

Small-scale apple juice production

Following a workshop on apple growing in 2010, a small group in West Wales started working together to produce apple juice and cider. David Frost draws on the group's experience to discuss small-scale juice production.

Many growers have planted or inherited fruit trees and in a good year even neglected apple trees can produce an abundance of fruit. Marketing can be difficult because of size, shape and skin-finish requirements. Pressing the fruit for juice is a good option.

Our project started with three of us sharing our apple harvest. Over the years, the group has grown with most people contributing apples and/or joining in pressing and bottling, but some growers just make use of the facilities and keep their own juice. From the outset the only costs have been expenditure on equipment. Apart from that no cash is involved; we simply contribute fruit and/or labour in return for juice.

At first we used a press that the Herefordshire apple grower Ian Pardoe found for me years earlier. This venerable machine is a combined press and scrapper (which mills the apples) but by the end of year two it was time to upgrade and we invested in a 40-litre rack and cloth press from Vigo. As the new one is solely a press we still use the old one for scragging. All our production is manual. Electric mills are available, which could improve the speed of the operation, and a further step up would be a 100 litre hydraulic press.



Our first press



Scragged apples (above) and Rack and cloth press (right)



Apple juice may taste best straight from the press, but in order to store juice and to avoid problems such as patulin, pasteurisation is essential. Patulin, a toxic fungal metabolite, occurs in mouldy apples. If found in apple juice, it's a significant problem but it's not usually found in cider. We pasteurise juice as soon as it's bottled. The temperature is set at 75 degrees C and the 70cl glass bottles (or plastic bags for boxed juice) are held at this temperature for 25 minutes. It then keeps for up to twelve months. The longer the pasteurising period, the longer the juice can be stored but then there is an associated loss of flavour.

Although there are excellent single-variety juices, it's hard for the non-specialist orchardist to have enough fruit of any one suitable variety. In our group, during a season lasting from August till November, we have a number of varieties including Discovery, Worcester's, Bramley, local Welsh varieties, and Wagener. From our trees here at Tynyrhelyg, we press Greensleeves, Claygate Pearmain, Egremont Russet, Bramley and our own chance seedling, a tree we've named Juicy Frost because it presses so well.

We aim to produce as much juice as possible with the best flavour and we experiment with blends of sharp cooking apples and sweet eating varieties. Although many catalogues list varieties as 'good for juicing' there isn't much hard information available on the subject.

However, a study in the Netherlands evaluated 18 apple varieties organoleptically and found large differences in aroma and taste. The researchers concluded that the sugar to acid ratio, rather than total acid or total sugar content, was most important in determining whether a juice was very sour or very sweet. No surprise then that Bramley, which scores high for acidity, makes the perfect variety to blend with sweeter varieties. As two of our founder members, Sarah Holgate and Carolyn Wachter had seemingly inexhaustible supplies of (putative) Bramleys; our original quest was for sufficient sweet apples to balance their sharpness. Only latterly have I realised it's the acidity of the Bramley, balancing the cloying sweetness of dessert apples, that gives the depth of flavour needed for the finest blends.

Much more information is available on juice yield and this varies depending on, inter alia, the kind of press used, the variety of apple and the rootstock it's grown on. A guide is that 2.5kg of apples produces 1 litre of juice. Looking at the records, it would appear that we've regularly achieved higher yields than this. The best was



Bottling juice



Pasteurising bottled juice

Photos: David Frost

from a mixture of Discovery and Bramley apples in 2014 where, on average, it took only 1.8kg of apples to produce each litre of juice.

Our experience is that weather conditions - notably rainfall- also affect the dry-matter content of fruit and the yield of juice per kilo of apples. This is confirmed by Chris Firth and HDRA who researched organic top fruit production for Defra. They found that weather patterns caused variations in yield directly and also indirectly through their influence on pest and disease levels.

The HDRA study also found that where fruit was processed into juice and bottled on the farm, it proved a valuable way of maintaining total farm income. In our group, most juice and cider is for home consumption though some do sell their juice - for example as part of their tourism enterprises. For many growers with existing trees, juicing is a low-cost enterprise to set up but labour-intensive to operate; and (a note of caution) labour is most needed during the peak harvest period for growers - though apples can be stored or frozen for juicing at less busy times of the year. Apart from farm tourism, best returns from apple juice are likely to come from direct sales at market stalls and from box schemes.

And once they've tried grower-pressed juice from organically grown apples, nothing else will do.

David Frost

Notes and further information

Good varieties to plant are Bramley and Egremont Russet - two dependable varieties that store well. The advantage of Russet is its skin - a real deterrent to pecking by birds and attack by wasps. Minimising insect and bird damage to apples can help prevent mould infection and patulin production before harvest.

Poll, L. et al (1981) "Evaluation of 18 apple varieties for their suitability for juice production" Journal of the Science of Food and Agriculture 32 (11) : 1081 - 1090 · November 1981

HDRA (2005) Economics of Organic Top Fruit Production. Report to Defra OF0305

Apple press suppliers:

<https://www.happyvalleyranch.com>

<http://www.vigopresses.co.uk>

For information on patulin:

<http://www.foodsafetywatch.org/factsheets/patulin/>

For yields and general information:

<https://www.orangepippintrees.co.uk/articles/apple-juice>

www.blackberrylane.co.uk
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Me and my plough

My favourite implement is my plough. It is a three-furrow reversible Lemken and is over forty years old. It has long curved semi digger mouldboards which means I can bury surface trash or a grass/clover ley with relative ease and still only plough about 6 to 8 inches deep. Attached to my nominally 75HP Massey in our fen soil, I can cover a lot of land quite quickly. In fact tractor and plough are really well matched and seem to pull straighter when I don't interfere.

I have had it now for about fifteen years and spent a number of years before that, trying to track a plough like this down. In Cambridge we are blessed with one of the biggest Second hand Machinery Sales venues in Europe and it was on one of my many visits to it that I bumped into a neighbouring farmer that I have known since childhood. He told me he had one down the neighbouring fen in an old fallen down barn and said I was welcome to take a look. So I did, under the brambles and bits of corrugated iron was this plough. He let me have it for £150. I had to replace a fair amount of the wearing parts but it still worked out cheap. I have had to replace the ram, which I did with a second hand one off an old beet harvester and the depth wheel is now a wheel off an old planter. I have had old farm workers recognise this plough and tell me how they had used it in the past (it once belonged to a large local contractor). Ploughs seem to be a bit unfashionable at the moment, and I feel a bit of a Jeremy Clarkson going on about mine, but I love ploughing and the sound of the mouldboard cutting into the soil and the smell of the fen dirt that emanates from the freshly turned sod is something that I will never give up.



Paul Robinson

Waterland Organics (See profile in OG39)