



# APPLES FOR THE TEACHERS



Trained teachers turned orchardists; Cedric and Jenny Leathbridge are putting a new perspective on the fruits of knowledge.

They regularly run class tours through their 10ha property, Bilpin Springs Orchard, in the Hawkesbury Valley's Blue Mountain region.



*Photo by Mary Canning*



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Visiting students see practical applications of mathematics, physics and biology amid the crops of Fuji, pink lady, gala and Jonathon apples, peaches, plums, nashi pears, figs, persimmon and blueberries.

The Leathbridges bought the established property, 22 years ago and run 4ha under fruit as what is thought to be the region's first pick-your-own operation.

It now operates exclusively as pick-your-own, with a range of fruit available for harvest between January and June.

The shift was necessitated by market forces, Cedric explained. "Traditionally, orchards in the Bilpin area sold into the Sydney market. Fruit from Bilpin ripened two weeks earlier than other fruit growing areas and farmers received a premium for their product," he said.

"However, agents took a large percentage of the sales and were demanding longer runs of fruit," he said. "Interstate transport began bringing apples from early districts in Western Australia and Queensland and chilled storage facilities improved. This meant we were competing with the previous season's fruit. It became even harder for small fruit growers to remain competitive."

"People asked to pick the fruit and paid almost as much as retail prices for the fruit," Cedric said. "It didn't take long to do the sums and realise it was better to move into the pick-your-own business."

The transition has required changing fruit varieties so that there is a steady supply of fruit available over a five to six month picking season.

Changing varieties requires a five-year time lead, so decisions have to be made well in advance.

The market drives change with the introduction of sweeter apples and persimmon and Cedric has noticed climate change is affecting farm decisions, with new varieties requiring less chill for fruit set than the fruit they had traditionally grown.

The farm sits in a north-facing shallow bowl. Rainwater is collected in a large dam, big enough to supply the property for about a year.

The Bilpin region receives the bulk of its annual average 801mm rainfall in February and early March, leaving fruit vulnerable to storm damage and disease.

Cedric said that, despite of the huge losses that can occur due to rain and hail damage, the pick-your-own customers are more understanding than the general market and are more likely to purchase second-grade or damaged fruit which leads to less wastage.

The soil on the property is “not so good”, he said, being a mixture of sandstone, shale and clay.

Fallen fruit is composted into fertiliser and a small amount of commercial fertiliser is applied every two or three years.

In addition to using soil testing results, Cedric looks at the trees and more particularly the fruit, to gain an understanding of the soil requirements. The effects of soil nutrient deficiencies on fruit are clearly documented and an experienced eye soon recognises the reason fruit looks unhealthy.

While the property is not organic, he aims to keep the use of insecticides to a minimum. Integrated pest management techniques are used to reduce the use of insecticides while managing pest populations at an acceptable level.



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Predatory mites are released to control crop damaging mites and pheromone ties are used to disrupt the mating cycle of codling moth. Traps are also used to monitor fruit flies and indicate when a problem may be occurring that needs further action.

Cedric also monitors temperature, hours of light and wetness to determine when insect, mould or fungus problems are likely to occur or require treatment.

Pruning the orchard takes two to three months over winter. Apples are naturally biennial, producing a heavy crop one year and a lighter one the next. Hand thinning the blossom in spring ensures a balanced crop.

Cedric operates the farm largely as a one-man operation, with help on the weekends during the picking season. Cedric could use more labour, but is unable to justify the expense financially.

Education is still a major focus in their lives. The farm is aligned with several schools that bring classes on farm visits. Cedric hopes to expand the education program for older students to show how maths and science have practical use on-farm and make “science come to life”.

“It is such an integrated occupation, and I feed people. It is incredibly satisfying,” he said.

## SOME FARM SNAPSHOTS:

### **The farm**

- A tiny orchard – just 4 ha of fruit trees on 10 ha at Bilpin in the Blue Mountains 92 km from the CBD of Sydney.
- Surrounded on two sides by National Park at 605 m above sea level
- A family farm with one person doing the day to day operations, aided by occasional contract labour.

### **Market**

Following diverse methods of marketing, including Flemington Markets, sales have been exclusively ‘pick-your-own’ for many years, relying on their proximity to Sydney. Apart from the experience of picking fruit there is no value adding.

### **Plantings**

- Tree age ranges from 80 years to 1 season.
- No of older trees growing per ha (due to their size) = 275
- No of new plantings per ha = up to 2600
- Various types of trellis provide support for trees on dwarfing rootstocks, and keep fruit near the ground for picking.

### **Fruit Season**

- Apples and Nashi (pear) - from mid-January to June
- Late peaches and plums - from February to March.

### **Production level**

- Estimated achievable yield is 35 tonne per hectare for apples. However ‘pick-your-own’ dramatically reduces yield quantity
- Currently 50% of 3000 plants are too young to bear fruit.

### **Climate**

- Bilpin chill hours vary from 650 to 1000 and most apple varieties need at least 750 hours to be premium.
- Stone fruit usually doesn’t need very cold winter temperatures, but apples need lots of hours below 7 degrees.
- Rainfall is distributed throughout the year but mostly in summer with 960mm the 100 year median.
- Bilpin has a long growing season for apples, enabling it to grow late varieties, but maturity is often ahead of other districts, providing a market niche. Stone fruit is generally later than coastal areas.

## **Soil**

- Shale forms a clay soil suitable for fruit trees along Bells Line of Road. Away from the ridge sandstone predominates and it is retained as remnant bush.
- Lime, gypsum and dolomite are used to adjust soil pH levels (typically around 5.5) identified by soil analysis.
- Soil carbon is a minimum of 4% and difficult to improve but this is sufficient for growing healthy apples.
- To improve soil carbon, grass from the sward is thrown under the trees by the mower as mulch.
- Fertilizer requirements are determined by leaf analysis and plant observation and used only as required. Fallen fruit leaves and smaller prunings are returned to the soil by mulching.
- Soil is held together by a good ground cover of grasses which minimises soil erosion.

## **Water**

- Water is purely run-off from rain gravity fed into a 7 Mega litre dam. Water from the dam is able to support the orchard for almost a season in drought.
- Under-tree micro jets or drip line efficiently irrigate each plant and can be used for fertigation.
- Soil moisture is monitored throughout the area by a portable probe measuring water available to the roots at 4 depths below the surface. This indicates when to irrigate.

## **Pest and disease control**

- To ensure we can supply the varieties customers enjoy coupled with the timing of our rainfall periods generally means fungicides need to be used early in the season.
- Insecticides are rarely used. This is achieved by monitoring pest levels, encouraging favourable organisms, introducing predators, utilizing mating disruption and the like.

## **Pollination**

- Feral and native bees usually provide sufficient pollination. Some fruit is left on the trees for birds to peck, providing sugars for bees. To assist this winter and spring flowers are not mowed until the trees start flowering.

## **Environmental**

Frogs and birds, especially small birds, and other wildlife are in abundance and invasive weeds are kept in check.

## **Seasonal activities**

- Trees are pruned in winter.
- Winter is also tree planting season.
- In spring the crop load is adjusted (thinning) and tree shape further trained.
- Fruit is picked over summer and autumn, fertilizers applied, and maintenance work done.

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*The Archibull Prize would like to thank Mary Canning for allowing us to use some of her magnificent photographs. See more of her amazing work at [www.marycanning.com](http://www.marycanning.com)*