tree density. Thomas has 5ha of Gala, 12 ha of Elstar and 13 ha of Kiku Fuji the latest plantings. The Fuji were planted at 3m by 70 cm – 5000 trees per ha.

EU subsidies are interesting. As quoted on the day, the German orchardist gets a subsidy of €10,000 per ha per year for growing apples and a hail net subsidy of €5000 per ha per year over 10 years. (This equates to ( $A 960 000 per annum for the 40 ha block).

The Kiku orchard was expected to produce 40 to 60 tonnes per ha in the third leaf. Hand thinning was taking 100 hours per ha. The trees and orchard were in excellent condition.

### Hagnau Village Distillery - Walter Gutemann (owner)

Distilling grapes, sour cherry, Williams's pears, small European plums, and apples. Producing a 40% alcohol product and can sell it back to the government in lieu of tax.

Europgap™ is mandatory in Germany which requires an annual audit. (€320 per year). It is treated by the industry with the contempt it deserves. The cheap polish worker is acceptable under the Europgap™ protocol as these workers despite being exploited by the European apple growers are still getting more than they would get at home. So this is legal.

The market is changing in Germany, in the last 5 years the discounters like Aldi have taken market share from 5% to 50%. Consumers are more price conscious than they were before. As a point of difference the discounters are demanding lower and lower residues in their food and are now demanding produce has no more than 4 detectable residues summing to a benchmark residue.

## Tuesday 25th July 2006

### Kompetenzzentrum Obsbau Bodensee, Bavendorf
(Bavendorf Research Centre, Bodensee)

The focus of the Bavendorf Research Centre in the Bodensee is mainly on improving production of apples, pears and pip fruit in the Lake Constance region and linking science with practice. This centre was founded in 2000 and is a combination of the university, department of agriculture and the grower organisations. Manfred Buchele, the business manager and economist at the research centre gave the group an outline of the research centre activities as well as local fruit production issues.

The research centre is 25 ha in size, with 2.5 ha for ecological production (organic), 2.5 ha for buildings and the rest for fruit production research. It also has 100 tonnes of standard cool storage, and 80 tonnes of controlled atmosphere storage.

The major activities of the centre include

- Plant protection
- Post harvest
- Ecological Production, and
- Variety testing

The variety testing activity is looking for apples that have a low susceptibility to spring frost and apple scab. Currently more than 200 new varieties of apple are being tested. Organic farmers are particularly interested in varieties that are resistant to apple scab.

There is a deposit of old varieties at the centre. They are also looking at commercialising a service whereby DNA fingerprints can be made of varieties.

Production Challenges

Two of the biggest challenges to fruit growing in the area are hail and oversupply of fruit.

In terms of dealing with oversupply, growers were now looking for opportunities to grow fruit that was not easily stored and transported such as cherries and other soft fruit. Cherries are returning 3-4 times the income of apples. On average cherries receive 3.50 Euros/Kg, and growers are generally getting 10 tonnes/ha. Strawberries were also returning 50,000 Euros/ha.

Hail is becoming more of an issue in the region. In 2000-2001 30-40% of the production was destroyed by hail and some farmers were affected three times. Growers were now trying to overcome the problems of hail by installing hail net. The net is considered a better option than hail insurance

The cost of installing hail net in the area was approximately €11000-12000/hectare. The EU pays 40-50% of these costs through the producer organisations (co-operatives) who then pay their grower members. This also means that growers must deliver their apples to that organisation. If growers are not members of the producer organisation the government will pay 20% of the costs of setting up the hail net.

Breakdown of the hail net costs is

- Net €3000
- Wires €2000
- Clips €2000
- Putting net together €1500
- Labour €3500.

It also costs €150 to close and open the net each year or as required.

*Hail net at 4.5-5m high at the Bavendorf research centre*

Growers in the area are installing hail net at 4.5-5m high. This is because growers are getting 15% more apple production with higher trees.

The posts used when setting up the net include concrete, pine, acacia, and steel costs are the same for all of them. People did not trust the concrete as the area was very windy.

*Red netting at the Bavendorf research centre*

*An example of one form of cherry protection at the Bavendorf research centre*

In terms of the production needed to make the net viable, it was suggested that it was only appropriate to install net over a high returning variety. The aim for production is a return of €10,000/ha. The average for the area was a return of €8,000/ha. Some growers however were only receiving €6000/ha and these are generally the ones with old varieties. Braeburn at 40t/ha is considered a good crop here. At 30-35 t/ha it can gross €40,000/ha.

The research station has installed various different net colours. A new PhD project is to determine the effects the different colours has on fruit.

Cherries also specifically need a protection system. In the area plastic covers are being used for rain protection and cost €30 000/ha. One system at the research station was developed by a local grower, which consisted of plastic panels, rather than plastic sheeting. This was found to be more wind resistant.

Labour costs

Labour is more than half the production cost in Germany. Currently Polish workers make up a lot of the work force on orchards. If workers only stay for 50 days in Germany they are paid €5.30/hour and the orchardist does not have to make contributions to super/social security. If workers stay longer they are paid €8.78/hour which includes contributions to super/social security. Only 10% of German orchardists pay the €8.78/hour. In Poland these workers would only be receiving €1/hour.

Marketing

Germany is the biggest market in Europe. Every Thursday, price estimation occurs. The growers and associated organisations come together to estimate prices in the next week. This is so that everyone can have good information to make decisions about marketing. Growers pay €50 per year to have the information from the service straight away, or if they are not members the information is published in the paper later in the week. The government funds the price estimation and farmers pay to be part of the service. It costs €200,000/ year to have the service. Grower memberships contribute €75,000/year.

Hermann Gessler, Apple Grower

Hermann's property is 35 ha and he has 750 tonnes of his own storage. Most of his production is apples (32 ha), with 1 ha of cherries and 1 ha of plums. Of the apples he is producing 35% Jonagold, 25% Elstar and 10% golden and gala. On average he achieved 32 tonnes/ha. Fruit is

*Hermann Gessler with his Tree Darwin thinning machine*

picked using picking trains and is packed into 18kg boxes.

One of the most interesting aspects of Hermann's operation was his use of the 'Tree Darwin' for flower thinning. The Tree Darwin is a mechanical thinning machine, which cost 3500-4000 Euros. It consists of columns of 90cm long nylex string that rotates. It takes the whole flower off causing a strong ethylene shock. The best timing for the machine thinning is at full bloom, just before petals fall off the flower on 2nd year old wood. The machine travels at 10-13 kms/hours with 80-400 revolutions/ minute. If the amount of string is doubled on the column it can travel at 20km/hour.

*The rootpruner developed by Hermann*

The use of this machine reduced the amount of time needed to hand thin when compared to chemical thinning. When chemical thinning had occurred (with BA ATS 5 x dilution) it took 8 hours to spray and then 120 hours to also thin by hand. With the Tree Darwin thinning required 1 hour by the machine and 40 hours by hand. The use of the machine is not temperature related, but Hermann doesn't use it when it has rained as it causes too much damage. The angle of the column with the nylex string can also be changed for younger trees to only thin the bottom.

Hermann had also developed his own root pruner. Every year he does rootpruning on one side of the row as close as possible to the trunk. This is done in late February early March. There were no problems with suckering as there was a wheel that pressed down the soil after the pruner.

Georg Eberle, Apple Grower

Georg Eberle is an apple grower with 21ha of apples. His varieties are Topaz, Gala, Cameo and Braeburn. He chose Topaz for its scab resistance and saves 1/3 on pesticides with this variety. The Cameo are all netted and planted at 3.5 x 1m (2500-3000 trees/ha). Cameo has a more regular yield and better marketing and averages 45t/ha which is higher than Gala.

Georg uses both Regalis® and root-pruning for vigour control in his orchard. He uses Regalis® twice, the first time with a higher rate and the second time with a lower rate. He starts at balloon stage when there is enough foliage for absorption. On Cameo he starts with 1.25kg/ha and for the second application 1.0 kg/ha. He aims for 200 mm shoot growth in total.

*Georg Eberle's cameo trees planted at 3.5 x 1m and covered with hail net*

*Evidence of the rootpruning at Georg Eberle's orchard. There appeared to be suckers growing from the roots where pruning had occurred*

Georg also uses Surround® at 6 kg/ha.

One of the most important factors in this orchard was the use of good quality nursery trees, which resulted in early production. Trees that were planted in the spring of 2005 will produce approximately 5-6kg/tree (12-18t/ha).

These trees were Knip trees and cost 4.6 Euros each.

## Wednesday 26th July 2006

### Upper Vinschgau Valley, South Tirol, Italy

Host: Rudy Gartner at Láces (translator: Nicole)

1. General Geography
   - elevation 500-1000m
   - 4500 ha apple orchards, 12 million trees
   - mountains to south (Alps) are ~3000m (holds cold air to the north and keeps warm air from Mediterranean – warm air blows up the valley)
   - apples and wine grapes grown to 1000m elevation
   - approximately 60 ha of apricot orchards in Upper valley
   - 300 days sunshine/year
   - 450mm rainfall (2/3 in winter)
   - problem is that there is a lack of land, therefore there has been a tendancy to push production up the side of the mountains where possible
   - Land is valued at €60-80/square metre

2. Water

- Excellent irrigation system fed by gravity from glacier source (enough to last at least another 2 generations)
- Old water reticulation systems were built >1000 years ago but the primary system sourcing the glacier water was constructed in 1939. The main pipeline was replaced 10 years ago at a cost of €6000/ha for all the producers (this was not subsidised)
- Inadequate rainfall to support fruit growing so irrigation is necessary
- Cold air/low rainfall assist in parasite control, therefore assist in integrated pest management and meeting Eurepgap requirements

3. Labour

- All small family run farms (average 2.5ha)
- Generally important that one partner in family farm (usually woman) has off-farm work to supplement income (eg school teacher)
- Most of the farm work is done by hand – helps quality, eg hand thinned generally, involving 140 hrs of labour in June to get the same size in fruit
- Most labour is now from Eastern Europe (Slovaks/Poles) paid €6.5/hr
- Approximately 7000 workers are required in season (housing and food is also provided)
- Worker insurance is €2.5/hr, therefore total cost of labour is €8.7/hr + food and accommodation.

4. Orchard Structure / Varieties grown / Performance / Management Practices

- trees are all spindle
- most plantings are 70cm spacing in 3m rows (single rows)
- most rootstocks are M9 (D337), some Pajam 1
- Golden Delicious (with red blush that is unique to upper valley) 60%, Red Delicious 15%, Gala ~10,000T production, Braeburn (not so popular because winters too cold – effects blossom), Pinova – blossoms all season so is a problem for fire blight), Fuji only grows well to 600m altitude and Kiku / Kiku 8 is only grown to ~400m. Sonya – no good, Cameo – no good, Kanzi – will be trialling.
- Yield average is between 50-60 tonnes per hectare
- Growers look to make fruit of consistent size and from 3000 trees/ha aim for 20 kg fruit/tree with 110 apples of between 75-80mm giving 60 tonnes/ha

- Thinning – chemical
  - Use Garamid (NAD) 2kg/ha at full bloom (or 1kg/ha X 3 days apart)
  - Then Carbaryl @ 15mm fruit size, 1 litre/ha (or 2 treatments 7 days apart)
  - Apply chemical with electrostatic sprayer at 1000 litres/ha (diluted rate) / 180 litres (contentrate rate)
- Diseases / pests
  - Black Spot – 6 to 7 sprays required during season
  - Russett is a problem because of dry atmosphere
  - Codling Moth is present – use pheromone mating disruption techniques (BASF pheromones), had to spray once for codling moth this year due to warm/hot season, used chlorpyriphos (1 treatment).
  - Woolly aphid is a problem (in June) – difficult to control, Confidor can be used once before blossom.
  - Powdery mildew is a problem.
  - QA systems and controls have restricted the usage of Carbamates to 2 applications/year – prefer to use for thinning
- Fertilizer
  - Soils are generally very good in the valley (deep and fertile)
  - Apply 60 kg N for whole year
- Weed Control
  - Roundup / MCPA (applied after thinning – on days <15˚C). Roundup generally applied twice during season.
- Orchard structures
  - Trellises comprise 2 high wires (2mm stainless steel wire) on recycled plastic stakes, trees locked in with 'Easy Fix' clips
  - Hail netting is not so common in Upper valley as incidence of hail is low (tend to have hail only every 6-8 years) – much high incidence in lower valley.
- Irrigation
  - Almost entirely applied by overhead sprinklers
  - Doubles as frost management system, activated when frost threatens, system has capacity to provide adequate water to protect all threatened areas.

- Nursery Trees
  - Nursery trees (tagged and numbered / virus free) are €4.2 each, generally have around 7 feathers (they prefer 12) over 50cm of the main branch, feathers start 80-90cm above the ground. Rootstocks must be grafted at least 25 cm above the ground, minimum stem diameter above graft = 25cm.
  - Trees are ordered 2 years in advance and inspected twice /year
  - Growers pay for trees 6 months after planting (allows them to withhold payment if they are not happy with trees)
- Yields from intensive plantings
  - no crop in year 1
  - aim for 2-3kg/tree in year 2; 8-10kg/tree in year 3
  - Aim to achieve 60 tonnes/ha in year 5

5. Packing / Marketing
   - Majority of fruit is packed through 7 cooperatives and marketed through a single combined entity – VI.P.
   - Sell to 3 major supermarket chains – Metro / Carrefour / Conad (has been difficult as restricts marketing options)
   - Local co-operative packing house in Laas has current capacity of 45,000 tonnes storage capacity but needs to expand to 65,000 tonnes (construction under way – costed at €1.6/kg). Standard CA storage would cost around €0.7-0.8/kg (this could be enhance with the use of Smartfresh) although they have elected to invest in the higher cost storage which has been trialled successfully over 4-5 years. Their storage system works well for Kiku/Gala/ Fuji, but no good for Braeburn

6. Costs

| | | |
|---|---|---|
| ▪ Cost of production: | | **€/kg** |
| - | Growing (to harvest) | 0.21 |
| - | Harvest | 0.07 |
| - | Storage | 0.07 |
| | TOTAL | **€0.35/kg** |

7. Grower Training

   All apple growers must do 4 years of training (combination of theory and practical) in orchard management, use of pesticides, QA management, etc. This training is mandatory if growers are to gain access to EU support and also to gain Eurepgap accreditation. (note that growers over 50 years of age are exempted).

## Thursday 27th July

### Laimburg Research Station

- The research station was developed in 1970 from farmer's demand for greater knowledge, in their specific areas of interest.
- The South Tyrol began specifically as an agricultural region, however tourism and the production of power from hydro-electricity are becoming more important.
- The production of Cherries, Apricots, Apples, Wine, Milk and Beef are the main agricultural interests. Herbal medicines are an up and coming agricultural industry.
- The research station has an advisory board, which raises grower problems and also helps to diffuse the information to the growers.
- Apples make up 18,000 Ha of production and there are 8,000 growers. The average sized farm is 2.5 Ha. With the right variety it is possible for a farm to survive off 4 Ha. 50% of the growers have part-time jobs off farm.
- In the region apples are grown to 1,000M above sea level.
- Vineyards make up 5,000 Ha with 60% red and 40% white.
- Approximately 12% of people derive their income from agriculture, whereas only 3% of the people in Germany derive their income from agriculture.
- The research centre is totally public, 50% of the research station's budget is derived from the sale of apples and 50% is publicly funded.
- The South Tyrol is ruled as an autonomous state, with the local government having control over 90% of the taxes collected from the region. Combined with the fact that there is a strong agricultural focus in the South Tyrol, Laimburg research station obtains a higher proportion of government funding than most research stations in Italy.
- In the region, most growers sell to the co-ops, of which there are currently 35 co-ops who sell through two marketing channels, VIP and VOG.
- In the South Tyrol, approximately 4% of the 18,000 Ha of apples grown are replanted annually.
- Of the 18,000 Ha of apples grown, approximately 4% are organic which makes up 25% of all organic apples grown in Europe. Most of the organic apples are grown in the Vinschgau valley due to the low rainfall, approximately 400 – 500mm annually.
- Laimburg is quite involved with NIR (near infra red) maturity testing which is a non-destructive form of testing the brix and pressure of the apples.
- In the region, hail is a significant problem with 4,000 Ha normally affected. White hail net is forbidden due to it being perceived as unsightly therefore only grey and black hail net are allowed to be used. This leads to problems with the colouring of fruit.

- 50% of the apples grown in the region are Golden Delicious, this is considered a stable figure. The variety that is expected to grow in volume planted is Cripps Pink (Pink Lady). Fuji is likely to stay the same due to problems with biennial bearing.
- When doing a variety evaluation, they are looking for; Shaping, Size and production. 1-2% regression is considered good. Evaluations on new varieties are done at the 3 rd and 4$^{th}$ leaf. Regression can become a problem when blindwood is used.
- If a new variety is to be bought into the region, the co-op and the union will make the final decision.
- Laimburg has the nuclear stock therefore they hand the stock out to the nurserymen.
- Tree pruning is being researched quite heavily. There are three main pruning techniques that are being developed / fine tuned.
- Rough pruning straight after harvest and then detail pruning done during the season. Pruning after harvest helps reduce vigour as there is a flush of root growth which acts as a store of energy for the following season. If the leaf area is reduced after harvest then less root growth occurs thus reducing vigour for the following season. Pruning after harvest is considered to get better results than root pruning. This essentially lowers the vigour.
- Window pruning allows the whole tree to get equal amount of light. Window pruning gives the best yield, best colour and the bigger the window the better the colour. Window pruning is good for varieties like Gala and Braeburn because of the short limbs however not so good with Fuji's as they require longer branches. The cuts are very structured unlike chunk prunes. Slender spindle is considered to get the best out of the sunlight. This increases quality.

*Dr Walter Guerra and Josef Vigl explaining the window pruning technique at Laimburg Research Station*

- When tree is fully developed, pruning is done to weak buds at the top of the tree which reduces apical dominance. This stimulates the nutrients to move through the tree much better. This helps with regeneration.
- In the 70's, yields were around 30 T / Ha where as now the average yields are around 55 T / Ha.
- There are three training methods that were shown; Slender spindle, Solain and Solaxial system which is a mix of Solain and Slender Spindle
- A method of thinning was shown which recommended thinning relative to branch diameter. Sum up the branch diameter, work out the number of fruitlets you want and then leave a certain amount of fruit buds relative to fruit diameter, for example 8 fruit per square centimetre.

Kiku Company Visit, Dr. Jurgen Braun also with Thomas and Alois Braun.

- Kiku was selected in 1990 from a Fuji orchard in Japan. Kiku considered to be 20% better than the current standard Fuji. Kiku 8 is considered the best strain and has limited regression. The aim of Kiku is to produce trees that are true to type.
- The reason for going for a club variety is said to be consumers wanting a brand that they can get continuity in what buy. It also offers the grower security if consumers want a particular brand of apple. The developer trademarked the variety and made it into a club as this gave a return to the effort put in to selecting the Kiku 8.
- Non-club varieties are considered to offer no protection with competition based through price and quality. The cheapest apples destroy the market.
- As with Pink Lady, Kiku are only sold if they meet the set standards otherwise they are sold as Fuji's.
- Kiku aim is to have homogenous quality throughout the year therefore having more satisfied customers. Kiku only has one grade, 60% colour and other criteria. The potential packout is about 85%. The standards for size and pressure are set by the Kiku company.
- A lot of marketing is required to develop the name and help differentiate the product.
- If a grower is to produce the Kiku strain of fuji they have two options, the open market or the Kiku marketing system. The marketing system takes a 5% levy from the sale of the apples, 2% of which is used to continually develop the market in the country of origin and 3% goes to the Kiku company for trademark protection and help develop markets in other countries.
- On average the returns to the grower were considered to be 45% better than the standard Fuji variety. The Kiku yield potential is about 60T / Ha.
- Kiku 8 makes up 7% of fruit grown in the South Tyrol. Of all Fuji currently being planted, 90% are Kiku 8.
- The Kiku company found the market and then developed the product.

Friday 28th July

South Tryrol

House of Apples - Terlan

*Kurt Werth – Executive Director – SK Südtirol (Variety Innovation Consortium – South Tyrol)*

*"Fruit Growing in the South Tyrol"*

The "House of Apples" is the headquarters and operational offices of several organisations servicing the South Tyrol fruit-growing region.

***Amongst these is SK Südtirol (Variety Innovation Consortium – South Tyrol) headed by Kurt Wurth – this organisation is equivalent to and carries out a similar function to APFIP.***

Also based there is the headquarters of VOG an organisation formed by the union of 23 Co-Op's. This organisation services the growers of the lower fruit-growing valley. A second organisation VIP services the growers in the upper Vinschgau Valley where the growing conditions are significantly different to the lower valley.

Almost all growers belong to a Co-Op and by strict rules can only belong to 1 Co-op.

The South Tyrol is a major apple growing region of Europe producing in excess of 1,000,000 tonnes annually. The growers are predominately German-speaking Italians of Austrian decent – the region being annexed by the Italians at the end of the 1st World War. Most inhabitants speak Italian and German, many also speak English.

The region has political autonomy from Rome, and as such has a powerful local government that make the laws for everything except defence and taxes. This situation is a major factor in the retention of the culture and language of the regions inhabitants and an underpinning factor in the regions apple and pear production techniques.

As Italy has been a long- tanding member of the EU it has enjoyed significant economic support from that organisation. Initially this support went direct to the growers but more recently it has been channelled through the Cooperatives in an effort to improve marketing activities. A lot of this support has been used to upgrade or build new storage and/or pack-house facilities.

Fruit sales are through either Cooperative group - VOG (63%) or VIP (28%) or direct sales auction (7%)

VOG

- Association of 23 different Co-Op's comprising 5748 growers

- Covers 10,643 ha – apples and pears & 26ha of vegetables, predominantly in the Etche Valley on properties that range from 200 – 1000m above sea level.
- Apple production is approx 600,000 metric tonnes/year.
- Turn over approx €300m/yr (approx A$500m)
- Growers generally live in villages and have plots of land around the district
- Growers plots total up to 2-4 ha but may be in 5-6 separate parcels of land – some parcels of land may be <3000m²
- Parcels of land due to family history of acquisition – separation provides some geographic hail insurance but adds to costs because the time and travel costs.
- 4ha or more is considered a larger grower
- Co Op has full range of Quality Assurance certifications – HACCAP, BRC, Eurepgap, Integrated Production (IP), ISO 9001+
- All Cooperatives in the group have ISO 9001, and BRC
- 22/23 cooperatives have Eurepgap, VOG holds head certificate and 5748 growers are accredited

Cooperative does all the marketing – the growers have to focus on growing quality fruit.

*(While the cooperative system was highlighted to the tour group as the ideal way to market fruit, some growers (not spoken to directly) have expressed concern at the low returns being provided back to growers.)*

There is no longer EU support provided to Co-ops under 25,000 tonnes capacity – this has driven a lot of amalgamation and rationalisation.

General Variety mix for the VOG region (as presented)

| | |
|---|---|
| Golden Delicious | 26% |
| Gala | 19% |
| Red Delicious | 9% |
| Red Spur Delicious | 6% |
| Braeburn | 10% |
| Fuji | 10% |
| Granny Smith | 7% |
| Pink Lady | 4% |
| Rome | 3% |
| Jonagold | 2% |
| Other | 4% |

Some individual Cooperatives may have up to 80% Golden delicious

Main Markets

| | |
|---|---|
| Italy | 50% |
| Germany | 20% |
| England | |
| Scandinavia | |
| Spain | |
| Greece | |
| Eastern Europe | |

Pink Lady is clearly the most economical variety grown, but only 100,000 new trees a year are allowed. There is considerable interest in Rosy Glow, with most new plantings expected to be this selection

VIP (The Cooperative Association of Val Venosta)

- Organisation of 9 CoOP's
- Fruit grown at altitudes of 500 – 1100m above sea level
- Approx 95% of production is IP accredited, 5% organic
- <500mm of rain but ample water from alps for irrigation
- Turnover (2005) €170m (approx A$275m)
- Storage capacity in excess of 260,000 tonnes
- Supply fruit to 30 different markets. Italy and Germany are the main markets
- Golden delicious is the main variety grown – ideal for climate to produce the blushed Golden's that the European markets prefers.

Production (apples) 2005

| | |
|---|---|
| Golden Delicious | 69.8% |
| Stark Delicious | 10.0% |
| Jonagold | 6.8% |
| Gala | 4.1% |
| Idared | 1.1% |
| Pinova | 0.9% |
| Jonagored | 0.9% |
| Braeburn | 0.8% |
| Others (Fuji, Elstar, Granny Smith, Rome, Gloster etc) | 1.5% |
| Organic production (various varieties) | 4.1% |

A lot of effort is put into helping the various Co-ops work together

The fruit quality from the VIP cooperative is distinctively different to that from the VOG Co-op due to the different growing environments

*Regional Marketing*

Recently all South Tyrolean fruit has been brought under 1 geographical region marketing "brand" and trademark. This was recognised in January 2005. This trademark is on all packaging of fruit from the region


*Trademark for South Tyrolean apples*

*Promotion*

Germany – main European market - South Tyrol has a strong market image as the "Mountain Apples".
Promotion is strongly supported with a range of activities, in store merchandise and taste promotions.

*Competition*

- General philosophy – "got to be better than the competition – no matter who it is"
- Poland and Hungary were mentioned as emerging competitors
- China initially was considered a major threat but is now longer feared as much because of
  - Quality issues
  - Not well organised
  - Increasing consumption options within China
- Main southern hemisphere competitors were listed as NZ, Chile and South Africa.
- Australia was not mentioned.

*Production Systems*

- M9 (NAKB 337) accounts for 90+% of all rootstocks used
- General planting densities are 3000 –3200 trees/ha – Row width generally 3.5m
- Slender spindle is the predominate training system with trees allowed to grow to 3.5m
- Definite focus on growing fruiting wood not structural wood – more training less pruning.
- Knipbaum is the preferred nursery tree type
- Hail damage is an increasing problem – most new plantings have hail netting incorporated into the trellis support structures.
- (There is significant financial support for hail netting from the EU and the local provincial government – we were told that growers only paid for 40% of the hail netting costs)
- There are many new plantings – in last 8years – 40% of the whole area has changed to new varieties (30% in last 5yrs).
- 96% of the production is under IP (IFP)
- Organic production is stabilising because of diminished returns and quality requirements from the supermarkets

Club Varieties

- Currently only 2 club varieties grown – Pink Lady and Rubens
- Rubens is predominately grown by the CIV Cooperative group – production levels are expected to remain small with the main markets expected to be Northern Europe
- Plantings of a 3rd variety "Kanzi" (a Braeburn x Gala selection) have just begun. Kanzi has the same parentage as Jazz but is a blush selection, not striped.
- *(Various discussions throughout Europe suggest that Jazz will be grown in Europe in environments South of the Loire Valley in France and that Kanzi will be grown north of the Loire Valley)*
- Pink Lady – originally open to all growers now only existing growers of Pink Lady will have access to Rosy Glow (protect the early adopters)
- Pink Lady is considered an ideal variety for the region except for 1 major fault – the length of its growing season. In 2004 50% of the crop was frozen on the trees

*Quality and CO-OP operations*

- Strict quality controls are put in place

- Grower returns are based on actual packouts and can end up being negative for bad a line of fruit (hail issues exempted)
- VIP has up to 25 different grades – because of market options
- Not a lot of pre sizing is done pre-storage but is done pre-packing.
- Lot of upgrading of equipment has been undertaken to be able to respond to market demands for delivery of orders placed in the morning (often in another country).
- All processing fruit is handled by 1 Co-op (approx 25,000 t/yr) all other Co-op's divert their processing fruit to this Co-op
- Processing fruit is only a cost recovery operation due to low returns
- China and Poland biggest competitors
- Pre-harvest drop fruit is collected for juice processing

*SK – Variety Innovation Consortium*

Why formed

1. Advent of Club varieties, PBR, trademarks – how to coordinate all of the R&D and extension activities, CO-OP activities and marketing strategies in the region – needed to work together
2. Allows potential access to every new variety
3. Plantings based on consensus of economic potential to the region
4. Can run their own activities such as funding the Laimburg apple-breeding program.

Goal – targeted market research and network development

- New varieties can only be introduced by consensus of the various groups based on sound information, evaluation and/or research
- Nurseries are not involved in the decision making due to a conflict of interest
- World wide there are approx 50 apple breeding programs (30 in Europe alone) and 2 major nursery networks – INN (International Nursery Network) and AIGN (Associated International Group of Nurserymen)
- SK keeps an eye on everything going on – currently approx 1000 varieties or selections are under observation of some kind
- Hort Research (PREVAR) is a highly regarded breeding program

SK Sűdtirol is controlled by a "variety commission" made up of

2 researchers

2 specialised extension officers

1 representative from each COOP group

Kurt Werth

This group makes the final recommendations.

Current varieties being evaluated, introduced or near recommendation

1. Rubens – not being taken up extensively – few issues, small market
2. Diwa – Swiss variety – supported but not planted
3. Mairac – Swiss variety under evaluation – most suited to higher elevation areas
4. Kanzi – Gala x Braeburn – bicoloured apple from Belgium. Recommended for planting as club variety – some concerns on its flavour (less brix than Jazz)
5. Cameo – not recommended – due to its growing season and colour
6. Tentation – French variety – very good flavour but concerns on its appearance (very similar to a Golden Del)

*Pink Lady Performance*

- In South Tyrol only Pink Lady quality fruit is marketed, all Cripps Pink quality is sent to processing.
- Internal browning is not as big an issue as it previously was – close control of storage and harvest windows is maintained
- Fruit is easily stored for 7-8 months
- Lot of South Tyrol Pink Lady is shipped to Scandinavia
- During 2006 Pink lady fruit received 10 Euro cents/kg more than expected, other varieties received 10 Euro cents less than normal.
- South Tyrol growers like Pink Lady because they can achieve high and consistent yields on M.9, thinning is fairly consistent, good returns. Excellent fruit quality, high consumer demand and it cant be grown in Northern Europe
- Big disadvantage is the length of growing season and subsequent risk of crop losses through freezing and or frosts.

*Organic Production*

- Only about 3-4% of production and stable
- Marketing is focused through 2 small Co-op's
- Currently not enough financial incentives to adjust production techniques.
- Reduced yields and increased labour requirements are significant disincentives
- A good disease resistant variety is urgently needed
- Copper use (or over use) is a major issue
- Current lack of control of copper usage by organic growers is creating major tensions

## Co-operative Packhouse – Fruchhof Uberetsch

*General Comments*

- Recent union of 3 smaller co-operatives
- Now largest co-operative in local area
- Capacity of 40,000 tonnes
- Has 500 members producing fruit on approx 700 ha
- Major equipment upgrade in site visited, other 2 sites now being used specifically for fruit storage
- Upgrade cost approx 10million Euros – 40% provided by EU and 60% by the Co-operative
- Upgrade includes installation of robotic fruit stacking equipment and computerised "intelligent storage" facilities where no people or fork lifts need to go into cool rooms. Fruit is moved from cool room to packing line by computerised & automated transport systems (1st for apples)
- Using Weta defect sorting camera
- Investigating Near Infra Red quality assessment
- Fruit is pre-sized ex storage and pre packing.

*Hand grading lanes - Fruchhof Uberetsch Packhouse*

Main varieties handled

- Golden Delicious
- Gala strains
- Braeburn
- Pink Lady

- Growers paid and charged on pool system
- Costs are determined variety by variety and then charged /kg to each grower (irrespective of no of bins provided)
- Returns are based on grower's collective pack-outs and the season average price per variety.
- Growers paid 3x in season – all after sales commence
  - 1st payment – 20-25% of expected returns
  - 2nd payment – 20-25%
  - 3rd payment (at end of season) balance 50 – 60%
- Overall growers don't get the majority of their fruit payments until the start of the next harvest season, in the case of Gala it can be 14 months after harvest of fruit
- The highest grade standards are required for fruit going to England – max 8% variance.

## Sud Tyrol Beratungsring für Obst und Weinbau - Extension Service

### Marcus Bradlwarter – District adviser

- Service available to all growers – first started in 1957
- Generally 90% of growers subscribe to services
- Growers pay 60% of cost, local government pays the other 40% (local government has paid more in the past)
- Payment based on block size – base price & sliding price scale with increasing area
  - 100 Euro – 1st ha
  - 85 Euro – 2nd ha
  - 75 Euro – 3-5ha
- Currently has a staff of 35 specialised and casual staff
- Service structured into specialised services and 7 regional areas.
- These are (moving up the valley)
  - Unterland
  - Űberetsch

- Leifers
- Etschtal
- Burggrafonamt
- Vinschgau
- Brixen

- Services provided include
  - Development/redevelopment technical advice
  - Maturity testing
  - Field advice – personal & group
  - District field sessions in held every 2-3 weeks in growers orchards
  - Newsletters – 30 per year
  - Magazine (equivalent to Tree Fruit)
  - Winter training sessions & lectures
  - Workshops
  - Individual advice
  - – Other services (not specified)

## Grower Visit

Extension service client – not aligned with any Co-operative – all fruit sold through spot auction market

*General comments*

- Grows 4 ha fruit – 1 – 3ha parcel of land & 3 smaller parcels
- All grown on M.9 rootstocks
- Properties 250 – 350 metres above sea level – area well suited to Golden Delicious
- Varieties grown
  - Golden Delicious
  - Gala
  - Pink Lady
  - Fuji
  - Red Delicious
- All fruit sold through auction in 30-40 kg boxes (money available quickly not tied up)

- Harvests and sells on daily basis – most fruit sold to Italian and Spanish buyers
- Under Auction system – once sold to buyers/wholesalers they are responsible for all storage and packing (they take the risks)

*Issues and problems discussed in orchard*

- Apple proliferation considered a more serious issue than Fire blight
  - 2 insect vectors (psylla's)
  - Symptoms not necessarily expressed in year of infection
  - Ultimately trees have to be removed
  - Symptoms include:
    - Small fruit (can't size it)
    - Discoloured fruit
    - Growth distortions
- Burr Knots an increasing problem – leads to irregular growth and increased management problems
- Alternaria mali increasing as a problem particularly as the season progresses, hits Golden delicious, Gala and Pink Lady worst

*Intensive orchard development and management features*

- Golden Del – yield objective 70 tonnes per ha – good growing region – no frost and early flowering
- Pink Lady grown on 0.9 x 3.5m (3175 trees/ha) and picked 3 times
- Aim for a calm tree and use "long pruning" technique aiming for 20 cm of annual extension growth.
- Tree height – uses 1:1 rule (3.5m)
- Always uses "Narrow Spindle" system (= narrow Christmas tree shape)
- Leaders managed using 1 of several options
  - Crop load
  - Regalis
  - Paint ANA (2%) – must be wood 12mm or larger & paint 5cm strip
  - Cut to flat branch after harvest (avoid any spring/blossom pruning of leaders)
  - Cut back into 2-3 year old wood – never 1-yo
- When pruning always uses 3:1 rule
- Next planting will be – Rosy Glow

- Irrigation – overhead preferred (added benefit of frost control) scheduling aids (tensiometers) used
- Thins hard and early
- Works on a 2 week harvest window for each variety

**General Pest & Disease management**

**IFP principles and practices considered the normal practice – closely monitored**

**Main problems**

**Blackspot**

- Control primarily Protectant based and linked to warning service. Eradicants also used if necessary

*Codling Moth*

- 14000 of 18000 ha in region use mating disruption
- Other 4000 ha use predictive models based on degree days and hit the first generation with chlorpyrifos and follow on with insect growth regulators

*Leaf Rollers*

**Psylla's**

**Aphids**

**San Jose Scale –** use white oil – 3%, spray volume based on tree height

*Two Spotted Mite & European Red Mite*

- Use IFP principles, control based on predators Typhlodromus occidentalis and Typhlodromus pyri

*Nutritional programs*

- PH generally around 6.5 (water)
- Fertiliser use – linked to Eurepgap requirements
- Soil tests (min 1 every 5 yrs) used as guide
- Actual fertiliser applications linked to crop removal guidelines

- General program provided as:
  - 50 kg N /yr
  - 15-20 kg P /yr
  - 80 – 100 kg K /yr
  - 20 kg Mg /yr
- Leaf analysis used in problem blocks
- Extension service has network of “reference” orchards in each district which are used as general guides for each soil type
- Urea used 2-3 times during spring
- Boron also applied
- Manganese applied 1-2 times
- Zinc – applied before budburst, mixed with oil
- Calcium applications depend on variety
  - Golden Delicious 3-4 applications
  - Braeburn 6-8
  - Granny smith 3-4
  - Red Delicious 4-6
- Calcium nitrate used for first 2-3 applications then switch to Calcium Chloride

*Thinning Programs*

- Very variety and block dependant
- Fuji – biggest problem
- Available chemicals include
  - NAA / NAD
  - Carbaryl
  - Ethrel
  - ATS
  - Benzyl Adenine = Cylex

## Saturday 29th July 2006

ALDEFRUTTA the six year old and largest Berry co-operative in Europe. 300 growers supply berries to the Co-operative. 90% of the product stays in Italy and only blueberries and blackberries are exported to Austria, Germany and Spain. Strawberries are the most important berry in Trentina. Hydroponic strawberries need €2.5 /kg as the cost of production is €2.0 /kg.

Lockness is the most important blackberry while Brigetta (bred at Knoxfield Vic) is the most important blueberry variety, followed by Kuke , Berkley and Bluecrop. Touleimin (??) and Heritage are the most important raspberry varieties. Blueberries and currents are CA stored for up to 6 months.


*Berries ready for shipping from the Co-operative*

## Monday 31st July 2006

### Gruber Genetti Nursery

Gruber-Genetti Nursery grows about 1,300,000 apple trees in an area of approximately 100ha. The whole operation is 130 ha and 70 people are employed. This nursery specialises in producing Knip apple trees, and exports them across Europe. The nursery is inspected for fireblight every 2 weeks and can not be planted within 4kms of a commercial orchard.

*Apple Knip trees from Gruber Genetti nursery*

The main varieties produced by the nursery are

- Schniga
- Kiku 8
- Golden
- Red delicious

They are not producing any Pink Lady®, but access them from other nurseries.

The main rootstocks being used is M9 (NAKB 337).

### Production of Knip apple trees

The aim of the nursery is to produce a Knip tree with 12 branches that can achieve 7-8kg of fruit after planting. The nursery encourages lateral growth so that it forms buds in

the nursery. A good quality Knip tree should start feathering at 80cm from the ground. Half of the Knip trees are produced through winter grafting and half through summer budding.

Rootstocks are harvested from stoolbeds in November, dipped in fungicide and placed in the coolstore. These are then grafted and planted in Jan-May at a distance of 0.90 x 0.38m. Rootstocks with a diameter of 6mm are grafted.

Rootstocks with a larger diameter are planted (also in Jan-May) for budding, which occurs in late July. Budwood is sourced from a Co-operative (KSB) which is financed by a 10c levy on each tree. A Bolzano based board that inspects mother trees for trueness to type controls the quality of the wood. The board is made up of representatives from Laimburg Research and extension service, a fruit grower specialist and a nurseryman. Two other large nurseries and several Co-operatives are also in KSB which runs an incentive scheme per 10 000 trees produced, which adds to the rating of the nursery.

It takes one month to complete the budding. There are 46 budders employed by the nursery. The budders work as teams of four with each member having to do 1000 buds/day. In the team they rotate roles and one will cut the bud, one cleans stems and cuts rootstocks, one buds and one ties. Budders earn 60 Euro each day.

In the first year after planting the budded and grafted trees, they grow as a whip and then are cut back to 75-80cm to induce the feathers. When trees are ready for digging to be sold to growers, they have a three year old rootstock, a two year old stem and one year old feathers.

Of particular interest was the spraying regime to encourage branching on the nursery trees. B.A. (Cylex) is sprayed 7 or 8 times per season with handguns on a wide boom. The rate is 20 L. per 400 L. vat, (5ml/1 L. BA), plus wetter. Also 1 L. of Confidor is added with each alternate spray for aphids. One 400 L vat does 400,000 trees. Spraying starts with 5$^{th}$ leaf growth from Knip (80cm from ground) spraying the tip; only the top 3 or 4 leaves, at walking pace (Pressure 2 bar). Spraying is every 8 to 10 days, so for them the process is continuous. In a season 300-400L of BA is used in the nursery.

Chelated Copper (4 or 5 sprays commencing in October) is used for defoliation at 10 day intervals.

The nursery is highly mechanised and uses machines for both planting and harvesting. A four row planter can plant 100,000 plants per day and the mechanical diggers have a capacity of 36,000 trees per day each. The cutting and mulching of stocks 5cm. above the buds, with a hand cut later to clean-up.

*Machine for digging the Knip trees.*

During digging trees are graded into:

- 12 branches
- 8 branches, and

- 5 branches

In 10 hours it is expected that 12,000 plants should be graded, and this requires very skilled workers.

*Structure used to transport Knip trees after digging*

Trees are transported to the cool store, or sold directly to customers. The shed becomes the cool store and the trees are cooled to +2°. Trees are palletised for cool storage and shipment on 2m x 1m pallets with steel risers (approx. 2m) to support 2-3 pallets high. There are approximately 500 trees on each palette, however where trees are of poorer quality, 1000 will be stored on a palette. They are grouped into Bundles of 10 with main stem tied. Well trained staff lay them on the palette so as to protect the feathers from breaking. Gala can give some breakage as it is more brittle.

### Nursery Tree Costs

The Knip trees are considered to be a little more expensive than others, however the tree is ready for production when planted in the orchard, and the grower doesn't need to dedicate much time to it (as opposed to whips)

### Labour Costs

The nursery employs Polish and Czech workers. The best worker can earn 3100 Euros/month. The average worker receives about 2100 Euros per month working 12 hour days.

### Pear Orchard (south of Ferrara)

In the Po Valley we also visited an organic Abate Fetel pear orchard which was 4 years old. It was planted at 2.5 x 0.30m (13000 trees/ha) and on Quince C rootstock. The first crop was produced in the second year, and reached 20 tonnes/ha. In 2005 it produced 45 tonnes/ha and this year it was expected to produce 50 tonnes/ha.

*Abate Fetel planted on Quince C at 13000 trees/ha*

This years harvest will occur on the 10th September and the price is expected to be approximately 60 eurocents/kg for first grade fruit. From this block generally 80% of fruit is in the first grade and 20% in the 2nd grade.

The system was set up with trees placed on top of the soil and organic matter placed over the roots. The manure protects the roots from the hot and cold and also maintains water to the roots. In this area this type of system is employed by about 20-30% of the farms. It cost 60 000 Euros to set up the orchard.

There are no problems with fireblight in this orchard so far and every week someone checks for dry branches and pulls them out. The pH of the soil is 8 and they use acidic fertiliser products to keep it down, or else they can suffer lime induced chlorosis. Pear psylla is also a problem.

Each year root pruning is performed on alternating sides of the row to control vigour.

*Mulch covering the roots of the Abate Fetel trees*

*Lower density Abate Fetel*

This orchard also has less intensive Abate Fetel on Quince BA29 planted at 2.5-3m x 0.75-1m. It produces 30% less yield on the wider spacing and requires more labour to pick. The first pick is from the ground and then they pass with the platform for 2m and above. On the intensive system people can pick 250kg/hour whereas only 180-200kg/hour on the less intensive system.

Polish workers make up the majority of the labour force, and they are paid 5 Euro/hour.

## Tuesday 1st August 2006

On route to Avignon, France.

## Wednesday 2nd August 2006

**Toulemonde Nursery** – host Philippe Toulemonde.

Philippe provided a short history of StarFruits and its Pink Lady® involvement. Pink Lady® has held its price since the beginning – last year was a very bad year for the industry but Pink Lady® held up, earning the grower 1.2 euro per kg - 6 times what Gala earned.

StarFruits is looking to replace about 7% of Pink Lady® trees a year. New plantings are only Rosy Glow®, which is looking ideal for the climate in this area – hot nights of 20 to 25 degrees makes colouring difficult. Internal browning not a problem – seems that may be more for cold climates compared with Tasmania.

Now working to establish Sundowner® – again a colour problem. This year they waited for colour and lost firmness.

His nursery supplies 600,000 trees a year. Nursery buildings are fixed but all ground used is leased. Never uses land for more than one apple raising but can use land for three successive raisings of apple, peach, peach. Needs to find 10 ha of clean ground – with no orchard within 1 kilometre. So he travels in a wide radius from the shed – the plot we saw was 15 km away. Lifts the trees on site and grades at the shed.

Nursery bench grafts trees which are planted and cut (Knip Baum) at 800mm, to give growers 4-5 feathers about 400mm long. Also chip buds in the field.

All on m9 which he buys in. Pajam 1 and 2, Emla, NAKB and also PI80 ("Supporter") from Germany. Pajam 1 or NAKB used for new ground, more vigorous M9 for replant. Weed control – manual, or Surflan, or herbicide "Cent Sept".

Nursery is in high wind area, 100kph common and can be >80 days of 80 kph. Nursery trees are each supported by a metal stake **and** grown between two wires about 25mm apart and about 700mm high.

South France is windy and hot, with very little rain in Winter. So growers like less feathers and shorter than in Italy or Germany, and some prefer rods. To minimise transplant shock.

To develop feathers. Some varieties easier (Braeburn, Sundowner). Need high vigour – fertilizer and irrigation. Branching is easier if you have a big variance between day and night temperatures. Uses BA 3 times. Must irrigate3 hours once a week, nitrogen 3 times a year.

Trees cost grower about 4.75 euro for Knip and 4.5 euro for others.

Growers usually plant at 4mx1.5m (1666tph), grow trees to 4m high.

Recent demand has arisen for trees suitable for "Fruiting Wall". Tree is headed at 500mm and restricted to 2 equal leaders. Grower plants them at 3000 tph, 3.5mx1m, with V flat along the row, not across. Wall is machine pruned, 20mm from centre line in first year, 30mm second year and 4omm thereafter. Quicker production, less pruning, earlier pick, better yield.

*Phillipe Touloumende explaining his nursery tree production process*

## CTIFL Balandran (Research Station) FRANCE

Demonstration and talk was given by Vincent Mathieu

There are 45,000ha of apples grown in France. (Last winter 3,000 ha were removed). The area under apples will continue to decrease because the price for apples is poor. The price of stone fruit is good.

### CTIFL

- has a number of research stations situated across France. The head office is in Paris.
- is a private company
  - 60% …funded by public money through a levy on the sale of fruit and vegetables ie E1.8 per thousand on total sale of fresh fruit and vegetables.
  - 20% … European Union and Ministry of Agriculture
  - 20%…. Sale of product ie books, expertise etc

- is situated on 75 ha, growing peaches, apricots, cherries, apples and pears. Apple growing is the major fruit grown in south east France because the climate is better suited to apples.
- has no hail net because they turnover trees every six years. In addition there has been no hail in the district since 1992.

*Major areas of activity*

- Testing New Varieties *(rootstocks are not grown at CTIFL)*
- Tree Training
- Wind Breaks. Local trees and bushes are grown which benefit insects and birds thus decreasing pressure from aphids).
- Environmental aspects
- Quality Fruit Testing

### Post Harvest Problems

- *internal browning in apples* The age of the bearing wood is a factor.
- *codling moth* Use mating disruption and if necessary, one or two sprays for 1st generation
- *red mite* Red mites are a particular problem when there are hot temperatures in June around 30°C to 35°C. The "lazy" local preditor mites becomes active too late - in July.
- *leopard moth* Spray 3 or 4 pyrethrum sprays (We do not have this pest in Australia.)
- *loss of leader* 30 to 40 larvae per tree could kill the tree. Pyrethrum could kill the predator mites The local species is "neiosislus califorius" which is an all season mite. In the south west and north there are two local species which will not adapt to the current climate changes.

- Harvest Date Studies

*Testing Varieties of apples (*Vincent's special area of work*)*

- There is three ha of apples. Sample plots are kept to two trees per variety which gives some measure of control.
- There are three levels of testing with world wide varieties. Level two is more advanced with 50 trees per variety which improves solutions to problems
- There are comparison studies underway between Golden Delicious, Gala, Braeburn and Pink Lady®.

The 2006 climate has been too hot for apples which results in apple tree activity ceasing.

- The trees are suffering from sunburn.
- There have been many summer days where the temperature is around 30oC.
- There has also been poor rainfall. From 1st February = 64ml rain instead of 300ml.
- Water for irrigation comes from the Rhone river which is experiencing problems with dust (sediment). This is blocking micro sprinklers which cause the trees to suffer further moisture stress.
- It is the third dry year in a row and the trees, especially Fuji, are suffering.
- Climate problems are also leading to apple scab. There is little improvement in the situation because of the low relative humidity.
- There is wind all the time, up to 100k per hour.

Chemical Thinning

*Registration of New Chemicals*

Vincent is working toward the registration of BA and Etheral. The base research is being undertaken at Landeau then the techniques are being tested at CTIFL. BA registration is expected in 2007 or 2008.

The rules for the registration of new chemicals is becoming harder and harder, partly because more and more claims are being made against chemical companies and research companies when things go wrong.

*Carbaryl* - They are hoping that they can keep Carbaryl because it is efficient, the best thing in a warm season and more beneficial and useful in the environment. "**It will be most important to retain Carbaryl".** The European Union will discuss the continued use of Carbaryl in 2008.

In the past (ATS) for pip fruit was not reliable, even in wetter conditions.

Vincent suggests there are three active ingredients to be used in chemical thinning….

- NAAMide (NAD)
- NAA
- Carbaryl

**Etheral …**

Only 4 varieties are able to use Etheral, ie Gala, Fuji, Elstar and Arienne because there is a risk of over thinning. There is some work being done on post bloom use of Etheral

- Post bloom - spray 30 to 40 days after full bloom. (There is grower interest in using as a post bloom spray).

- dose is 360 ppm per ha
- spray pre bloom at pink bud stage
- spray too late and efficacy is less important
- a narrow window = 3 or 4 days
- 100 hours of hand thinning is expensive. When the price of apples is low as it was last season, growers are prepared to take the risk and spray thin.

BA -
- nothing new
- dose is 150 ppm per ha, however in the Loire Valley = 100 ppm

BA and Carbaryl
- there is a nice synergy between BA and Carbaryl
- more efficient

*NA; BA*
- good result
- 8ml or 10ml leads to quicker June drop by 1 to 10 days. This can increase crop load at given size, or size by 5 to 6 mm at same crop load.
- can overthin in temperatures over 25oC

Sunburn
- there is nothing registered for use however success is happening with an ascorbic acid spray at 3 to 4 sprays per season. (Vincent did not know the rate).

*Differing growing conditions in France*
There are differences between the north and south of France.
Bee population and fruit set is much higher in the south therefore the south requires hand thinning. In Northern France before the June drop there were between 350 to 400 fruit per cluster which is 100 less than in the south west and the Loire Valley. The reason is Southern France is more biennial bearing.

*Pruning styles*
Fruiting Wall - mostly grown in Loire Valley and South West France
- 2 long branches create a thick wall
  - 40 cm either side of a middle wire growing in a V shape along the wire
  - 3.5m in height and 3.5m between rows. This leads to good light and fruit quality.
  - originally the fruiting wall was planted for robot picking however, the robot was too expensive.
  - there are three main procedures-
    1) <u>prune in summer with hedging machine</u>
    2) cut off the low shoots
    3) cut off shoots missed by the machine

  - <u>Summer Pruning</u> takes place when shoots have 12 leaves.
    - Late summer pruning leads to too much vegetation growth.
    - In southern France pruning takes place on the last day in May.

  This is a successful method because

- winter pruning is expensive
- this method needs less staff. One person can normally prune 7 to 10 ha and can increase the acreage planted with fruit wall with no staff increase.
- looking at a metre square calculation – the average load of 20 fruit per sq metre on each side = 70 ton per tree.
- 20k per hour better picking than spindle
- has the same yield as the spindle style however colour arrives 5 to 7 days later. Vincent did not know why. *In discussion, Ron Gordon said that they had not measured the ratio of leaves. He believed that there would be more leaves on the fruit wall compared with a spindle tree. He suggested this is maybe why colour is late.*
- there are some problems with Gala missing markets but not others
- less sunburn than the spindle
- rows run south to north – gives colour
- 1st pick - at same time as spindle
- gives higher amount of fruit
- picks good starch and firmness
- gives colour in the middle of the wall
- it gives the appearance of more fruit, however is the same as spindle
- there are some big orchards >40ha
- still under research – oldest plantings are 15 years
- only developed because grower driven – need for less costly workers
- some consultants are not happy with Fruiting Wall therefore it has not progressed
- generally Sundowner® is not a good apple in Southern France because it has a low bud union and is not vigorous. This lack of vigour is accentuated in a fruit wall. Maybe Sundowner® is not suitable for the fruit wall!

*The Fruiting Wall – at* ***CTIFL Balandran (Research Station)***

*General pruning methods*

- since 20003 CTIFL have grown 2 axis on a trellis. Good results however too expensive and too complicated.

*Pruning rates of pay*

- 12 E per hour plus training
- staff come from South Africa, Algeria and Poland

However, labour and price is controlled

*Additional considerations regarding pruning*

- prune after thinning and after June drop before equinox

*Varieties*

*Pink lady®*

- expect up to 70 tonne per ha
- expecting less for 2006 than 2005 because fruit se4t is low
- 5 years of good returns

*Gala*

- currently, some are pale. On a scale of 1 to 10 would be 2
- season was late. Bloom was late. In a normal year ..10 to 12 April

*Braeburn*

- were confident re this apple in 1990's however not maximum production

Arienne is scab resistant, very fruitful. Some new plantings are underway.

*Root Stock Program*

After 4th leaf - if an apple has not reached its full potential then it will not. At that stage the root stock growth ceases and it is impossible to increase volume.

*Pink lady ® on M9 ..on the "long branch system" (Solaxe)*

- nice volume of fruit
- good size
- good and quick fruiting
- not troubled with woolly aphid
- low pruning and tie down to maintain sap flow and promote small shoots and reduce the development of suckers
- at the beginning – "heaps" of seven to eight branchlets and little by little they were reduced to one level of production.
- With this system it is easy to explain the number of fruit per square metre (five to six)

*Gala*

- little less than five to six fruit per square metre.
- there is no trouble with sunburn with the long branch system.

The "long branch system" is different to the solen system. With that you cut the top and then bend.

*Organics*
In France there is some interest in organic fruit however the customer is not prepared to pay the higher cost. Supermarkets want the same quality as for normal product. Not always possible. After some years of increased demand there is now a new stable. Organic production was 3% to 5%, now it is much lower.

## Tree training philosophy and methods in Southern France

Bruno Hucbourg, director of GRCETA (a fruit tree extension service) provided an overview about tree training philosophy and methods used in the region.

The French believe that the training of the tree is the key issue - not the shape of the tree.

The technique of training they use is MAFCOT with they have been using for 20 years. The objectives of the training system they use are:

- To favour the acrotonic habit of the tree
- To master and use growth potential
- To have good correlation between fruit production and wood production
- To adjust fruit quantity to branch potential

The ways to reach these objectives are by pruning, bending, shoot removal, thinning.

To favour tree acrotonic these methods are employed:

- Keep many shoots in the top of the tree
- Bend strong branches
- Early pruning of strong branches
- A cylindrical truck is wanted to be maintained

To use natural growth pattern the stratergy “GBL” is applied. No branches greater than 30mm. no low branches. No branches in the tractor row.

To keep a good correlation between fruit production and wood production the following techniques are used

- Bending of strong branches
- By keeping complex branches (many side shoots on main limb)
- Strategy of “EEE” used in crop management. Branch pruning, shoot removal, fruit thinning.

By following these techniques they want to get fruit size of 75mm. to achieve this the following formula is what is advised for the different varieties in the Avignon area. Gala= 4 fruit per cm2 of tree. Gs= 7 fruit per cm2. Gd= 5 fruit per cm2.

The consultant has 200 growers which he works with making up 4000ha of orchard, 50% being apple, 20% peach, 15% pear and the rest made up of apricots and prunes. The farmer pays by the year for the consultants which is semi funded by the government or province.

The apple growers in this area use the Durace River for their irrigation and electricity. The area has a Mediterranean climate which means warm nights which can cause them problems in varieties requiring colour.

There is a pest problem in this area because of its warm climate. It is possible to have three flights of codling moth a year. This is countered by the use of isomates where possible. Red mites are also a problem but less so when isomates are used for control of codling moth. The reason for this is the chemicals used to kill codling moth also kill the predator mites. One advantage they have is that black spot is not an issue because of the low rainfall in the area.

### Visit to J.P Gailet's orchard.

This orchard is a family run orchard. Paschale who was on hand to show us his orchard and his father manages the orchard.

80ha of apples and 12ha of cherries are grown. The varieties grown are as follows:

- Ellstar- just for the early market. There is no storage of this variety.
- Gala- only Brookfield and Galaxy being grown
- Golden Delicious- only being grown on old trees. There is no replanting of GD. Grown for early market.
- Braeburn- still some being grown but there is no replanting.
- Granny Smith- the strain Challenger is being grown in preference to G.S
- Pink Lady® - 10ha at moment but more plans for planting.

A note was made that Sundowner® was not being planted in the area at this stage because of colouring problems, they are having to be left on the trees too long and hence tend to be over mature. Also they can't see the point when it returns 15c a kg less than Pink Lady®.

Jazz® has been tried but are unsure of the colouring potential and also a bit of concerned over the storage and packout. Good size had been achieved though.

The blocks that were presented were Pink Lady® planted in 1996. 1869 trees/ha at a spacing of 4 x 1.5. The pruning is done by limb selection. Anything larger than 30mm is removed. Summer pruning is also done for colour and also net height. The apples are grown on the outer canopy of the tree to maximize colour.

Limb removal is done during the winter, then once flowers are set and a crop estimate is made more limbs are removed for breaking up of complex branches.

Four applications of chemical thinners are used. Twice with NAA then two more carbaryls are used. After chemical thinning a small amount of hand thinning is required, 80hours per hectare. Also a note was made that Golden Delicious were not hand thinned at all due to low price per kg. An 80-85% packout for Pink Lady® spec. apples is expected.

Also a note was made that the growers would rather invest in hail net than Extenday® at roughly the same price.

### Pear production in SE France

In South East France 90% of the pear production in South East France is William and Guyot. Guyot is harvested on the 15th July. The first pick of the orchard yielded 20t/ha. The biggest problem with pear production in France is that trees are older than 40 years old. There haven't been any new plantings as there are no new varieties. Price is also not high enough to plant a new orchard.

*Guyot pears in South East France*

The orchards are 'long pruned' which started in the early 90's to solve the problem of biennial bearing. Branches are left as long as possible with the removal some of the shoots according to the number of flowers wanted. Hand thinning occurs on these orchards when fruit is at 35mm. Labour takes approximately 700 hours/ha for orchards such as this with 150hours/ha pruning, 50-150hours/ha thinning and 300-400hours/ha picking.

Guyot can reach 40-45t/ha with 80% packout. Williams can reach 75-80t/ha. Pear psylla is a big problem. Most of the orchards are on quince rootstocks.

## Thursday 3rd August

### Centre Experimental Horticulture de Marsillargues

- The Research station services all of southern France with a total of 41 Ha of which 13 Ha is under Orchard. The main projects are chemical thinning, crop load management, crop inputs management and variety testing.
- Of the 2 million tonnes of apples produced in France, 33% are grown in the SE of France.
- The main work is done on apples, with the first Pink Lady® apples planted in 1994. They are also looking into Asparagus and Melons.
- The station was created in 1981 at the request of local growers to help compete with Spain and Portugal.

- The budget for the station is $1 million dollars of which $500K are devoted to the apple research.
- The funding for the research comes partially from the government and the rest comes from levies placed on the growers. The levies placed on the growers are collected by the government and allocated to the research stations according to the size and location of the farm. They also sell the apples from the orchard to help pay for the research.
- They are finding they have had to move into private consultancy services to stay viable.
- Each regional research station specialises in a particular segment of the apple production. This particular station specialises in chemical thinning and crop load management.
- Uses a particular tree management style known as 'Salsa', management style helps reduce tree vigour and fill the allocated space more quickly. By controlling the vigour and filling the allocated space more quickly gets the trees into production earlier thus giving a faster return on investment. Tree vigour is reduced by keeping long limbs in the tree.
- During pollination it has been concluded that hail net does not adversely effect pollination however there is an increase in the level of bee mortality. The hives are placed under the net at a rate of 4 hives per hectare.
- It has been concluded that using darker net will lower the sugar levels and reduce fruit firmness. The difference between no net and black net is 0.5 kg / square cm reduction in pressure and a reduction of 1 unit of brix with black net and 0.5 of a unit brix with white net.
- Black net is considered no good for coloured varieties like Pink Lady® which have problems with colouring.
- For Pink Lady® the blush requirement is 40%, whereas in Australia the requirements for Supermarkets are 60% blush.
- The research station is currently testing Granulosis which is a virus that is used in the control of the CM.
- The thinning chemicals used are similar to those in Australia, however instead of NAA they use NAD which is a safer product.

### CARDELL Group Pack-house

- The Cardell group have their own orchard which is 100 Ha in total with 1 manager and 8 permanent staff. The group also buy from approximately 20 other growers in the region.
- The future of Sundowner® is unsure, as the market is already quite crowded and the price of the fruit is quite low. The factors that are working in the favour of the Sundowner® is their high pack-out.
- The Cardell packing-house handle about 40K tonne, of which they pack about 11K tonne from the region, only 2,000 tonne are imported

- The main varieties that are packed from the region are Pink Lady® 2,500 tonne, Gala 2,500 tonne, 2,500 tonne Granny Smith and 2,500 tonne Elstar.

### COFRUID'OC Pack-house- Didiere Crabos

- The apple industry was developed in 1962 after there was a big frost that killed all grapes in the region.
- The region isn't coping very well though as last year alone 8% of the orchards in the region have been bulldozed.
- The COFRUID'OC group specialises in Asparagus and Apples. The three main apple varieties are Red Derrent, Granny Smith and Pink Lady®.
- The Pink Lady® variety is quite important to the SE region of France with approximately 25% of France's Pink Lady's® are grown in the SE region an 70 – 80% of the company's turnover comes from the sale of the Pink Lady® variety.
- The company sells approximately 12,000 tonnes of fruit, on top of the main varieties that were already mentioned they sell approximately 1,000 tonnes each of Golden Delicious and Gala. The company also maintains heritage varieties, which fit into niche markets. The Red Derrent is sold as an exclusive brand, Red Derrent DOC, which they have specific requirements that need to be met, this ensures a consistent quality for the consumer.
- 10% of the price growers receive for Pink Lady's® goes towards the marketing of the fruit. The French farmers have supplied the demand for Pink Lady®, however the 7% increase in production is going to new markets.
- Pink Lady® Europe charges 55 Euros per tonne of fruit sold, of which 85% goes towards the marketing of the product. Pink Lady® Europe has three segments, the Nursery, who manage / limit the supply of trees, the growers and the marketers.
- Marketing is considered the key to success and the trademarking guarantees the future of the product.

### Grower Visit – Christoph Weiss

- The grower has 40 Ha in total, of which Pink Lady® makes up 6.5 Ha, Granny Smith 11 Ha, Red Derrent 6 Ha, Gala 2 Ha, Golden Delicious 5 Ha and other varieties include Chant Éclair and Red Winter, which is a red Granny Smith sold into the Spanish market.
- The close planting system has reduced the pruning time considerably, from 100 hours / Ha down to 30 hours / Ha.
- A pruning method that is currently being used for coloured varieties, is pruning so that a chimney of light is allowed to form. To develop the chimney of light, shoots are removed from the middle of the tree.
- Endosulfan is still used up until 30 dbh for the control of WAA.

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## Tour Participants

| | | |
|---|---|---|
| Ian Armour | Gippsland | Producer |
| Helene Armour | Gippsland | Producer |
| Peter Darley | Orange | Producer |
| Julie Darley | Orange | Producer |
| Paul James | Adelaide Hills | Tech. advisor SARDI |
| Ian Daynes | Adelaide Hills | Tech. advisor Lenswood Co-op |
| Brian Harris | Adelaide Hills | Producer |
| Stephen Mason | Adelaide Hills | Producer |
| Richard Hawke | Yarra Valley | Producer |
| Damon Nicol | Adelaide Hills | Producer |
| Peter Henchman | Bilpin | Producer |
| Christine Henchman | Bilpin | Producer |
| Paul Mason | Adelaide Hills | Producer |
| Tim Vickers | Adelaide Hills | Producer |
| Gavin Plummer | Adelaide Hills | Producer |
| Anthony Plummer | Adelaide Hills | Producer |
| Glenn Staples | Mornington Peninsular | Producer |
| Michael Staples | Mornington Peninsular | Producer |
| Alan Upton | Yarra Valley | Producer |
| Jennifer Upton | Yarra Valley | Producer |
| Ron Gordon | Batlow | Tech. advisor Batlow Co-op |
| Angie Grills | Goulburn Valley | Tech. advisor DPI Vic |
| Tony Russell | APAL | Tour organiser |

## Itinerary

SATURDAY 22ND JULY 2006

1.20pm Arrive Zurich

SUNDAY 23RD JULY 2006 - Switzerland

08:30am Depart hotel - technical visit
09:00am Visit of apple, pear and cherry orchards with rain covers Mr. Elliker - Steinmaur
11:00am Visit to the packing station of CH Füglister AG.
Welcome by Mr. Bruno Pezzatti, President of the Swiss Fruit Growers Association
"Introduction to the national fruit production in Switzerland"

MONDAY 24TH JULY 2006 – Switzerland / Bodensee

09.30am Guttingen Research Station
3.00pm Packhouse visit – Salem Frucht Groβmarkt, (88682 Salem-Neufrach)
4.00pm Visit to a modern fruit farm managed by Thoma Löhle (88690 Uhldingen-Muehlhofen)
- High Density Plantings
- Hail coverage
- Kiku® production (3rd leaf)

5.30 pm Visit of a distillery, run by Walter Gutemann in the village of Hagnau - Welcome by the Vice-Chairman of the Obst vom Bodensee Grower Association, Mr. Erich Röhrenbach

TUESDAY 25TH JULY 2006 – Bodensee

09.00am Visit to research station (Kompetenzzentrum Obsbau Bodensee) KOB, Bavendorf
1.30pm Visit to apple orchards in the area on semi-dwarf rootstocks
Accompanied by Michael Weber and Werner Baumann (technician)
- pruning technique´s
- mechanical fruit thinning
- tree quality
- variety range

WEDNESDAY 26TH JULY 2006 – South Tirol

08.00am Travel to Laas (Upper Vinchgau Valley) - meet with Rudi Gartner – orchard visit in Vinschgau Valley
4.30pm Travel on to Bolzano

THURSDAY 27TH JULY 2006 – South Tirol

09.00am Laimburg Research Station
2.00pm Visit to Kiku - Dr. Jurgen Braun Orchard visit

FRIDAY 28TH JULY 2006 – South Tirol

09.00am Visit to “House of Apple”, Terlan - Kurt Werth
Cooperative Packhouse visit
1.00pm Marcus Bradlwarter- Orchard visits

SATURDAY 29TH JULY 2006 – South Tirol

10.00am Visit to berry pack house at Pergine

SUNDAY 30TH JULY 2006 … Free Day

MONDAY 31ST JULY 2006 – Po Valley

08.30am Nursery visit in Po Valley – Gruber Genetti
11.30am Pear orchard visit south of Ferrara
5.00 pm Depart and travel to San Remo

Stopover at San Remo (en route to Avignon, France)

TUESDAY 1ST AUGUST 2006 - Southern France

12.00 Visit French Supermarket – Geant, Aix-en-Provence
1.00pm Visit to Farm input supplier, Provence
5.00pm Arrive Avignon

WEDNESDAY 2ND AUGUST 2006 - Southern France

08.00am Visit to Toulemonde Nurseries
10.00am CTIFL Balandran (research station on apples, pears, and other fruits)
2.30pm M.Gailet's apples orchard
4.30pm M. Meyer's pear orchard
5.30pm Depart for AZ Méditerranée
(packing shed dealing with apple, pears and other fruits)

THURSDAY 3RD AUGUST 2006 - Southern France

8.30am Centre expérimental Horticole de Marsillargues (research station specializing in apples)

10.40am CARDELL EXPORT (packing facilities - apples)

and Mas de Mourgues (apples orchard) M. Yves L'HOTE

2.30pm Depart for COFRUID'OC
2.30pm COFRUID'OC (packing facilities – apples)
4.00pm M. Nougaillac's apples orchard (under hailnet)
M. Schar Weiss’ high density apples orchard Mas de Catahagène,

FRIDAY 4TH AUGUST 2006 - Paris

07.30am Check out and depart for Avignon train station

09.25am TGV departs from Avignon for Paris
12.12pm TGV arrives at Paris Gare de Lyon

Free time in Paris

6.30pm Farewell Dinner

SATURDAY 5TH AUGUST 2006

3.30pm Tour departures

## Information Dissemination from this Study Tour

The primary dissemination of information from this study tour will be through print media (including the industry magazine TreeFruit) as well as presentations at grower meetings. Publication of extracts from this detailed report commenced in TreeFruit Magazine in the October 2006 issue. As at the date of finalizing this report presentation have been provided to grower groups in the Adelaide Hills, Stanthorpe and Orange districts. Further meetings are planned.