



How not to grow fruit trees

*The story of an orchard's battle
against adversity and man's
stupidity*

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Figure 1- The orchard looking North, August 2010

How not to grow fruit trees

The story of an orchard's battle against adversity and man's stupidity

In 2007, for reasons that I don't fully recall (but perhaps under the influence of a glass of cider), I decided to plant a small orchard in North Cumbria. I reckoned that about 60 trees on semi-dwarf stock should supply me with adequate fruit plus a surplus for juicing and turning into cider. Well aware of the need for first-class planning to ensure a good result, I had already planted a random Bramley apple tree (unknown rootstock) in the chosen field and it seemed to be growing well, so I decided that this assured a successful project.

What follows illustrates how expectation and reality frequently differ and demonstrates the wisdom of the old adage that "experience is something you acquire just after you need it".

In the fashion of the best instruction manuals (but after which the resemblance ends), I have grouped my reflections into sections covering situation, soil, variety selection, planting, protection, pruning, weed control, and pests and diseases. Given the youth of my orchard, I am unable to offer advice on how to maim or otherwise mistreat older trees.

Site selection

All the experts say that the best site is on a gentle south-facing slope, well protected from the wind and no more than 400ft above sea level. In addition, certain counties are particularly favoured for apple growing, such as Kent for dessert apples and the West Country for cider apples. None of the books seem to mention the specific benefits of a site in North-West Cumbria on a North-East facing slope 650ft high (see **Error! Reference source not found.**).

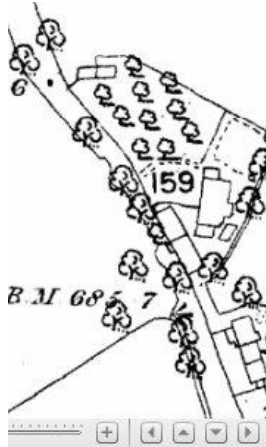


Figure 2 - 1886 map showing old orchard

However, I managed to convince myself that there would be some advantages, namely that it is well protected from the South-West winds by the slope and a shelter belt of conifers, that the Lakeland fells block the Easterly winds to some extent, that it is not a frost trap, that the sun shines on it late into the evening in summer, that it is cold in winter and last, but not least, that it is next to our garden, so it is easy to keep an eye on it. I further justified the project by saying that even if the results were poor, I would be conducting some useful research by growing a variety of fruit in difficult conditions and that this might help more people in the area take up the challenge and learn from my failures. Lastly, I have a copy of an old map showing the house with what must be an orchard next to it (where the garden now is – see Figure 2). No doubt the Victorian farmers all grew

fruit next to the house for convenience and they must have had some success even here, else why bother?

I had discussed these plans with my neighbour, a farmer who had been keeping sheep on the field I had identified as the site of the orchard, but I was nevertheless a bit surprised when he turned up one day in October 2007, with his tractor, suggesting that we ploughed some furrows to plant the trees. On the grounds that you don't argue with farmers on tractors, and that you certainly don't turn down an offer to save many hours of back-breaking work, we set to work and ploughed 10 beautifully straight rows. I had said that the intention was to plant about 60 trees, which would only have needed 5 or 6 rows, but we got a bit carried away, because the soil seemed good and was getting better with each row we ploughed (see Figure 3).



Figure 3 - Newly ploughed orchard

Soil testing and preparation

Ah, the soil. Along with site selection, everyone says that the soil is really important. I had taken this to heart and had carried out a number of tests. I checked the pH with one of those little kits that you get from the garden centres. This gave a pH of about 6. I'd dug a test hole to check drainage, which was adequate but not brilliant. Then I planted the Bramley apple tree, again from a garden centre, in the drainage test hole to see if it survived. It did, despite being knocked about by sheep and young bullocks. Also there seemed to be a good 12 inches of topsoil and some fine crops of nettles which I assumed indicated fertility. All in all the soil seemed good.

The following summer, with all the trees planted, I decided to have the soil tested professionally by the RHS. Their report came back as follows: "Soil pH: 4.7-4.9; Potassium and Magnesium: Low" and more pointedly "this soil is so acidic it will be very difficult to bring the soil up to a reasonable range within one or two years. Specialist advice should be sought if tree and soft fruits are to be grown with

any success”. Needless to say, this came as a bit of a blow. I checked the pH with a proper meter and agreed with the RHS figure. I wondered who would be able to provide specialist advice if the RHS was unable to? Most of the so-called specialist advice I could get seemed to be of the Irish variety (“...don’t start from here”). I rang the RHS and there seemed to be only two options: dig up all the trees and plough the whole field deeply with some dolomitic limestone before replanting, or top dress with lime over a number of years and hope for the best. I couldn’t face digging up all the trees, so resigned myself to applying lime every year until things improve.

Two years on, after applying lime at the rate of about 1/3rd kg per sq m each year, the pH seemed to be much the same, albeit starting to improve in the top 3 inches. By 2015 (6 inches down) it had improved to 5.7, which is more acceptable – liming is now biennial.

Selecting varieties

The intention all along was to plant mainly apples, with just a few pears and plums. The reasoning for this was that apples keep, or else can be juiced or turned into cider. Also, even I recognised that here might be a tough location for pears. I undertook some extensive research into varieties of apples and drew up a “short list” of 61 different varieties. In doing this I was greatly helped by Ian Roger, of R.V. Roger Nurseries, Peter Blackburne-Maze, Brian Gale and Hilary Wilson (who was particularly helpful as regards what might do well in Cumbria). The list was then narrowed down based on alleged suitability for the climate, disease resistance (particularly to scab and canker) and last, but not least, alleged qualities for flavour, keeping, juicing and cider. The plan to make cider was quite an important element, so a number of traditional cider apple varieties were chosen, which I am not sure has been done much before in North Cumbria! The cooking apples would be for use in cider (to give acid balance) and juice, as well as for cooking. The eventual selection and reasoning was as follows.

Annie Elizabeth	Locally grown keeping cooker.	Laxton’s Superb	Sweet dessert. Said to do well in the North.
Ashmead’s Kernel	Good flavour dessert and locally grown.	Lord Derby	Good disease resistance. (Cooker)
Belle de Boskoop	Good disease resistance and versatile.	Lord Lambourne	Generally liked and grown locally.
Bramley’s seedling	It was there already.	Major	High tannin cider apple.
Brownlee’s Russet	Good disease resistance. Said to be good flavour dessert.	Monarch	Sweet cooker which may be OK in cider too. Said to like wet conditions.
Dabinett	Bittersweet cider apple.	Newton Wonder	Sweet cooker. Good disease resistance.
D’Arcy Spice	Unique flavour dessert. Disease resistant. “Enjoys sea air”. But needs hot summer to ripen well!!	Orleans Reinette	Good disease resistance and good flavour, but needs warmth to develop!
Discovery	Early eater and juicer.	Rev. W. Wilkes	Cooker which should handle wet conditions.
Duke of Devonshire	Bred in Cumbria(ish). (Dessert)	Ribston Pippin	Good flavour. Widely grown in North.
Egremont Russet	Not Cumbrian, but someone persuaded me to grow it.	Rosemary Russet	Good disease resistance. Good flavoured dessert.
Fiesta	Recommended by a local grower. Said to be Cox-like dessert.	Scotch Bridget	Multi-purpose apple with fragrant juice. Grown widely in North-West.
Forge	Cooker which can be used in cider. Said to do well in wet regions.	Sunset	Cox-like dessert. Grown locally.

Golden Spire	Cooker which can be used in cider (AKA Tom Matthews cider apple). Said to do well in the North.	Tom Putt	Cooker and cider apple. Grown locally.
Katy	Early dessert which can be used in cider.	Tremlett's Bitter	High tannin cider apple.
Keswick Codling	Of course!	Winston	Good disease resistance. Hardy. Keeps well.
Lane's Prince Albert	Keeping cooker with good disease resistance.		

Six years on, it is clear the some varieties are doing better than others. Initially, the biggest disappointment was the Fiesta. After planting it, I read in "The Fruit Garden Displayed" that it is "prone to toxicity and canker on acid soils less than pH 6". I can testify to this. Most of my Fiesta was hit by a severe form of peeling, papery bark canker (see Figure 4).



Figure 4 - Papery bark canker on Fiesta

I applied extra lime every year and they now seem a lot better – the worst was cut right back and has re-grown strongly. By 2014, they were producing well and from a keeping and eating point of view, the stars of the orchard – beautiful Cox-like qualities, with the last apple being eaten in June 2015 (see Figure 5).

Some varieties, such as Lord Lambourne, are naturally less vigorous. Other varieties (particularly the triploid ones) are much more vigorous. This can cause

problems with wind damage (see below under "staking"). The trees with vigorous but whippy growth (i.e. more like plum) have done well and cope with wind better. Examples are Laxton's Superb, Duke of Devonshire and Dabinett. The Newton Wonder is supposed to be vigorous, but mine isn't. For some reason the Lane's Prince Albert did very well at first. This is not supposed to be a vigorous tree, but mine grew well and fruited early too! (see Figure 6).



Figure 5 - Fiesta in August 2014



Figure 6 - Lane's Prince Albert in 2010

Then, alas, it got bad canker – but it took bad management to finish it off (see “Protection” below). See the Appendix for more details on the performance of the different apple varieties. As regards the plums and pears, there wasn't half as much science in the selection – more a question of getting a variety of ripening periods, cross-pollination and some chance of coping with the conditions. I settled on a Damson (Shropshire Prune), Marjorie's seedling plum, Greengage (some hope!), Rivers' Early Prolific plum, Hesse pear, Concord, Williams Bon Chrétien, and Conference. All except for the Conference grew OK but only now are they starting to yield much fruit. The Conference had the wettest spot in the orchard, next to the beck and died from canker.

Lastly, a word about rootstocks. For the apples, I chose MM106. I didn't want dwarf trees, but I did want to be able to pick them easily (although cider apples can be shaken off). I harboured the thought that, once established, I might be able to let sheep back in the orchard to save me mowing the grass. To that end I decided to go for a half-standard form. With the benefit of hindsight (again) I might have been better to have selected a slightly more vigorous stock (such as M111) for the less vigorous varieties, or to have gone for a more intensive planting of bush trees and forget the sheep. Instead, I think that some of the trees may be a bit small to put sheep under, whereas others may need constant summer pruning to keep in check. The trouble is that most nurseries do not offer M111. Maybe the best thing would have been to have grafted them all myself...? The plums are on “St Julien A” and the pears on “Quince A”, both of which are semi-vigorous (or semi-dwarfing, depending on your point of view).

Planting and staking

Planting was greatly helped by having ploughed the furrows (5 spits wide). Nevertheless, planting over 100 trees is not to be undertaken lightly. The trees were planted into ordinary soil (no compost) with a bit of bonemeal added. Some of them were treated to a mycorrhizal fungus dip. As far as I can see this made no difference at all and was just a waste of money and time.

In planting, I think I made one good decision and two bad ones (about the best ratio I can usually hope for). The good decision was to use woven polypropylene mulch mats (“tree spats”) 18” square and pre-cut to go round the trunk. These were easy to apply and have done a great job of keeping down the weeds near the trees.

The first bad decision was to use the spiral plastic “rabbit guards”. They do keep the rabbits off, but have a number of disadvantages: they are awkward if the tree is feathered and in any case sappy feathers will grow inside them; they don't protect against deer or other large marauding beasts; and when you do take them off, the bark is more tender than if it had been left exposed. It would have been better to fence them properly.

The second bad decision was to use only canes for staking. I had thought that as they were only maiden whip plants, they wouldn't need more than a cane and a bit of bending in the wind would make them grow stronger. I hadn't reckoned that some of them would grow quite quickly, such that the roots were not well enough developed to anchor the tree in a strong wind. In retrospect, I should have put in a stout stake when I planted them, however silly it might have looked. I ended up staking them all within the first year. The standard advice, if staking after planting, is to drive the stakes in at 45 degrees, to avoid damaging the roots. This is very hard work. It also means that the tree is more likely to blow against the stake causing bark damage as happened to a number of them (particularly Tom Putt and Belle de Boskoop). I have had to re-stake the trees vertically, which would have been easier and more sensible in the first place!

I had quite a bit of bother with rubber tree ties breaking – particularly in strong winds. There is nothing quite as useless as something that fails just at the moment when it needs to function most, so I replaced the ties with some stout plastic rope. This is particularly unyielding and very effective at cutting into the bark as the tree grows so you do have to remember to check them every year. Needless to say, I failed to do this and successfully managed to strangle a Katy in 2015 (see Figure 7), with the result that it produced a huge and early crop as it clearly thought it was about to die (and may be right!).



Figure 7 - Strangled Katy in 2015 after most of the early crop had fallen (note the off-colour leaves)

Protection

We have had huge numbers of rabbits in the orchard, hence the use of rabbit guards. In the first year a deer arrived and ate the top off one of the Golden Spires. To discourage them I bought one of the movement detectors that shines a light and plays the radio at them. As recommended in the instructions, I tuned it to a station with mostly human voices (Radio 4). I'm not sure it is very effective. Although we didn't see much more of the deer, I suspect they gathered round to listen to the radio at night. I had visions of going into the orchard early one morning to catch them all listening to "Farming Today".

Deciding that Radio 4 alone was probably an insufficient deterrent, I put plastic mesh fences 4ft high around every tree. This seemed easier, cheaper and less ugly than putting a big fence round the whole orchard and also meant that I could do away with the rabbit guards. There hasn't been any further damage from animals, but the fences bring their own problems in that the trees rub against them and damage the bark. If I'd put the stakes in vertically, then this would have been easily dealt with.



Figure 8 - Dead Lane's Prince Albert (2015)

I mentioned that the rabbit guards were not a good idea. Keen to follow one bad decision with an even worse one, I put them back on in spring 2012 when having trouble with voles. This was a really very bad idea, especially as I negligently left them on during the wet summer of 2012 and thus caused – I think – rot in the rootstock and lower stem of several trees. I sent off samples to the excellent RHS members' advisory service, which confirmed that the most likely cause of death was "stress". This problem finally finished off the Lane's Prince Albert that had already been weakened by canker (see Figure 8).

The only good news was that they also tested for *Phytophthora* and this test was negative. So the moral of this story is: only use a mesh guard, not a solid plastic spiral. Now that the trees have vertical stakes, the plastic mesh works well as a general-purpose guard, especially if wrapped around several times (see Figure 9).

Pruning

Pruning has probably been one of my areas of least failure, although no doubt an expert will consider that I should have cut more or differently. Before I planted this orchard, my pruning style was fairly haphazard as I tried to interpret what the books said. Trees in the field never seem to look like the ones in the books. So I did what I think was a smart thing and attended a pruning day at Acorn Bank. I learned a bit, but still found myself standing in front of a tree not quite sure what to do. Since then, I have watched and participated in a few more pruning sessions and I think the light is slowly dawning. I do think that pruning is a matter of practice, not something you can learn from books. The best advice I can offer is "try and think like a tree".



Figure 9 - Katy showing tree guard (2015)

While the deer had their own ideas about pruning the apple trees, my idea was to prune them to a half-standard. Putting the deer fences around them at 4ft high pretty much dictated this plan anyway. In the first year, the leaders were left to grow on, the plan being to reduce them the following winter to 5ft to encourage laterals. Needless to say, several

trees didn't make it to 5ft in the first year (not surprising with less vigorous varieties starting from maiden whips 2ft – 3ft high): these were left to grow on in the second year. Surplus laterals were then reduced in the following winter. From 2½ years after planting I have summer pruned the more vigorous trees, removing many leaders and cutting back unwanted growth to 2 leaves to encourage fruiting. The cider trees have had their central leaders left in place, in the traditional style (see Figure 10).

I have experimented with the “nicking and notching” approach. Having derided books on pruning, I think that this is best described in an old book I have: “Fruit Growing – Modern Cultural Methods” edited by N.B. Bagenal of East Malling Research Station. This book's first impression was in 1939 – I have the 1945 “war economy standard” edition, which is finer than many of today's books and cost then a princely sum of 30/- (about £150 now, relative to average earnings). For £10 in a Hay bookshop, I reckon it was good value! Generally it is an excellent book, although a bit out of date in its recommended use of lead arsenate etc. (it also mentions a new wonder chemical – DDT – that will be available after the war and may largely replace many existing sprays, being “non-poisonous, safe and pleasant to use, and unlikely to cause spray damage”.)



Figure 10 - Dabinett cider apple tree in 2010 with central leader (and quite a few fruit).

“Notching” is the removal of a notch just above a bud to encourage it to form a lateral. “Nicking” is applied to an upright lateral to persuade it to go outwards. The lateral is pruned one or two buds higher than the desired outward-facing bud and the higher buds are then prevented from forming strong growths by ‘nicking’ below the buds. Having used both nicking and notching, the evidence shows some success. Notching encouraged some laterals to form at the right height for the half-standard form. Nicking resulted in a number of more horizontal sub-laterals. In the latter case, in the summer I pruned back the upper (original) lateral to two leaves hoping to thereby encourage fruiting on what will be two-year old wood the next year. After this, most of the trees have well-developed laterals, so pruning has been fairly straightforward.

As regards the plum and pear trees, these were pruned fairly lightly at first (and only in the summer for plums) – just enough to remove damaged and badly placed growth. Lately (after 7 years, two of the pear trees – Hesse and Williams – have become quite vigorous and need a severe haircut in summer.

Weed control

Undoubtedly the most successful plants in the orchard are the weeds. Having ploughed some nice straight strips, it made sense to try and keep these weed-free and mow the alleys in between. In the first year this worked reasonably well but was rather expensive in glyphosate weedkiller.

In the second year I decided on a slightly different approach, sowing a green manure crop of clover in some strips, planting potatoes others and putting weedkiller on the rest. The clover was pretty but was out-competed eventually by creeping buttercup. The potatoes were excellent and untouched by the rabbits. The weedkiller worked as before but with an unpleasant side-effect in that a number of trees (mostly the Sunset – see Figure 11) were affected by spray drift. Quite why this happened is a bit unclear as there was virtually no wind when I sprayed. I can only think that, since the spray was applied shortly after taking off the rabbit guards, the bark was still fairly green and tender and thus more susceptible than otherwise (of course the previous year, the rabbit guards would have protected against spray drift). The net result was that the affected trees' leaves went yellow and they stopped growing. Thankfully they started to recover the following year.



Figure 11 - Sick Sunset after spray

Since then I have not applied any weedkiller. I have grown potatoes again (in different locations from before) and mulched with cut grass quite a lot. Otherwise I have scythed or run the mower over the worst of the weeds. The mulch mats are still working well and keeping the weeds away from the immediate vicinity of the trees. Some hand weeding is still needed.

Pests and diseases

Rabbits and deer have already been discussed and the dangers of marauding sheep and bullocks have also been mentioned, but most of the pests and diseases come in smaller packages. Thankfully, so far, insects have not been too troublesome, apart from the wasps who like to turn the Discovery apples into Chinese lanterns. Scab and canker have been a problem though, despite selecting mostly disease-resistant varieties.

As mentioned earlier, the Fiesta was hit by a “papery bark” form of canker because of the acid soil. Aside from Fiesta, it is generally the more vigorous trees that have suffered, often with cankers on the main stem necessitating some drastic pruning. The majority of a set of five Scotch Bridget trees from one particular nursery had incipient canker when they arrived and two did not survive and were replaced. Generally, so far, the canker has been dealt with by pruning. Tom Putt seems to be quite susceptible – I think its vigorous habit creates ideal conditions (soft tissue easily damaged) for canker to form – but it does seem to respond to treatment. Belle de Boskoop suffers quite badly and requires regular care.

Scab is more widespread and is a known problem with the wet weather here. Scab is also said to increase the risk of canker. I didn't take spray at all in the first two springs as I wasn't expecting much fruit, but after that I have sprayed with Systhane. Following recommendations in Michael Phillips' book “The Apple Grower” I sprayed at times when I calculated that there would be a high number of mature scab ascospores. This was done using a very nerdy spreadsheet to calculate degree days and leaf wetting and resulted in two sprayings. This does seem to reduce the scab, but not eliminate it. (I should say that Michael Phillips is an organic grower and so uses sulphur, not systhane. I have never managed to get my head around why it is OK to use inorganic chemicals as fungicides in organic growing, but never mind).

I also removed the John Downie crab apple tree from the orchard. I had planted a couple of crabs (the other being Dartmouth) to aid pollination, but the John Downie suffered terribly from scab, the leaves

eventually going black and falling off each year. It has now been banished to the (least acid part of) the garden and sprayed – it is finally recovering a bit.

Fruit

The idea in planting fruit trees is to get fruit. I tried to ignore this for the first year or two, assiduously



Figure 12 - Keswick Codlin 2010. The leader was summer-pruned out, but only down as far as the apples!

removing blossom and fruit, so as not to stress the poor trees and pruning for shape and growth rather than fruit. There were a few fruit in the second summer - 7 apples from 102 trees and none from the plum and pear trees – but as 5 were cider apples and only one was a dessert, it wasn't really possible to assess quality. In August 2010, there were over 200 apples including 45 dessert apples which formed in spite of, rather than because of, the pruning. The biggest cropper aside from the cider and crab apples was Keswick Codlin (see Figure 12) with about 20

fruit.

In 2011, the harvest was about 900 fruit. 2012 was a very poor year, but the harvest improved as the trees were still maturing. In 2013, there were over 3,000 apples. A rough estimate in 2014, which was an excellent summer, is over 7,000! The 2015 crop, after a late spring and a poor summer is about 4,500-5,000 apples. The planting pattern was designed with the intention that cropping moves in succession across the orchard, making life a bit easier as I cope with the huge weight of fruit to be picked! Inevitably, this idea already appears naïve as picking dates are much more variable than the books imply.

So far, the quality of the fruit has been quite good: the main thing to get wrong with picking apples grown in such a difficult location is to do it too early. The early apples, particularly Discovery, Katy, Golden Spire, Keswick Codlin and Tom Putt, are excellent croppers and good quality (although the Golden Spire can be a bit scabby, this is not so important in a cooker). After keeping, many of the apples developed a good flavour, however. All the Cox offspring have a fine flavour and the Fiesta is particularly good, and a good keeper too. Some of the late apples can be very good but are unreliable. See the Appendix for more details. Storage has not proved a problem for me – for once the cold location helps!

Conclusions

I hope that this brief tale may help others know what not to do when planting a new orchard. Hopefully, by turning my mistakes on their head, you can see some clues as to what you should do.

- *Location*

Live in or move to a fruit-growing area. Failing that, don't just choose a location because it is convenient. Don't be impatient. Nevertheless, I haven't yet proved that it is impossible to grow fruit trees here.

- *Soil*

Don't be impatient. Get it tested a year before you intend to plant (or plant a year later than you intended). If necessary, plough deeply incorporating all necessary lime and fertilisers.

- *Varieties*

Plant varieties known to do well in the area. Don't plant fancy late-maturing varieties like Orleans Reinette and D'Arcy Spice which only do well at the opposite end of the country, if there. (Having said that, Orleans Reinette is a lovely apple and doesn't mind the wet: it just doesn't develop the flavour that it would in a warmer climate). Don't plant scab susceptible varieties like John Downie in a wet climate (perhaps don't plant John Downie anyway – there are many prettier crab apples). Don't plant Fiesta in an acid soil (less than pH 6), but then your soil will be just right anyway...

- *Planting staking & protection*

Even if the tree looks like a twig, plant it with a nice big tree spat and a nice big stake. Don't use plastic rabbit guards; use plastic or metal mesh netting secured to the stake with some protective material on the top edge to reduce the risk of bark damage. (An excellent example of this can be seen at Middle Fell Farm, next to the Old Dungeon Ghyll Hotel in Langdale). Use the right rootstock. Consider varying the rootstock dependent on the natural vigour of the variety if you want to have trees of a consistent size.

- *Pruning*

Don't be impatient. Get some hands-on tuition. More than once.

- *Weed control, pests & diseases*

Be careful with weedkiller. Young trees have soft bark. Mulch. Use plastic. Don't be disheartened by canker: keep a careful eye out for it and cut it out as soon as you see it (disinfect tools and destroy infected wood). Young trees soon recover, even if pruned back to a short stick!

- *Fruit*

Don't be impatient (do you detect a theme here?). Remove all blossom in the first year. Only allow vigorous trees to fruit in the second year. Thin. Don't pick too early or eat too soon.

A summary of how to kill trees

Finally I offer a summary of my tried and trusted methods of killing fruit trees:

The acid bath

Simply plant your trees in soil which is far too acid.

Suffocation

Place a non-ventilated rabbit collar round your tree trunk and let the wet weather kill your tree.

Poisoning

Spray your young trees with weedkiller.

Strangulation

Tie them to the stake with a stout rope and leave them to die.

Appendix - Summary of results after 7½ years

The table below sets out my preliminary comments on the performance of the apple varieties as at September 2015. It is too early to provide meaningful analysis of the plum and pear varieties.

Bear in mind that the trees were planted as maiden whips and pruned to a half-standard shape so that they were not expected to come into fruit for 3 years. The results below only refer to those trees which were planted in the winter of 2007/8. Note that “in 6th year” refers to the summer/autumn after the trees have been planted for 5½ years – ie. 2013 .

Variety (No. of trees planted)	Actual vigour (vs expected)	Health	Early Fruiting?	Fruit quality
Discovery (2)	Moderate (Moderate)	Initially, both trees were healthy with no scab or canker. One got canker/rot in the rootstock (caused by rabbit guard?) and died.	None in 3 rd year, but some in 4 th year. Fair crop in year 5 and good crop from year 6 onwards.	Good flavour, not too much scab, but very attractive to wasps! Does not keep.
Katy (5)	Strong (Strong)	Initially, all trees were healthy with no scab or canker. Two had canker/rot in the rootstock (caused by rabbit guard?). One died but the other is recovering	Very few in 3 rd year. Fair crop in 4 th year. Good from 5 th year on.	Good condition and flavour. Keeps better than Discovery, but not beyond November.
Golden Spire (5)	Low (Low)	All trees are healthy, although leaves reflect low vigour. Rather scabby.	Fair crop in 3 rd year, with good crops from 4 th year on.	Somewhat scabby. Good flavour – slightly “cidery”. Does not drop too early from the tree, even though it is early-maturing.
Rev. W. Wilkes (1)	Moderate (Moderate)	Healthy with no scab or canker.	A few fruit in 3 rd year, none in 4 th year. A few in 5 th & 6 th years. A good crop eaten by birds in 7 th year then very little in 8 th .	Fair, but susceptible to scab. Not really worth growing.

Keswick Codlin (1)	Strong (Moderate)	Healthy with little scab and no canker.	Good crop from 3 rd year onwards.	Good condition and flavour, but does suddenly fall from the tree if not picked in time.
Tom Putt (8)	Very strong (Strong)	Healthy. Little scab, but young bark easily damaged risking canker (although it recovers well).	None in 3 rd year, but good crops from 4 th year.	Good condition. Makes a good cooker and juicer, but also a passable sharp dessert apple
Forge (2)	Moderate (Moderate)	Healthy with no canker, but a little scab.	No fruit until 6 th year.	This was sold to me as a cooker but is a passable dessert apple – very aromatic and quite sweet.
Lord Derby (1)	Strong (Strong)	Healthy with little scab and no canker.	Several fruit in 3 rd year with fair crop from 4 th year.	Good condition and flavour.
Lord Lambourne (6)	Low (Low)	Some canker & some sign of nutrient deficiency in early years. Improving vigour as they become more established.	None in 3 rd year. Good blossom in 4 th year, but poor set and much dropped. Some fruit in 5 th year with more from 6 th year.	Excellent flavour. Some scab.
Major (cider) (4)	Strong (Moderate)	Two trees entirely lost to canker (possibly bad rootstock and or problems caused by rabbit guards). Others are OK.	No fruit in 3 rd year. Fair crop on one tree only in 4 th year. Very little in year 5, more in 6 th with good crop in year 7, but less in 8 th year.	Good early cider apple.
Egremont Russet (1)	Moderate (Moderate)	Slow to establish, but now looking more healthy but with some scab.	None in 3 rd year, but one in 4 th year. Some later years, but not a great crop..	A little scab. OK flavour, but needs a good year.

Ribston Pippin (1)	Strong (Moderate)	Early summer growth sometimes appears to suffer from mildew, but recovers. Otherwise no disease.	None in 3 rd year, but some in 4 th year and good crops from year 5.	Good condition. Fresh appley flavour, but not as aromatic as some.
Fiesta (4)	Low (Low)	Acid-induced papery-bark canker mostly addressed by extra dressings of lime, although one tree had to be cut right back and is now recovering.	None in 3 rd year, but some from 4 th year. Better crops from 5 th year.	Fruit good but can be susceptible to scab in a bad year. However, it is a good size and the flavour is very good – Cox-like and quite sweet. Plus it keeps very well – until June in a good year.
Sunset (6)	Low/Moderate (Moderate)	Vigour was affected by weedkiller damage in 3 rd year, otherwise seems reasonably trouble-free.	Fair crop in 3 rd year from the one unaffected tree. Most trees bearing a good crop from 4 th year onwards.	Good condition but small. Good Cox-like flavour (very good by December). Rather scab-susceptible. Does not keep as well as Fiesta.
Annie Elizabeth (1)	Strong (Strong)	Healthy with no scab or canker.	No fruit until 6 th year and then very little.	Fruit scabby despite there being little scab on the leaves.
Duke of Devonshire (1)	Moderate/Strong (Moderate)	Fairly healthy with no canker, but some scab.	None in 3 rd year, but some from 4 th year. Good crop in year 7 (a good year).	Good condition. Very good flavour - sweet-sharp aromatic by January.
Belle de Boskoop (5)	Strong (Strong)	Bark easily damaged and frequently infected with canker, but appears to recover if treated. Some scab. One tree lost due to rot in rootstock (caused by rabbit guard?).	None in 3 rd year. Good blossom in 4 th year but very poor set and all fruit dropped. Poor 5 th year, but some fruit in year 6 with a fair crop in 7 th & 8 th years.	Said to be a dual-purpose apple, but really a cooker in Cumbria. Good flavoured large apples.

Monarch (4)	Moderate/Strong (Strong)	Damaged bark resulted in one tree with bad canker, died. Others seem fine.	Fair crop on one tree in 3 rd year. Further fair crop on all trees from 4 th year.	Excellent, especially for baking (quite sharp and fluffy). Keeps well into late winter.
Laxton's superb (2)	Strong (Strong)	Healthy with no canker although some scab.	A few fruit in 3 rd year, with good crops from 4 th year. One tree with very little in years 6 & 8 but they both cropped well in year 7.	Good condition and flavour (best in December). Some cracked fruit in 4 th year, but good crop and cox-like flavour.
Tremlett's Bitter (cider) (4)	Very strong (Strong)	Some canker in one tree, but good recovery. Otherwise no problems.	None in 3 rd year, but some cropping in 4 th year. Fair crops from 5 th year. Excellent crop in 7 th year but now seems to be going biennial (which it is known to do).	Good quality cider apple for blending with others.
Scotch Bridget (5)	Moderate (Moderate)	Two trees delivered with incipient canker died and were replaced. Otherwise, some canker but good recovery.	One apple in 3 rd year. None in 4 th year, despite good blossom. Few in 5 th year and a few more in year 6. Good crop in 7 th year.	Keeps well. Nice eater in February – crisp with a well-balanced flavour. Makes very fine juice.
Orleans Reinette (1)	Strong (Strong)	Healthy with no scab or canker.	None in 3 rd year, but fair crop in 4 th year. Small crop in year 5 (v. poor summer) but fair in year 6. Good crops after that.	Very good appearance. A cooker in Cumbria. Good sweet-sharp flavour. Excellent in tarte tatin – holds shape, but melting texture.

Ashmead's Kernel (4)	Low/Moderate (Moderate)	All trees are fairly healthy with little scab and canker. Not very vigorous for an alleged triploid.	Just a few apples from year 3 onwards. Disappointing harvest.	Good condition. Keeps well until Feb. Very good flavour - aromatic.
Rosemary Russett (5)	Moderate (Moderate)	Some canker on one tree – cut right back and recovering well. Otherwise little disease.	Very few apples until 7 th year.	Quite a good flavour and reasonable fruit quality. Keeps fairly well.
Lane's Prince Albert (1)	Moderate (Low)	Healthy with no scab or canker until 5 th year when bad canker discovered in main stem. In 6 th year suffered from low-level rot (caused by rabbit guard?). Died.	Good crops from year 3 onwards, but small apples in year 6 owing to canker.	Good condition and flavour. Keeps well until March.
D'Arcy Spice (1)	Moderate (Moderate)	Healthy with little scab and no canker.	2 apples in 3 rd year and in 4 th year. Cropped again in years 7 & 8.	Keeps well. Eaten in April: juicy and well-balanced (but not spicy even in a good Cumbrian summer).
Winston (4)	Moderate (Moderate)	All trees were healthy with no scab or canker for first 3 years. However from 4 th summer they seemed to be weakening. By year 6 2 trees appeared to be recovering and now all look a bit better. Very upright growth which is not good for cropping.	One apple in 2 nd year (i.e 2009), several in 3 rd year and a fair crop was showing for 4 th year until most dropped. None in 5 th year, but some in 6 th year. Better crops after that.	Keeps well (until May). Well balanced with a distinctive, slightly bitter flavour. Rather small, though.

Brownlee's Russet (4)	Moderate (Moderate)	Some canker, but recovered. Otherwise OK until 4 th summer, when several trees seem to be suffering from scab and nutrient deficiency. Poor in year 5 but recovering slightly in year 6.	Some fruit in 3 rd year. Fair crop was showing for 4 th year until most dropped. None in year 5, but a few in year 6. Some again in years 7 & 8, but overall a disappointing cropper.	Excellent flavour if left to mature. Keeps well until March.
Bramley's seedling (1)	Very strong (Very strong)	Healthy with little scab and no canker.	None in 3 rd year, but some from 4 th year.	Average quality and rather scabby
Dabinett (cider) (5)	Strong (Low)	All trees are healthy with little scab and no canker. However from year 5 some trees seemed to be weakening with no obvious cause. Recovered after that (applied potash).	Good crop in 3 rd and 4 th years. In 5 th and 6 th years some trees cropped well and others poorly. 7 th and 8 th years had good crops.	Very fine cider apple – clean fruit and sweet.
Newton Wonder (4)	Moderate (Strong)	All trees are healthy with no scab or canker. Smaller than expected.	One apple in 2 nd year and in 3 rd year. None in 4 th or 5 th years. One in 6 th year. A few more in 7 th year but less in 8 th so overall a poor yield so far.	Keeps well. By March was fair eater.

A few early conclusions may be drawn from these results.

Firstly, the vigour of the trees varies quite substantially. Generally the trees performed as expected. Given that they were all intended to be grown as half-standards, the less vigorous varieties might have benefited from M111 or even M25 rootstock, particularly where some signs of nutrient deficiency were apparent (e.g. Lord Lambourne). Cider apple varieties seem to be naturally more vigorous than others and were pruned more lightly, leading to a more vigorous habit than expected. Lane's Prince Albert exceeded expectations at first but was hit by canker then rot, while the Newton Wonder has sadly fallen short (possibly because it is in the least favourable spot).

Generally the early apples perform better in terms of yield. No doubt this is due at least in part to the short Cumbrian growing season.

As regards storage, it may be my imagination, but my apples do seem to keep very well – longer than similar varieties from more favourable locations – although they are a bit less sweet and need keeping longer before eating. For example, in 2010-11, my Sunset were very nice in December, when many others were going over. Also, Scotch Bridget in January looks firmer and shinier compared with those from a more favourable location. The much earlier season and milder winter of 2011 reduced keeping times. The Fiesta keep much better than expected with the 2014 crop keeping until June 2015.

Lastly, based on the results so far, these are the apples I would definitely choose to plant again:

Discovery; Katy; Golden Spire; Keswick Codlin; Tom Putt; Lord Derby; Ribston Pippin; Fiesta; Duke of Devonshire; Monarch; Laxton's Superb; Tremlett's Bitter; Scotch Bridget; Orleans Reinette; Lane's Prince Albert; Dabinett.

Figure 13 - The Orchard in September 2015

