

## Future Orchards Article for the Australian Fruitgrower December 2012

### PEARS ~ Travel broadens the mind!

by Steve Spark  
Horticultural Consultant, AgFirst

In some areas one might think that not much has changed in the pear industry over the years. Older pear plantings still make up most of the established pear production in Australia. The vast majority of the pear varieties are over a hundred years old. In the meantime, apple development and variety choice seems to have raced ahead with modern high density planted orchards appearing everywhere. It's not hard to think that pears have missed out on all the innovation that has engulfed the apple industry. Have pears really flown under the "innovation radar" and missed out on all the latest technological advancements that have been made in apples? To me, the answer is no and those growers who have travelled would also say no.

"Plant pears for your heirs" was one of the first phrases I was introduced to when I started working as an advisor some three decades ago. Not anymore. Pear innovation has quietly gone forward for those interested enough to look for it. Travel has helped many Australian growers learn new ideas and implement new planting systems. The Australian pipfruit industry has certainly benefited from encouraging growers to travel overseas to learn new and innovative practises. And travelling is always worthwhile if you have an open mind and ask the right questions.



Super spindle pear trees

In this article I would like to share some innovative pear production systems that some Australian growers have been fortunate enough to see by travelling overseas. The first three examples come from the successful 2008 APAL European grower tour organised by Alma Reynolds. Twenty eight growers took part in this tour which started in Italy and concluded in Belgium.

The first example of innovative pear production was a super spindle production system where pear trees were planted anywhere from

5000-7500 trees per hectare. Row spacing ranged from 2.7-3.0 metres and trees 30-80cm apart. Some blocks utilised twin stems to save on tree cost and to better control tree vigour. Trees in the super spindle system were often planted late to reduce shoot growth and to encourage early flower bud development.

Planting trees at these high densities is geared around achieving early production of around 60t/ha in year three. Truly amazing, since most traditional pear plantings take a lot longer to reach this yield. Of course these planting densities come with their own problems; the high cost of establishment and how to control tree vigour in a light cropping year. Good pollination and frost control are critical to make this system work



Twin stem super spindle pear trees  
30cm apart

long term. I wonder how these blocks fared this year when it was reported many European pipfruit growing areas suffered big fruit production losses from frosts. But then, most systems have their drawbacks, if risk is not managed properly.



Dutch V trellis with table top

The next example of innovation came from the Dutch V trellis with a modified table top system. Growing pears on a V trellis is not new to Australians. However the Dutch V trellis involves growing four leaders up a V trellis and, to assist with increasing early fruit production, four or five additional lower branches are trained horizontally onto wires underneath the trellis at about 1.2m, forming a table top appearance. Most fruiting wood is less than three years old and renewal pruning systems are mostly followed. Fruit production on spurs was discouraged as spur quality quickly deteriorated from excessive shading as the trees get older. Many of these blocks observed had strong vigour in the centre of the V trellis and controlling this was proving costly. Fruit tonnage were reported around 50 tonnes per hectare with the better blocks producing closer to 60 t/ha. This system was reasonably labour intensive and because of the increased vigour from renewal pruning and keeping the tree in shape, fruit storage disorders were evident in some varieties.

The third example of a high producing pear orchard in Belgium incorporated a more traditional growing system. The trees were at a tree spacing of five metres by three metres and were very tall by European standards, up to four metres high. What was interesting was this grower was considered by the tour consultant to be one of the most successful pear growers in that region and his traditional orchard constantly achieved yields of 60 tonne per hectare most years. He considered these larger trees to be less affected by frosts compared to the smaller, more intensive dwarfing type trees. This grower did not use the renewal pruning system like so many of his fellow growers, but instead preferred to



Inside the Dutch V trellis can be messy

use a long pruning regime that promoted fruiting on spurs.



Older traditional pear trees

To help him with these taller pear trees he utilised a self-propelled mobile platform that could raise and lower to any height required. This simple technology helped him overcome the handicap of such large trees. Another feature of this orchard was that the grower felt his use of spur pruning had helped his orchard to rarely suffer from biennial bearing which had been frequently observed in other intensive orcharding systems.

In 2011 at a Future Orchards presentation in Shepperton, I was interested to learn from an Australian pear grower who also uses spur pruning in his pear trees and was achieving similar results to those we saw in Belgium. Pear production for him was more consistent from year to year and easier than using renewal pruning. What we know about spur pruning is to keep spurs in the light with long pruning techniques. Spurs also require careful pruning to thin the spurs as the numbers increase overtime. This will be covered in more detail at a future Focus orchard presentation.

Another opportunity for Australian growers to travel and see pear innovation was a lot closer to home and involved less travel. Michael Crisera of Fruit Growers Victoria organised a short tour to New Zealand in February 2011 (same day as the Christchurch earthquake) for a dozen dedicated Shepperton apple and pear growers.

Modern plantings in Nelson are mostly in the newer varieties. Angelys pear is a new club variety that has been introduced into New Zealand from Europe. Several growers had taken up the opportunity to grow this variety and did not want the old pear saying of “plant pears for your heirs” to come true.



Modern Angelys semi-intensive pear orchard in Nelson

Planting densities of 3.5m row spacing and 1.5m between trees (or approximately 2000 trees per hectare) on Quince C rootstocks were mostly used. Most of these newer plantings have adopted a semi-intensive, free-standing planting system similar to those used in apples. Pear tree growth was fast tracked with ample water and nutrition. Early fruit production was sacrificed as the aim was to fill the allotted tree space as quickly as possible. Flower and fruit thinners such as Ammonium Thiosulphate (ATS) and Benzyladenine (BA) were used to reduce fruit numbers early on and lessen the risk from biennial bearing. To date these plantings have proved very successful and early tonnages in year three range from 38-45 tonnes/ha, year four 55-60 t/ha and year five 70 t/ha.



Figure 7: Lower branches trained on horizontal wires for support

A subtle variation to these intensive free-standing pear planting systems was to include a table top type horizontal wire structure in the bottom of the tree so that young branches could be supported and cropped heavier in the early years. Fruit quality was also improved as there is less limb and branch rub marks on the fruit from these supported branches. Fruit is thinned harder in the tops of the trees where the branches are smaller and less able to support excessive fruit numbers. The disadvantage of these horizontal wires in the bottom of the trees is that it makes ladder access into the tree difficult. However, mobile platforms and Hydra ladders have overcome this. Long pruning and spur cropping are an integral part in both these growing systems.



Figure 8: 2D system for growing pears on 8 wires

The next orchard the growers saw was a 2D pear orchard based on a similar concept to that used for apples. Pears are grown on branches trained down to eight horizontal wires in a fence like system. 2D trees have to date proven easy to manage and early fruit production has increased as all branches are supported. This system isn't for everyone, but those growers, in either apple or pears, who have mastered it, are achieving very satisfying results. Future vigour control strategies will become important. However this is no different than most intensive pear growing systems. Root pruning and summer tree management, along with prudent nutritional and irrigation management should assist keeping these trees calm and under control. So will consistent crops, which these systems can deliver.

Perhaps the most innovative pear growing system the growers saw, which is still in its infancy, is a modified 2D system. The modified 2D system came about because an enthusiastic Nelson grower had learned from his earlier orcharding experiences that before big tonnages of fruit can be produced, you must first grow a tree worthy of such yields. After planting, these pear trees had minimal cutting so that they grew as many



2D pears growing on 13 wires

branches and leaves as possible to help promote faster tree growth. Nutrition, irrigation, weed and pest control were optimised to ensure nothing limited tree growth early on. At the end of the first growing season, instead of removing surplus branches, as originally intended, this grower wanted to utilise as many of the branches as possible. To do this he decided to train as many branches as possible onto horizontal wires. In a traditional 2D system, eight wires are spaced evenly in a single vertical wall. In this modified system, five of the lower wires are doubled by adding another parallel wire 30cm apart. Now there are five double wires in the bottom of the tree and three single wires in the top. The total number of wires is now 13 and this has increased the fruiting wood area by nearly 40%.



View along one tier of the modified 13 wire 2D pear system. Note two wires are 30 cm apart and full of fruit.

Both Packham Triumph and Winter Nellis varieties are growing and performing well on this system. He wanted to utilise the trees' vigour and turn that into fruit. To date he has been very successful. In year three, this block produced 55t/ha. His expectation is 100t/ha in year 5. Not bad considering he is also aiming for a larger fruit size around 200 gms.

This system costs more to establish because of the extra labour to train down the one year old shoots onto the wires. But this has been repaid by the increased production. This is a lesson most growers have heeded at one time or another: "sometimes it costs more to produce more". The end results



are very pleasing and as the canopy continues to develop in the top of the structure, yields are expected to increase towards his 100 t/ha goal.

How long this system, or any of the other systems, can continue to perform will depend on many factors. To learn the answer to this, you might have to travel to find out. I am sure that those Australian growers who have travelled to look at new and innovative ideas have been well rewarded for their efforts. Pear innovation is alive and well, sometimes you just need to go out and look for it.



Funded By:

