



# Collecting tree seed to sell to a registered trader

## Introduction

There is increased interest in collecting tree seeds by community woodland groups in Wales, to provide a small income source by selling seed, to grow-on in small nurseries for eventual sale as seedlings or transplants, or simply to plant for woodland creation or re-stocking. Knowing when, where and how to collect seeds correctly from wild trees is important - if done well it can be an enjoyable, productive woodland activity, but done badly may result in the collection of low quality seed, poor growing stock and wasted efforts. Newly planted seed may not mature into adult trees for hundreds of years so it is well worth pausing at this first stage to do things properly, otherwise future generations may be disappointed by the results! The purpose of this short guide is to provide a brief checklist on how to sustainably collect high quality seed from native trees and to point readers towards relevant sources of more detailed information. It is aimed at those wishing to provide seed collected from their local area to a registered supplier on a contract basis. The legal obligations for those wishing to market collected seed directly, or to sell on as growing stock, are given in separate guidance: *Legal obligations when collecting tree seed in Wales*.



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## Why collect?

Registered suppliers of tree seed such as Forestart, Maelor Forest Nurseries Ltd and others are often interested in receiving seed from collectors around the country to boost their supplies or to fill shortfalls when demand is high for particular species. Payment is usually made on a contract basis for the collection, or as a royalty to the landowner from where the seed is sourced. However, it must be stated that the sums offered are not vast, and to make the work worthwhile collectors need to gather fairly large amounts and work efficiently. Typical payments for different species are listed below, but premiums are sometimes paid for seed coming from better quality stands (i.e. Forestry Commission (FC) inspected and approved “selected” stands), or for species which are in particularly short supply that year. You should always ensure that all collecting costs (including your time, transport and equipment) are taken into account. Although seed collection on this basis is unlikely to generate a large income, working outdoors in a woodland environment, especially if done as group of volunteers can be an enjoyable activity and there are often spin-off benefits to woodland groups.

### Typical prices offered for seed (2020).

Species	Price per kg of fruit *	Collection notes
<i>Acer campestre</i> <b>Field maple</b>	£4.00 - £8.75	Oct – Nov when dry and brown. Check that the seeds are full.
<i>Acer pseudoplatanus</i> <b>Sycamore</b>	£4.00 - £5.50	End Sept – Oct. When the seed has just turned yellowy / brown. Price may be less if very wet
<i>Alnus glutinosa</i> <b>Common alder</b>	£6.00 (cones) £0.50 (seed)	Sept – Dec (collect cones when brown – be careful to ensure seed is not lost from cones. Use sacks not net bags!)
<i>Betula pendula</i> <b>Silver birch</b>	£80.00	Sept – Dec (catkins intact –brown inside). Price depends on provenance and site
<i>Betula pubescens</i> <b>Downy birch</b>	£30.00 - £80.00	Aug – Nov (catkins intact –brown inside). Price depends on provenance and site
<i>Carpinus betulus</i> <b>Hornbeam</b>	£6.50	September – November
<i>Corylus avellana</i> <b>Hazel</b>	£8.00-£10.00	Late September. (Check that the seeds are full). Price depends on size & quality
<i>Crataegus monogyna</i> <b>Hawthorn</b>	£1.80 - £3.20	End Sept– early Dec. Collect when ripe (usually during October).
<i>Cornus sanguinea</i> <b>Common dogwood</b>	£5.50	End Sept– early Dec. Collect when ripe (usually during October).
<i>Euonymys europaea</i> <b>Spindle</b>	£5.00	
<i>Fagus sylvatica</i> <b>Beech</b>	£15.00	
<i>Ilex aquifolia</i> <b>Holly</b>	£3.00	Collected as cuttings with berries
<i>Malus sylvestris</i> <b>Crab apple</b>	£0.60 - £1.00	Sept – Oct. Once apples have fallen and appear ripe.
<i>Prunus spinosa</i> <b>Blackthorn</b>	£3.00 - £3.50	Late Sept – Oct, possibly Nov.
<i>Prunus avium</i> <b>Wild Cherry</b>	£8.00	July –Early Aug. Collect when fruit is ripe. Often collect from ground using nets.
<i>Quercus petraea</i> <b>Sessile Oak</b>	£5.00	Oct – Nov
<i>Quercus robur</i> <b>Pedunculate Oak</b>	£4.00	Oct – Nov
<i>Rosa canina</i> <b>Dog rose</b>	£2.60 - £3.00	Sept – Nov
<i>Sorbus aucuparia</i> <b>Rowan</b>	£1.30 - £2.00	Mid August - early Sept (when the seed is brown within the fruit)
<i>Viburnum opulus</i> <b>Guelder Rose</b>	£1.00	Collect when berries are red

\*The price offered will depend on the form of the material supplied, so always check what the purchaser requires in advance.

## When to collect

You should always plan your collection well in advance. The registered supplier will need at least two weeks’ notice of any collection so that they can complete the notification to FC which they are legally obliged to do, so you must contact them as early as possible. Seed needs to be collected at the correct state of maturity and this varies between species. As a guide, the expected seeding periods for native tree and shrub species are shown in the seed collection calendar document, but your plans need to be flexible - There is a great deal of variation between sites at different altitudes or aspect, and seed maturation will depend on the weather conditions that year, and also varies between individual trees. Seed needs to be collected at the correct state of maturity, often the first seeds that fall are small and not viable – but if you leave it too late then the wildlife or wind may beat you to it! Seeds should be assessed to check that they are at the right stage, viable and of good quality. Guidance on how to

## Where to collect

Always obtain permission to collect. When providing seed to a registered supplier, they will ask for various information, including the location of the collection site (ideally a 6 figure grid reference), your intended collection dates and proof from the landowner that you have permission to collect seed there. Some sites may be protected for their conservation value (e.g. SSSI or NNR etc.), and if you are unsure you can check for any designations on the Welsh Government mapping portal (<http://lle.gov.wales>) – you may still be able to collect seed from these sites, but you must contact the relevant landowner to get written permission. Even ‘commons’ are often managed by a commons committee and have a landowner. In some cases the landowner may ask for additional conditions on any collecting and these must obviously be adhered to.

## What to collect - Species identification

Make sure you know your species. It is important to be able to correctly identify the species of tree you are collecting seed from – usually this is easy, but for some species it requires more care, especially when species grow together e.g. Oak (Sessile vs. Pedunculate Oak) or Birch (Silver vs. Downy Birch).<sup>3,7,8</sup> Where a group of collectors is working, make sure everyone can correctly identify the trees you need.

## Selection of seed stands

In Wales, the guidance is to plant native species of local origin where possible, and the registered supplier you are collecting seed for will usually specify the origin or provenance seed zone that seed must come from. If looking for native origin species then naturally-occurring trees in larger (>4ha) ancient semi-natural woodlands would be a good place to begin. Knowledge of a sites history and management is invaluable, but often this is not available. As far as possible, collectors should ensure that the parent trees have not been planted. In the absence of solid information, there are other clues that might indicate a natural population e.g. evidence of historic coppicing, natural tree spacing (not straight lines) and lack of introduced species. Newly planted trees, hedgerows and isolated trees should generally be avoided.<sup>12,13</sup>

## Tree health

It is very important that the seed you collect comes only from healthy trees. Before you begin collecting, the parent trees should be inspected carefully. Forest Research provides information on current disease issues and what to look out for.<sup>14</sup> Some tree diseases are notifiable, and if seen should be reported, and seed should certainly not be collected from affected trees.<sup>14</sup> Seed collection from sites where *Phytophthora ramorum* (linked to sudden Oak death) is present should also be avoided.<sup>14</sup> As always, when working in woodland you should also be aware of more general biosecurity issues, particularly to minimise the risk of spreading pathogens between different sites.<sup>16</sup>

## Tree selection

When collecting seed the aim is generally to collect from a wide genetic base from a defined, identifiable *group* ('stand') of trees rather than from single isolated trees. Ideally the group should be a large distance from any non-native stock of the same species so that the risk of cross-breeding is minimised. If possible, equal quantities of seed should be collected from at least 20 – 30 individuals, so it is better to collect small amounts from many individual trees rather than lots from just a few. Unless specifically requested by the registered supplier, it is important NOT to select for any particular characteristics and your collection should reflect the visible growth and morphological characters present. In natural stands seed should be collected from well-separated trees, as individuals close to each other may well be the progeny of a single parent. Ideally there should be a minimum of 50 metres separation between parent trees. Even within a single tree, flowers in different parts of the canopy might have been pollinated by different male trees, so it is recommended that seeds should be taken from branches at different heights and different parts of the canopy if possible.<sup>11,4</sup>

## When to collect

It is important that seeds are collected at the correct stage of maturity and generally this is at the peak of when they are naturally being dispersed. The seed collection calendar (below) gives an indication of when to expect different tree species to be producing seed, but it is important to get to know the trees you intend to collect from as there is considerable variation between different parts of the country; between years (warm, dry summers can hasten seed maturity by up to four weeks); between sites (especially north- and south-facing aspects); and even between individual trees. Most trees in the UK do not produce large amounts of seed every year – there will be 'mast' years when conditions are favourable and considerable quantities of good seed are produced, interspersed with poor years where few seeds are produced, many of which will be small and non-viable. Before you begin to collect large amounts of seed it is important to assess the seed quality – e.g. by taking a sample of seeds and cutting some in half to examine them. Seed is often attacked by insects and sometimes viable seed can be identified by a 'float test'. Damaged or unviable seed tend to float and these should be discarded. For some species, early parts of the seed crop can be tested in this way as any small, immature seed will often float. If the seed is not fully developed it may be worth delaying your collection to let the seed crop mature. If you are collecting seed to sell to a supplier they will provide further guidance on how to assess seed quality.<sup>13,5</sup>

## How much to collect

Before beginning any collection, you should contact the registered supplier to agree the quantities of seed they are interested in. They will often specify minimum amounts that they will accept, or maximum amounts they need. Make sure you plan ahead to ensure you have enough suitable bags and equipment before you start. When collecting seed you should aim to gather an equal amount from each tree you have selected, so you should take your target amount into account when gathering seed. Although it is unlikely you will be able to collect *all* the seed from any stand, or even from a single tree, you should always leave some seed for wildlife that may rely on it as a food source, and also to allow natural regeneration of the woodland. A rough guide is never to take more than 20% of the available seeds, and never collect more seed than you need!<sup>20</sup>

## Collection techniques

Gathering tree seed can be problematic, as most trees bear the fruit and seed high up, well out of reach. Only a few species such as Beech and Oak have seeds large enough to be worth collecting from the ground.

There are lots of ways to collect seed and the most suitable method depends on the species, equipment available, and the quantities of seed you are hoping to gather:

For small quantities, fruit, nuts or cones can simply be plucked from the tree or collected from the ground provided they have just fallen. For larger amounts other techniques will be needed: The most efficient method is to fell the trees, which may sound extreme and should not be done just to collect seed, but if felling or coppicing is necessary anyway then this could be timed to coincide with seed production. For standing trees, seed should ideally be collected from across the tree canopy and in some instances professional tree climbers are employed for this task, but this is extremely risky and not to be undertaken by the inexperienced. A better alternative is to use long extendable pole pruners for fruits that are beyond arms reach. Another method is to shake the trees branches and gather falling seed onto large sheets laid on the ground below. Large scale operations have mechanical tree-shakers, but a more practical alternative is to use a line thrown into the tree from below. Care should always be taken not to cause damage when using any of these techniques. Large seed such as acorns or Beech mast can be collected from the ground, but this should be done immediately to reduce the risk of damage by pests and pathogens. Older seed lying on the ground should always be avoided. For Beech and Oak, a common technique is to lay nets or sheets beneath the trees so that they can be gathered easily and the age of the seed is known. Other species such as Birch and Alder have extremely small, lightweight seeds that are wind dispersed. For these, the slightly ripe cones must be collected from the tree before the seed is released.<sup>4,6</sup>

## Storage

Although seed can be initially gathered into buckets or plastic bags they should be transferred into hessian or paper sacks, or for very damp seeds, into net bags to allow some drying. Because tree seed is very sensitive to storage conditions (the viability of Oak falls considerably if they dry out even a little), it is important that this is done correctly, so you need to plan ahead. Keeping seed in plastic bags is not recommended as it can easily overheat or go mouldy. Very light seed should be kept in paper sacks with plenty of space for air to circulate.<sup>4</sup>

Longer-term storage of seed will depend on the type of seed and when it will be planted. First of all, seed may need to be separated from the fruit, cones, husks or shells. The most efficient way of doing this will depend on the quantities involved - small amounts of soft fruit can be mashed by hand, for larger amounts a concrete mixer might be useful.<sup>5</sup> Most, but not all, of our native trees require a period of cold before they will grow, this is called 'seed dormancy'. Some species such as Oak and Aspen are non-dormant and should be planted immediately whilst others may need one or even two winters cold before they will grow. 'Stratifying' seed is a way of mimicking the natural conditions required for germination, and each species has its own unique requirements. FC Practice guide "Raising trees and shrubs from seed"<sup>18</sup> gives suggested stratification methods for different species. The commonest method is to refrigerate the seed (at approx. 1° to 3°C for 2-24 weeks) in suitable containers, then warming (approx. 20°C) for 2-10 weeks, depending on the species.<sup>3,9,19</sup>

## Labelling

It is good practice to label all bags of seed as it is collected, with the species name, date, and collection location reference. Always use waterproof labels and make sure they are well attached to any bags or containers.

## Delivery to the registered supplier

Seed should be sent to the purchaser as soon as possible after the collection is complete. Keep your collected seed in a cool place until then. They will usually prefer the seed to be delivered in person as this is a good way to discuss the collection and offer advice. In extreme circumstances they may accept seed to be delivered by courier, but this is not ideal as seed can go off if the delivery is delayed, so always agree this advance.

### Key points

- ◇ Contact the registered supplier who you wish to supply seed to as early as possible to discuss your contract to supply
- ◇ Always get the landowners permission in writing before you start
- ◇ Organise & plan your collection days well in advance
- ◇ Make sure you can correctly identify the parent tree species
- ◇ Never collect from diseased or unhealthy trees
- ◇ Try to collect from 20-30 well-spaced trees in a defined stand
- ◇ Before collecting large quantities, check that the seed is viable and good quality
- ◇ Collect seed/fruit at the appropriate state of maturity
- ◇ Do not collect seed from the ground
- ◇ Clean, dry, and store the seed correctly
- ◇ Keep good records and make sure all collections are well-labelled
- ◇ Deliver your seed to the registered supplier immediately after the collection is complete

## Useful resources / Reading list

1. FC Forest Reproductive Material: Regulations controlling seed cuttings and planting stock for forestry in Great Britain (2019) online at: <https://www.forestresearch.gov.uk/research/forest-reproductive-material-regulations-controlling-seed-cuttings-and-planting-stock-for-forestry-in-great-britain-2nd-edition/>
2. FC The Basic Obligations for Suppliers under the Forest Reproductive Material Regulations. Online at: <https://www.gov.uk/guidance/work-with-planting-material-for-forestry-purposes#basic-material-and-forest-reproductive-material>
3. The Good Seed Guide. Tree council (undated) ISBN 0-904853-01-2
4. UK National Tree seed project Kew Botanic Gardens July 2014
5. BTCV (NI) Autumn Seed Harvest. Available online at: <https://treegrowing.tcv.org.uk/wp-content/uploads/2019/09/handbook.pdf>
6. TCV Handbook: Tree planting and aftercare (available online but subscription required) at: <https://www.conservationhandbooks.com/tree-planting-aftercare/>
7. Trees in Britain (1978) Roger Philips. ISBN 0-330-25480-4
8. rees and how to grow them (2008) Tree Council ISBN 978-1084525-060-7
9. Seed manual for ornamental trees and shrubs (1982) FC Bulletin #59. Available online at: <https://www.forestresearch.gov.uk/research/archive-seed-manual-for-ornamental-trees-and-shrubs/>
10. Ecological Site Classification (2020) Forest Research. Available at: <https://www.forestresearch.gov.uk/tools-and-resources/ecological-site-classification-decision-support-system-esc-dss/>
11. FC Practice Note August 1999 Using Local stock for planting native trees and shrubs. Available online at: <https://www.forestresearch.gov.uk/research/using-local-stock-for-planting-native-trees-and-shrubs/>
12. Flora Locale “Code of practice for collectors, growers and suppliers of native flora”. Planting with wildlife in mind 2012. Available online at: <https://cieem.net/resource/code-of-practice-for-collectors-growers-and-suppliers-of-native-flora/>
13. Maelor Forest Nurseries Ltd Procedures and guidelines for collecting local provenance native trees and shrub seed. (unpublished (Contact Maelor via their website <http://www.maelor.co.uk/>))
14. NRW Tree health in Wales <https://naturalresources.wales/guidance-and-advice/business-sectors/forestry/tree-health-and-biosecurity/tree-health-in-wales/?lang=en>
15. FC Current advice on Ash dieback: [file:///C:/Users/Desktop/Downloads/Guidance\\_note\\_ash\\_dieback\\_national\\_measures\\_March\\_2020\\_.pdf](file:///C:/Users/Desktop/Downloads/Guidance_note_ash_dieback_national_measures_March_2020_.pdf)
16. NRW How to practice biosecurity in woodlands: <https://naturalresources.wales/guidance-and-advice/business-sectors/forestry/tree-health-and-biosecurity/how-to-practise-biosecurity-in-woodlands-keep-it-clean/?lang=en>
17. FC Bulletin #111: Forest nursery practice. Available online at: <https://www.forestresearch.gov.uk/research/archive-forest-nursery-practice-2ed/>
18. FC Practice guide #18: Raising trees and shrubs from seed (2007). Available online at: <https://www.forestresearch.gov.uk/research/raising-trees-and-shrubs-from-seed/>
19. FC Bulletin #83 Seed manual for forest trees (1992). Available online: <https://www.forestresearch.gov.uk/research/archive-seed-manual-for-forest-trees/>
20. Royal Botanic Gardens, Kew: A field manual for seed collectors [http://brahmsonline.kew.org/Content/Projects/msbp/resources/Training/English\\_kppcont\\_035653\\_A-field-manual-for-seed-collectors.pdf](http://brahmsonline.kew.org/Content/Projects/msbp/resources/Training/English_kppcont_035653_A-field-manual-for-seed-collectors.pdf)

## Note 1: Native Species / Local Provenance / Local Origin of trees

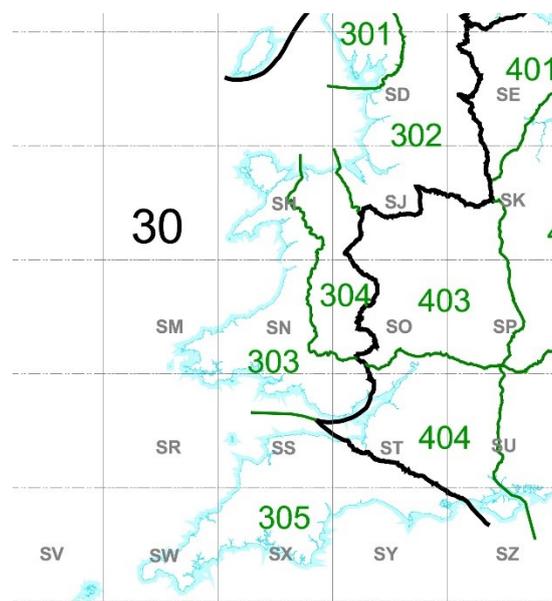
There is much debate over the most suitable trees that should be planted to provide resilience for climate change. Currently the conclusion is that we cannot predict Wales's future weather other than that we should expect more frequent and more extreme weather events. The advice remains that local site characteristics (soil type, exposure, droughtiness, etc) should always be taken into account. For woodland planting where ecological benefits are the main focus (rather than timber production), native tree species should be used wherever possible, and these should also preferably be of Local Origin, or at least, of Local Provenance.

**Native species:** are generally considered as those which colonised Wales after the last Ice Age, before humans moved seed and plants around. There are some 'naturalised' species such as Sycamore which are difficult to be so categorical about. The Forest Reproductive Materials (FRM) Regulations<sup>1</sup> give a list of 64 tree and shrub species considered as 'Native to Great Britain'. The importation of non-native planting stock can (and has) resulted in hybridisation with native British species and the potential loss of genetic diversity.

**Local Origin / Local Provenance species:** The term 'provenance' is used to describe the location of the stand from which seed was *collected*. 'Origin' is the geographic locality within the natural range where the parent tree or its wild ancestors *originally grew*. Thus it would be possible to grow a tree of a 'local provenance' that is actually of overseas origin, if the seed was collected from an imported parent tree (e.g. those planted in estate grounds or plantations).

The Forestry Commission (FC) has divided the UK into four Regions of Provenance which are then subdivided into 'local seed zone provenances', mainly based on natural ecological boundaries. The FC provide a map showing these seed collection areas and the appropriate Local Provenance (LP) area code must be provided for any seed requiring an official master certificate. Wales is mainly covered by LP zones 303 and 304, but small parts of NE, E and SE Wales come into zones 302, 403 and 404.

### Regions of provenance and seed zones for Wales



When collecting seed, the origin of the trees is often not known, but it is assumed that the parent trees growing well in an area have adapted to the local conditions. Therefore, when planting at a site, local seed should be used where possible. If seed from further away is used then the trees may not grow as well, or they may behave differently from locally adapted stock, e.g. they may open their buds earlier, their leaves may be more prone to early frosts, or flowers and fruits may develop at the wrong time for local insects to benefit from them.

If seed is collected with the intention of planting new-, or restocking existing- seminatural woodland then the UK forestry standard and the associated Forestry Practice Guides 1-8 'The management of semi-natural woodland' recommend using plants of local provenance.<sup>2</sup> The UK Woodland Assurance Scheme also seeks the use of seed of native species.<sup>3</sup>

Although Native trees of local origin and/or provenance are still recommended, more information is still needed about the range of genetic diversity present in British species and whether this is sufficient to ensure they will cope with all future climate possibilities. Consequently, the current advice is to:

- ◇ Plant a mixture of species, as some species will be more tolerant to varying conditions than others
- ◇ Plant local provenance, though planting a mixture of *nearby* provenances might be acceptable. However, local site characteristics (altitude, aspect, soils) and local climate should still be well matched.

Further useful advice regarding selection of trees for planting is available on the Forest Research website.<sup>4</sup>

All those intending to plant trees should be fully aware of the characteristics of their site and their requirements, and use the most suitably sourced seed. Forest Research provides guidance on species selection and how to characterise your planting site and also offers some advice on planting for climate change resilience.<sup>5</sup>

### Useful resources:

1. FC Forest Reproductive Material: Regulations controlling seed cuttings and planting stock for forestry in Great Britain (2019) online at: <https://www.forestryresearch.gov.uk/research/forest-reproductive-material-regulations-controlling-seed-cuttings-and-planting-stock-for-forestry-in-great-britain-2nd-edition/>
2. Forest Research Practices guides: Management of Semi-natural woodlands. Online at: <https://www.forestryresearch.gov.uk/research/?search=The+management+of+semi-natural&page-type=publications&page-type=research-topics>
3. UK Woodland Assurance Standards. Online at: <http://ukwas.org.uk/standard/2-management-planning/#section-8>
4. Forest Research: Tree Species and Provenance. Online at: <https://www.forestryresearch.gov.uk/tools-and-resources/tree-species-and-provenance/>
5. Ecological Site Classification (2020) Forest Research. Available at: <https://www.forestryresearch.gov.uk/tools-and-resources/ecological-site-classification-decision-support-system-esc-dss/>



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