



Planting Guide



This guide has been produced on behalf of the Welsh Perry & Cider Society
by The Green Valleys CIC.

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Introduction

This guide is for planning the creation of a new orchard. Its suitable for individual landowners but has been written with specific reference to the establishment of community orchards where planning and planting are likely undertaken by volunteers.

Choice of varieties

Choosing your species and varieties will be down to individual groups, though obtaining good advice on the suitability of a particular variety to your site is important. No written guide can really cover this but thankfully most heritage variety growers will be able to advise you on species that suit your location and the characteristics of your particular site.

The size of the site is important to consider. The rootstock used for each variety will determine the size of the mature tree, which determines how far apart they must be spaced. This of course determines how many can be planted on a particular site! Small sites or irregularly shaped sites may influence choice of rootstock to ensure that you can fit in the desired number of trees.

Site assessment

You should get to know your chosen site a little before planning your planting. Larger sites may have scope for the orchard to occupy the more favourable areas – or at least avoid less favourable areas.

Ideally check your site over the course of a year and make a note of the following things:

- What is the current ground cover? Typically, site will be grassed, but brownfield, bracken or scrub are all potential orchard sites. Look for any invasive species particularly Japanese Knotweed and Himalayan Balsam which are both common across much of Wales.
- Does the site slope – if so, how much and in which direction?
- Is it exposed to the wind?
- How far is it from the coast? Sites very close to the coast may have to contend with salt as well as wind, potential inundation with seawater, transfer of sand from active dunes or cliff erosion.

- Is there any sign that the ground has been disturbed? This can be difficult to tell but many areas have been artificially landscaped, particularly areas near housing, roads or anywhere with the potential for old mine workings i.e. much of Wales! Look out for unusually level and flat areas, very uniform slopes or banks and any breaks or changes from the surrounding land. Where ground has been landscaped, it could be that there is rock, spoil heaps or rubble that has been buried beneath a layer of soil.
- Look for any overhead or underground services. Overhead lines are obvious, and any planting should be located to avoid future interference with lines. Underground services can be more difficult to spot. Look for marker stones or manhole covers. Sometimes trenching work can leave a clear line of slightly depressed or raised ground. Urban and semi-urban areas could have water, gas or power running under greenspaces so have a look for markers and manholes on any surrounding roads and pavements. Finally, underground services checks with the relevant authorities can be made. Avoid planting over underground services.
- Do any trees, tall hedges or nearby buildings cast shade over the site? This can of course change across the day and seasons.
- Does any area get waterlogged or are there any times of standing water and surface water flows?
- Does frost linger in any hollows or shaded areas?
- Look for any potential hazards.
- Look at condition of fences, gates and stiles
- Do any Rights of Way cross the land? If unsure, check with your local authority.
- Is the site protected in any way? This could be as a Site of Special Scientific Interest SSSI, A Site of Importance for Nature Conservation SIN, A Scheduled Ancient Monument SAM, or a Special Area of Conservation SAC. Check with your local authority and some designated area can be viewed via online maps from Natural Resources Wales, or CADW. In all cases, if your land has one of these designations you must speak to the relevant authority for permission before you start.
- Finally test the soil. Soil pH testers are cheap and could help identify suitable species and varieties. Dig some trial pits (once you are sure there are no underground services or protected land designation of course!) and see how deep the soil is and whether there are signs of stone or buried material.

Planting plan

It is important to have a clear plan for the planting before you start. This is particularly true if you're organizing a day with volunteers and others come and help plant the trees! People are often keen to get stuck in so make sure you have everything ready for people to start before they arrive.

As well as locating your trees in the right area – avoiding waterlogged areas or overhead lines - it's important to ensure that your trees are spaced apart correctly. This will depend on their size when mature and this is dependent on the type of rootstock. A long tape measure is essential to check space when planning and don't forget to leave any space required for vehicle access or grass mowing.

Risk Assessment

If planting with a group of volunteers its essential to complete a Risk Assessment. This should include the hazards of the site and of the planting activity. Common hazards will include steep and slippery ground, any roads near access points and any structures on site.

Access

Plan how you will access the site. Be aware that ground conditions can change significantly. A nice firm and dry site can easily become very soft when wet making vehicle access more difficult. Think everything through and make a plan before you start. Some questions to think about include:

- Can you drive onto site in a regular car or will you need a 4X4?
- What about if the ground is wet?
- Do you need a key?
- How will you bring the trees, stakes and guards onto site?
- How will your volunteers access the site?
- Will they require parking?

Preparation

Making sure you have a good plan and are ready for all your happy planters is essential to a successful day. Plan ahead and be sure to know where each tree will be going and what spacing is required. If possible, mark out the site before most of your volunteers arrive on site and mark each tree location with a stake (Figure 1).



Figure 1: Trees have been placed out in their correct locations prior to the arrival of eager tree planters.

You may want specific varieties or species to go in specific places, for example keeping all the pears in one row. Either place out the trees next in their marked locations or ensure that you have a clear map/plan and that you have someone in charge of making sure the right tree goes to the right place.

Managing the workers

As well as preparing the site in advance, having a good plan for what you're going to ask people to do will help any volunteer planting event go smoothly. Think about who will be attending and what their expected abilities will be. Find tasks that are suitable for certain volunteers. Heavy lifting for example needs people who know proper lifting methods and have a strong back. If children are attending, consider what tasks they could do and whether they need close supervision.

All volunteer session should start with a good briefing. This should cover:

- All the safety information included in the risk assessment
- Identify who's in charge or supervising
- Go over welfare information like toilets, hand washing and first aid provision
- Instructions on the task
- How to use tools safely and keeping the worksite organized and tidy



Figure 2: Tree planting can be a popular event, especially on sunny days. Being well prepared with an organised site will help manage the tree planters.

Organising a work site

Organising your worksite ahead of a volunteer day is essential. Think about:

- Access and parking
- Storage of trees, stakes, guards and tools (Figure 3)
- Location of first aid kit or welfare facilities
- A place for participants to store bags and coats
- Untidy sites create trip hazards and other problems – keep organized and things will run smoothly.



Figure 3: Materials are stored in a central place for easy access, not scattered across the site where they could form a hazard.

Planting

After all your preparation, risk assessments, access issues and managing your workforce, actually planting the trees is usually very straightforward!

- Use rope and/or tape measure to make straight lines for orchard trees
- Mark at appropriate spacing based on the rootstock used
- Remove approximately 1m of turf at planting location for grassed sites
- Dig hole approx. 50mm wider and deeper than the rootballs of the trees – put soil onto plastic sheet to not lose soil into long grass
- Place turfs upside in the hole
- Fork into hole sides and base to open air and drainage pockets to assist root growth
- Place tree in hole directly from pot – do not leave bare roots exposed to air as they can dry very quickly.
- Check tree lines are straight once all are in place
- Ensure ground surface level with the existing earth line of the tree
- Back fill hole and gently tread down
- Fit tree guards
- Record location of each variety (any name tags will fade over time)
- Hammer in stake on leeward side of tree so that wind blows tree away from stake not into it
- Fix tree to stake with rubber tie – allow some movement of the tree as stake is only to prevent trees being blown over and ensures they grow straight, not to hold tree rigid
- Add woodchip mulch around tree base if available
- Lose any excess spoil or turves onto suitable location
- Tidy and collect tools

Stakes and guards

There are a huge variety of tree guards available and each has a specific use. Choice of guard will be down to situation and cost.

Spiral guards are used at the base of the tree and can expand as the tree grows. They protect the tree from rabbits and small mammals. However, determined and sharp teeth can get through them but they can be doubled up. If damaged then can be carefully unwound and used again upside down. As with any plastic they will degrade and become brittle in sunlight (Figure 4). They are also easily broken by strimmers.



Figure 4: Spiral guards become brittle after a year or so and are easily broken, exposing the tree to damage.

Solid and mesh tubes provide a thicker guard against animals and strimmers. They do limit the growth of side branches, though they can be cut down to

allow lower branching if desired. Some are provided as tubes and cannot be unwound and so must be placed over the tree during planting. This requires care to not damage side branches and buds. Others are provided flat and cable ties are used to form the tube. These can be more easily wrapped around the tree. Generally they can only be used once, as they will need to be cut away from a growing tree.

Wire mesh cages provide strong protection against larger animals and trimmers. They are often wide and do allow side branches to grow out – though when they grow through the wire mesh they can rub and become damaged (Figure 5). The cages don't stop small mammals, but spiral tubes work well when used with the larger cage guards.



Figure 5: This tree has rubbed against the top of the wire guard, leaving a wound and weak spot.

Estate guards are large steel guards commonly used for street trees. They are expensive, heavy and must be very securely held in place. They provide excellent protection for the trees and lots of space to grow. Spiral guards should still be used to protect the base of the tree. They are also used on mature trees to prevent them being climbed.

Stakes are needed to provide support to the tree to ensure that it grows upright and sometimes the guard will need to be attached to the stake (Figure 6). Stakes should be no larger than necessary. They need to be hammered into the ground deep enough to ensure that they are fixed and rigid and not too close to the tree to allow space for growth. Ideally the stakes should be no taller than the lower branches of the tree as it grows.



Figure 6: Spiral guard, stake and tie – the tree and stake are well spaced allowing plenty of room for the tree to develop.

The role of the stake is to prevent the tree leaning over as it grows and this is subtly different from thinking of the stake as holding the tree up. If the tree

is fixed too tightly to the stake, the tree cannot move in the wind. It is this movement that stimulates the tree to put on growth around the base that provides the necessary support as the tree grows. Where trees are held too firmly, the trees' growth is supported by the stake and once the stake is removed, the trunk can be prone to breaking near the ground as it was never required to put on the necessary growth to support itself.

Ties are used to bind the tree and stake together and a huge variety is available. Ties should always form a "figure 8" with one loop around the tree and one loop around the stake (Figure 7). Some ties have slots to draw the end through to form the '8' while others use a spacer. This system helps ensure that the tree does not rub up against the stake and will allow the tie to be easily adjust at either tree or stake as needed. Buckles or knot should always be on the stake rather than the tree as this allow more easier adjustment.



Figure 7: A well fitted tree tie in a "figure 8", formed by the tie being fed through a band – not tight into the tree, but holding it upright.

The tie should fit snugly but not tightly around the tree. Too tight and the tree will not be able to increase stem diameter under the tie. Too loose and the tie can rub the tree as it moves in wind. The tie should be fitted tightly to the stake to ensure that it cannot slip down. A fencing staple or flat-head nail can be used to fix the tie to the stake.

Challenging sites

Land available for orchards may well be areas that are not well suited to other uses such as arable, grazing or even woodland planting. An example of such a site is shown in Figure 8.



Figure 8: A challenging planting site with dense bracken, steep slope and overhead power lines.

Bracken:

Bracken can invade and dominate a range of habitats but often occurs on sites previously used as pasture. The deep roots and rhizomes of bracken spread through soils and the accumulated litter from previous years' growth can form a dense mulch which prevents grasses and other species from growing resulting in dense monocultures of bracken. Summer growth of well over 1m high of dense bracken can shade newly planted trees as well as starve them of water and make access for aftercare difficult.

When planting on a bracken site there are a number of things to consider. Firstly, how will the dominance of bracken be reduced? Bracken is generally controlled by chemical spraying or rolling. Rolling can be very effective on large areas where metal rollers are towed behind a tractor, flattening and bruising the bracken stems, which reduces vigor. Rolling may be impractical on small or steeply sloping sites. A number of very effective agricultural herbicides can be used to treat bracken. This should always be carefully

considered before proceeding and only appropriately qualified persons should apply spray using approved herbicides. Choice of herbicide may be more limited on sites near watercourse and water bodies.

Next, consider how to remove accumulated dead bracken from previous years' growth. Larger sites may need to collect this with a chain harrow or similar, whereas with smaller sites the litter can be raked and piled up either for composting out of the way or removal from site. This can be hard work, but a motivated workforce can clear quite significant areas. Remember that only the areas to be planted require the removal of bracken litter and so either individual patches or rows only need be cleared, rather than entire sites.

Finally, a method to suppress future bracken regrowth, as least until the trees are high enough, should be considered. Bracken can recover from spraying and rolling and any further control after planting could be very difficult – with rolling practically impossible. There is a range of textile mats available that can be used to suppress regrowth (Figure 9). These can be pinned to the ground surface around planted trees and will restrict the growth of bracken and other competing plants. This can be effective for a few years, but these solutions will tend to tear and degrade overtime and will ultimately need to be collected up, removed and disposed of.



Figure 9: A geotextile matting has been pinned to the ground to prevent bracken regrowth competing with the newly planted trees.

Steep sites:

Areas of steep ground have a number of difficulties associated with them. First of course is the difficulty in planting and establishing trees. Access may be difficult meaning that all the trees, stakes and guards need to be carried onto site and a willing workforce or determined effort may be needed. Once planted, harvesting fruit can be difficult and larger trees requiring ladders for fruit picking or pruning should be avoided. Steep sites can be free draining and sunny which can both help the establishment of trees and a good harvest.

Monitoring and Aftercare

Once all of the tree have been planted, it's easy to think that all the work is done. However, all young trees need monitoring and some attention in their first few years after being planting. The quality of the early years care will have a huge impact on the life of the trees and having a good inspection and aftercare plan is essential and it should be given the proper attention and resources required.

Aftercare needs to be performed for at least the first three years, potentially longer.

- Check that the tree is still alive. This may sound obvious but some varieties will leaf later than others so check several times in spring before assuming the worst.
- Check for drought stress. Look for wilted leaves, browning, pale leaves and dead growing tips. Keeping an eye of the weather and ground conditions should also alert you to whether watering is needed. This may be impractical on larger sites of course.
- Check for any soil loss exposing roots and re-cover. This is more likely on steeper ground where any lose surface soil could be washed away.
- Check that the trees are still growing upright. Stakes can become lose as ground dries out, or branch growth can unbalance trees, leaning them over. Re-fixing and straightening stakes and trees is frequently needed.
- Check for any rubbing on the tree from ties, stakes or guards. Rubbing removes bark and can open wounds, which become weak spots resulting in infections and breaks. Good positioning of stakes, ties and guards will limit this, but as the trees grow, rubbing becomes more likely.
- Snip off any broken branches at branch collar or the bud immediately below the break.

- Adjust stake and tie to allow for growth – ensure tree can still sway in wind as this stimulates structural support growth.
- Check for any other vegetation that could shade or impede the growth of the trees. This could be bracken and bramble growing around the tree or for trees planted near boundaries, shading from surrounding tree lines and hedges.
- Undertake formative pruning once needed. Understanding how and when to prune young trees is important, as this will determine the shape and growth pattern of the tree. Attending an appropriate pruning course is strongly recommended
- Replace any failed trees early to ensure that your orchard trees develop together. Can you identify why the tree failed? Was it the wrong variety? Was it planted in the wrong place such as getting water logged or frost damage? Was it damaged by people? Is the ground stony or soil poor? Don't forget that even the best grown trees, treated with care and planted well, may simply not respond well to being disturbed and replanted. Typically 10% of plantings may fail, but anything over that may be cause for concern that the site is unsuitable.

Tools

First Aid kit

- Rope and tape measure for marking tree lines and spacing
- Pruning saws – for any surrounding trees
- Pole pruning saw/loppers
- Loppers or secateurs
- Broom (to clear surfaced paths)
- Spades for digging
- Plastic sheets (for soil from holes)
- Plastic trugs – can be useful for carrying tools or loading up with excavated soil,
- Axe – in the case where stakes need to be pointed
- Breaking bar – a heavy steel bar with a point, commonly used to break through any stones found in the planting pits.
- Lump hammer for fixing stakes
- Forks or hand forks

For volunteers:

- Warm wet weather gear
- Appropriate footwear
- Work/gardening gloves
- Refreshments – hot drinks and cakes/biscuits