OUR TREES

A GUIDE TO GROWING IRELAND'S NATIVE TREES IN CELEBRATION OF A NEW MILLENNIUM

the people's millennium forests

IRELAND

AIB

Our Trees

A guide to growing Ireland's native trees in celebration of a new Millennium

managed by coillte in partnership with woodlands OF IRELAND

Ancillary programme sponsored by Forest Service

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Tree Council of Ireland

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John McLoughlin, Dr. Declan Little, Dr. Aileen Sullivan, Mick Doyle, and Pat Doody and Monica Murphy of the Coillte Nursery, Ballintemple. Special thanks to the late Dinah Browne who took time out to comment on our revisions, and to Mike Hartwell for all his help and wonderful photographs.

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Acorns being transported to the Coillte nursery at Ballintemple, Co. Carlow. 900,000 acorns were collected on behalf of the People's Millennium Forests in the autumn of 1999.

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Foreword

The People's Millennium Forests is the largest ever project in Ireland directed at the expansion and enhancement of our native woodlands.

Once an intimate part of our culture, Ireland's native woodlands are now in danger of becoming a lost legacy and this project is the first significant attempt to redress centuries of overexploitation and neglect. Up to six thousand years ago native forests of oak, ash, elm, birch, pine, alder and hazel trees flourished across Ireland's landscape. By 1900, less than one percent of these woodlands remained, and although progress has been made in restoring forest cover, Ireland stands today as one of the least wooded countries in Europe.

The native woodlands that remain are important havens for our native flora and fauna as well as being a potential timber resource for the future. They require careful management to protect them from overgrazing and the spread of non-native plants. It is widely recognised that there is an urgent need for focused action that will work to protect, restore and expand our valuable native woodland resource.

Concerted action needs to involve a range of both public and private bodies and individuals, to ensure that our native woodlands are maintained in a viable and sustainable condition into the new millennium.

With the support of the AIB, the National Millennium Committee and the Forest Service of the Department of the Marine and Natural Resources, 16 forests have been restored to their former glory in a project managed by Coillte in partnership with Woodlands of Ireland. Over fifteen hundred acres of native Irish woodland have been designated as 'People's Millennium Forests' and will be dedicated in perpetuity to the people of Ireland. The forests include newly planted areas using native Irish seed and the restoration of native woodlands that have been in existence for at least 200 years and probably longer. A native tree has been planted on behalf of every household in Ireland and the forests will form a lasting legacy for all to enjoy. You can find out more about this project on our web site: www.millenniumforests.com.

This book is designed specifically as part of this project, as an aid to those who wish to learn more about growing native trees from seed. In the preparation of this guide, I would like to acknowledge especially the support of the late Dinah Browne who compiled the original book for CVNI and Dr. Marian Coll, Outreach Officer, the People's Millennium Forests, for her work on this edition.

John McLoughlin
Project Manager
The People's Millennium Forests

Introduction

There are many reasons why we want to plant and grow trees. For their conservation and timber value, their beauty, for their value in the landscape, for shade and shelter, in general for the pleasure they give us.

Trees are our largest green plants, and play a vital role in the natural world. They support a multitude of other life forms such as mammals, birds, insects and plants. They also provide a clean air service for us, filtering pollutants and absorbing carbon dioxide from the atmosphere around us, all of which come from sources such as the burning of wood, coal, oil, gas, petrol, etc. In addition, power stations and manufacturing processes pour carbon dioxide into the air.

All plants use energy from sunlight to combine this atmospheric carbon dioxide with water, absorbed through their roots, in the process of photosynthesis. This chemical reaction produces the carbohydrates and proteins by which plants grow. As a by-product, it releases oxygen - literally the breath of life that we use in respiration.

Trees may bring a touch of the country into cities. They may soften the harsh outlines of commercial buildings, reduce traffic noise, filter out dust in the atmosphere, enhance our parks and gardens.

Tree conservation is not only about individual trees but even more about conserving woodlands. Trees are an integral part of the natural world and even a solitary tree may support a wide range of wildlife. However, the greatest conservation value is in long established woodlands of native species. A whole range of plants and animals have evolved to live in woodland and literally cannot survive without their tree cover.

Ever since our ancestors started to clear land for homes and farmsteads, trees have been felled. They have provided fuel, fencing, charcoal, building material for houses and ships. Rising human populations, more intensive agriculture, growth of towns and roads, have all caused increasing loss of trees. By the turn of the last century, less than one percent of Ireland's native woodlands remained.

It is up to all of us to replace and increase tree numbers. It is not difficult, can be great fun and is very rewarding. The trees provide their own seed, which anyone can collect and grow. You just need to follow some simple guidelines, as you would with any other seed.

Native Irish oak seedlings, grown in Coillte's nursery in Aughrim, Co. Wicklow, ready to be planted in the People's Millennium Forests.

Trees of Ecological Importance

Mistlethrush

Acorns being planted by schoolchildren at Coillte's nursery in Aughrim, Co Wicklow.

Much emphasis is put by conservationists on the use of "native species" as opposed to the use of species from other countries in the management of the countryside for wildlife. Why bother with the distinction? Does it really matter what we plant? To understand the question and to be able to formulate an answer we need to look back in history for a moment....to understand what is meant by a native species and why from a conservation point of view this is something important to understand.

NATIVES

Today, none of our native woodlands have remained untouched by human influence and all are now considered to be semi-natural. They are composed primarily or wholly of local native species of trees and shrubs that are derived from natural regeneration, coppicing or from mature plantations. Often managed and nearly always influenced by human activities such as grazing, most of these woodlands are relatively recent in origin, established by natural colonisation in the last few decades, whilst some are much older, ancient semi-natural woodlands.

Native tree species are generally seen to be those species that managed to arrive in a location naturally, without any human intervention whilst those that have been introduced are seen as distinct from the natural vegetation. In Ireland, our native vegetation is comparatively young, for 15,000 years ago most of the land surface had just been released from the grip of the last ice age and was beginning to recover as the temperatures warmed up. If we could have stood anywhere in Ireland for the next 2,000 years we would have seen an ever changing scene, with advancing waves of plants and animals migrating back into Ireland from the warmer parts of Europe over the land that later became drowned under the English channel and Irish Sea. The south-west of Ireland was also linked to Brittany by a landbridge, which was subsequently submerged. The first woody plants to appear, hardly big enough to be called trees, colonised the grasslands and lake edges that had developed over the poorly developed soils and gravels left behind by the ice.

Today, these first plants, dwarf willows and junipers, now hang on only in places where the environment makes it difficult for other taller trees to grow, such as the Burren, or on mountain cliffs. Over much of the country they were rapidly crowded out by taller birches, willows, aspens and bird cherry when woodland as we know it started to establish itself. This in its turn was swamped on the drier ground by a great wave of hazel, which by 9,000 years ago covered Ireland from end to end. These rapidly spreading trees relied on the production of vast quantities of seed dispersed by wind, as is the case of willows and birch, or animals as in the case of hazel. They could also produce the seed when they were relatively young, unlike the big forest trees such as oak. However, the longer lived high forest trees eventually arrived, so that by 8,000 years ago pine dominated on the western sea board, oaks on the drier, free draining acid soils (sessile oak) and heavier lowland clays (pedunculate oak), whilst ash and wych elm flourished where the soil was more alkaline over the major central parts of Ireland. In wetter and boggy areas, alder and birch were dominant. Apart from the wetlands, woodland covered most of Ireland.

7,000 years ago, the landbridges were flooded and Ireland became an island, halting the arrival of further tree species. Some species that grow well here are regarded as native to Britain and continental Europe but can not be considered to be native to Ireland.

Beech is one; limes, field maples and hornbeams are others.

During the re-colonisation of the land by woodland, all the other components of what makes a woodland a very complex community of plants and animals spread with them. Each species of tree carried with it a baggage of snails, insects, lichens, birds and fungi as well as herbs and plants that grew in its shade and in the soil it created. Insects, in particular, form very complex webs of life, with things that eat leaves, buds, flowers, roots, then things that eat those, or parasitise them. All these make good food in their turn for birds, mice and other mammals. It is not surprising then to realise that trees such as oak and willows have developed a large number of insects that feed only on them, over 450 species. Birches support over 300, and alder, elm and hazel over 100 each. They are therefore supporting a wide range of wildlife in their own right.

SPECIES FROM OTHER PLACES

Over the last few hundred years, many different species of trees and shrubs have been introduced into Ireland, familiar species such as beech, horse chestnut and sycamore. Although these trees have become a familiar and much loved part of our landscape, they are not natives and as such do not support as wide a variety of native insects. For example, beech supports 98 species, whilst sycamore supports only 43. They are both beautiful trees but the chances are that only a small amount of the associated baggage arrived with them. So generally speaking species from other places definitely do not support such a diversity of other wildlife as do native species. In addition, both beech and sycamore cast very dense shade and are in leaf for a much longer season than the native species, which kills off most of the Irish woodland flowers with the exception of bluebells. They can also out compete native trees, thereby excluding them from the forest community altogether.

For this reason the People's Millennium Forests project concentrates solely on the natural regeneration and planting of native tree and shrub species. Forests comprising only native species will support a wider variety of our native flora and fauna than those made up of introduced trees.

Our Woodland Heritage

Courtesy of Dúchas The Heritage Service.

Ogham stone

Fairy thorn

Our native tree species have been linked with Irish culture and society from the earliest times. Trees were of the greatest importance, not only for the obvious practical reasons but also for spiritual reasons. Imagine what the ancient woods of Ireland must have been like for our ancestors. Every tree had its uses; ash for hurleys, alder for shields, hazel for construction. The most important tree of all was the mighty oak, which was considered chief among the *airig fedo* or nobles of the forest. Woodland was a resource used by everyone, and the importance of woodlands is reflected in the laws created to protect them. In pre-Christian times, Brehons or judges were responsible for the law and some of these laws dealt specifically with trees. The penalty for damaging particular trees was a fine, usually exacted not in money but livestock. For example, if you cut down an oak or a hazel tree, you could be fined two and a half cows while the fine for cutting down an elm or birch tree would be one cow! The different penalties reflected the relative importance of each tree.

When it came to translating spoken Irish into the written word the ancient Irish came up with a system that reflected the special role that trees played in every day life. It is thought that this alphabet, called Ogham was invented around the fourth century and that it was designed specifically for the Irish language. Where it was invented and by whom is not known. We can still see some examples on carved standing stones in old monastic sites, in the National Museum of Ireland and in the Ulster Museum.

The letters of the Ogham alphabet were all assigned names, which may have started out as examples for teaching purposes. Unlike letters in the English alphabet, these letter names were meaningful words. Originally eight letters were named after trees – birch, alder, willow, oak, hazel, pine, ash and yew. In the middle ages, scholars read other tree names into the remaining letters, resulting in a tree alphabet.

An eighth century description of how Ogham is read again shows how the lore of trees had become mingled with writing: 'Ogham is climbed (read) as a tree is climbed, treading on the root of the tree first with one's right hand before one and one's left hand last'. This indicates that Ogham should be read as it is inscribed on upright stones, from the bottom up.

There was more than just a

practical and economic value placed on trees and woodlands. The ancient Irish were a spiritual people who lived in harmony with nature. They saw magic and enchantment all around them and especially in trees. Many species of tree such as yew, hazel, hawthorn, elder and rowan were considered to have magical properties. Very often a single hawthorn can be seen, standing alone guarding a special place. These trees are regarded as fairy thorns, a meeting place for fairies or *sidhe*. Hawthorn trees are also associated with holy wells, where hanging strips of cloth or rags sometimes marks their presence. Such trees are known as rag trees. Rowan trees too are associated with the fairy host, while its berries were used as a protection against evil.

Individual trees that stood out in the landscape as being remarkable, perhaps for their size or shape, or the place in which they grew, were of particular importance and were known as *bile*. This word still exists in Irish place names such as Rathvilly in Co. Carlow and Moville in Co. Donegal. Many place names in Ireland incorporate other tree names. Of the approximately 62,000 townland names in Ireland, 13,000 mention trees while 1,600 mention some derivation of *dair* (oak), such as dare or derry

With the arrival of Christianity, many trees and groves that were sacred in pagan times were taken over and adapted for Christian worship. This can often be seen today in the presence of ancient yew trees within church grounds or the combination of the word *cill* or church with tree names i.e *Cill Dara* or Kildare. We also know that many of the early Irish saints had favourite trees; St. Kevin had a favourite yew tree at Glendalough while St. Bridget had a special oak in Kildare.

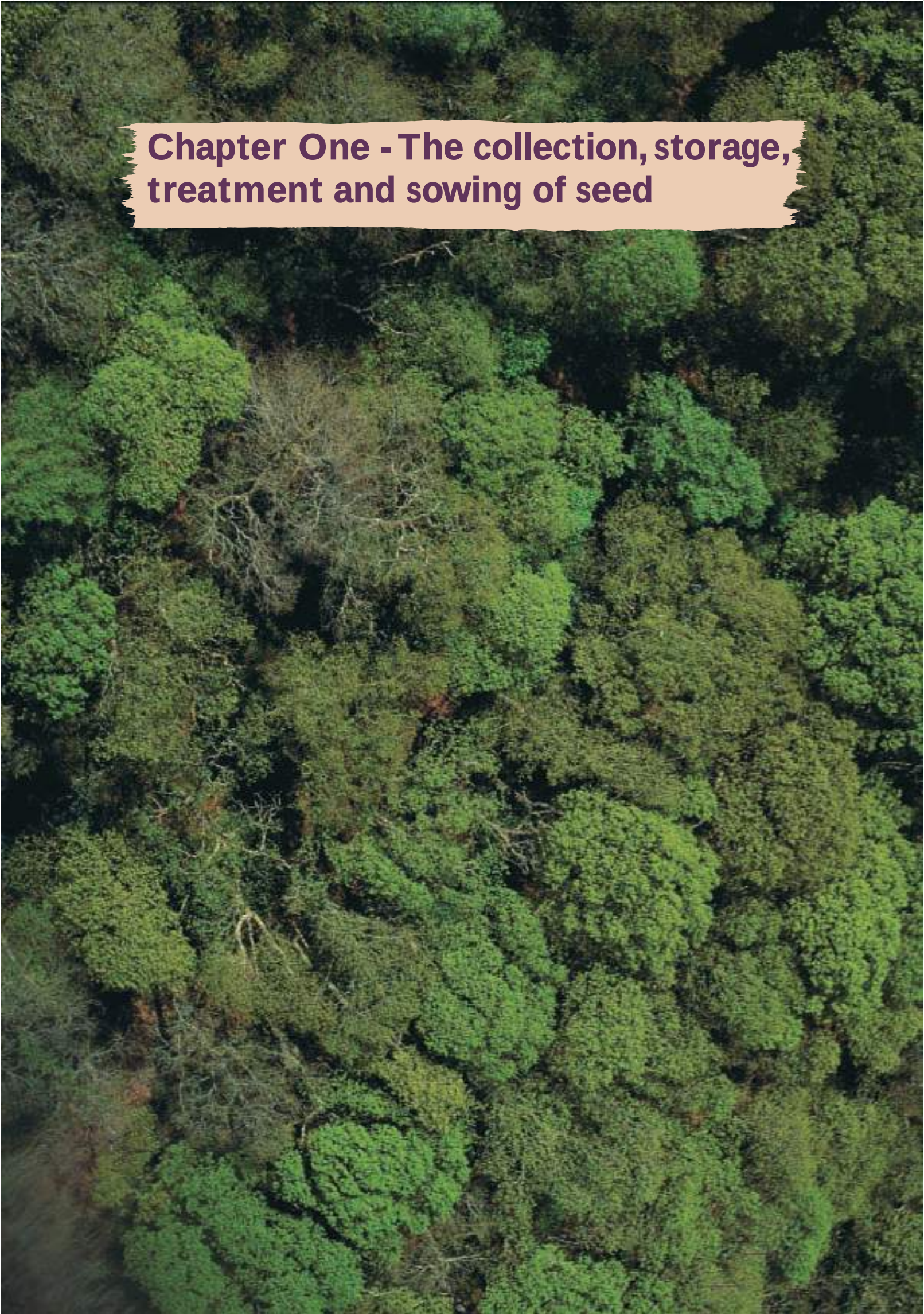
After centuries of exploitation, we have lost much of our natural woodlands along with the lore that was so much part of them. Some traditions still persist; lone fairy thorns can still be seen dotted around the landscape, especially around ringforts and raths, whilst occasionally one may come across a rag tree or bush.
Although much of our woodland traditions are gone forever, we can at least strive to restore our native woodlands to their former glory and find a place of relevance for them in the modern world.

The Tree Alphabet

B	(beith)	Birch
L	(luis)	Rowan
F	(fearn)	Alder
S	(saille)	Willow
N	(nin)	Ash
H	(huath)	Hawthorn
D	(dair)	Oak
T	(tinne)	Holly
C	(coll)	Hazel
Q	(quert)	Apple
M	(muin)	Bramble
G	(gort)	Ivy
Ng	(ngetal)	Reed
Ss	(straif)	Blackthorn
R	(ruis)	Elder
A	(ailm)	Scots Pine
O	(onn)	Gorse
U	(ura)	Heather
E	(eadha)	Aspen
I	(iodha)	Yew

Rag tree

Chapter One - The collection, storage, treatment and sowing of seed



The collection, storage, treatment and sowing of seed

Seed Collection

Seed may be collected as soon as it ripens on the tree or shrub, or you may wait for it to fall - much easier than trying to reach acorns high on a mature oak tree!

In general, seeds turn colour as they ripen and are easier to pick, so you can tell when they are ready. Guidance is given for each species in the individual notes. Some trees always bear more seed than others of the same species, and many vary in yield in different years.

You may choose seed from a healthy looking specimen which is well grown, but some mis-shapen trees are the result of poor soil or excess wind rather than any genetic weakness. Certainly avoid trees which look diseased, for example with canker (lumps on trunk or branches). Try to take seed from as many specimens as possible so as to achieve maximum genetic diversity.

Seed must be fertile if it is to germinate successfully, so it is best to collect seed where there is a group of trees, when cross-pollination and fertilisation are likely. A solitary tree may be too far away from others of its own kind.

For native species, choose trees which look as if they are part of the countryside. For example, do not choose rowan trees in a park or beside the road, which are probably imported, but rowan trees growing out in the country, perhaps on rocky ground which has never been cleared for agriculture.

If you know where the final trees will be planted, try to take seed from that area. Not only will the genetic match be good, but these are also likely to grow more successfully - after all, they have adapted to grow in those conditions.

If you intend to plant beside a nature reserve or special area of conservation (SAC), the best plan is to ask permission to collect seed within the scheduled area and then grow on trees from that local stock.

That way you can be sure of planting the right trees.

Storage

You will need a container when you first collect the seed. Hessian or open mesh bags are good, or open baskets for large seeds like acorns. If seeds cannot breathe they may become damp and overheated which reduces chances of successful germination, and the seeds may even go mouldy.
In general, avoid polythene or plastic bags which do not allow air to circulate, but these may be used for berries which can be kept in open polythene bags for up to a month before stratification. If the flesh begins to rot this will not harm the seeds.

Some seeds may be sown straight away, although there are problems with birds, mice and shrews eating them over winter. Most need to be stratified: stratification is a cool damp storage period which allows the seed to prepare for germination. It is a simulation of natural winter conditions.

It is sensible to get the seeds into the seedbed, or start stratifying, as soon as possible after collecting them. However, if seed has to be kept temporarily, leave it in suitable containers in a cool dark place - a weatherproof garden shed is fine.

Pine cones, alder cones and birch catkins may be stored entire, and the seed shaken out immediately prior to sowing. Do not remove the flesh from berries until you are ready to stratify or sow the seed, or plan long term storage, as these kernels are vulnerable to drying out.

You will need special equipment for these unreacheable seeds!

Avoid taking seeds from trees with diseases such as canker.

True native trees are rarely found in road-side planting.

Instead, take seed from trees that grow in the wild.

Stratification - make holes in your buckets and crocks for drainage.

Stratification drums should be left well-drained and outdoors in natural conditions.

Long Term Storage

If you wish to store seed for more than a few weeks, for example saving part of a good year's harvest to plant in future years, first extract the seeds/stones from their cone, seed pod or fruit/berry flesh as necessary. Once clean and dry, put them into polythene bags, squeeze out as much air as possible and seal firmly. Then store in a refrigerator at between 2° and 3° C.

Seed may be kept in this way for several years and will remain viable. When you are ready to use it, stratify in the correct way for that species and sow in the spring.

Stratification

Under natural conditions, very few seeds would germinate as soon as they fall from the parent tree. Most will spend the winter in a dormant state and this period is actually necessary to prepare the seed for germination and growth. Some berries may be eaten by birds and the seeds voided in droppings - this is very effective assistance to germination.

To grow trees or shrubs in controlled conditions, it is necessary to provide this preparatory period by stratification. Containers such as small plastic drums, buckets, or shallow calf feeder type buckets may be used. These need to have holes drilled in their base and a layer of broken crocks or large stones for drainage.

Seeds should be mixed with sand plus leaf mould, ground bark, or a peat substitute - a free draining mix - about one part seeds to three parts sand mixture. The best sand to use is sharp sand, from a builders supplier. This is free draining and the sharpness deters mice from digging out and eating your seeds. Never use sand from the seashore, which would be salty.

The containers are filled with the seed/sand mix and a layer of sand put on top. They should stand out of doors in natural conditions, preferably in a shaded area and it is necessary to make sure they never dry out. Below a north wall is ideal.

Stratification is needed by most seeds, each species having its own requirements. For berries, it stimulates natural decomposition of the flesh, the presence of which actually inhibits germination. Many seeds need a cold period before they can germinate.

As you approach sowing time, in February, you must check the stratified seeds for signs of germination. This is especially important if there has been a mild spell of weather (over 10° C). The seeds will look swollen and the tip of the radicle (first root) will begin to show.

Once germination begins in the containers it cannot be stopped. Seed development is rapid, so it is a matter of urgency to get the seeds out of stratification and into the seed bed in a day or two - you cannot leave them for longer, because the growing radicle is fragile and it must not be damaged when planting out.

If in doubt, sow early rather than waiting too long!

Maceration

This treatment of seeds before stratification removes the flesh and skin which maintain dormancy and inhibit germination. Experience has shown that the process increases the germination rate of hawthorn, holly and rowan.

Although it is a bit of extra work, it is recommended to maximise your return on collecting berries but it is not essential: most berry seeds will germinate after stratification with or without preliminary maceration.

Maceration separates the fleshy pulp from the seeds.

Hosing aids the separation.

Non-viable seeds float to the top.

First obtain a strong water-tight container. A strong flat bottomed bucket is usually adequate. Next you need a pulverising tool e.g. a large potato masher or a rounded three inch pole. Half fill the bucket with berries and add two pints of water. An up and down gentle pounding action with the pole or masher will reduce the berries to mush. The addition of the water will reduce the tendency for the mixture to stick to the masher. The resulting mass of pulp, skin and exposed seed may then be stratified in the usual way or the seeds may be separated out.

Using a rounded pole about $1^1/_2$ metres long saves having to bend over the container and the weight of the pole helps with the pulverising. It is easier if the berries are fully ripe or crushing them can be difficult.

On a small scale, extract seeds by hand.

Seed Extraction

After maceration, the entire mass of pulp, skin and berries may be sown, but extraction of the seed makes the whole process more exact. It also releases the seed from the inhibiting effects of the pigments contained within the pulp and skin.

Vigorous washing of the damp mass with hose pressure and stirring causes the pulp and skin to rise to the top, when it can be poured off. The viable seed, being heavier, will sink to the bottom and can easily be separated. Discard seeds that float, which are infertile (this float test is also a good check for viability of hazel nuts).

Extraction is particularly beneficial for rowan, but hawthorn and holly also benefit although these are still slow to germinate, needing two to three seasons.

Sowing

If seed is sown straight away after collection, it will stratify naturally in the ground. However, some species need a really cold winter to break dormancy, some take two or three years to develop, and in general germination is slower and more variable without proper preparation by stratifying.

Applying the float test to hazel nuts.

When seeds are stratified under controlled conditions few are lost and germination is more even and reliable. Maceration and extraction help some species even more.

There are other problems with sowing straight away - seed may seem to us to be hidden under the ground, but there are plenty of birds and small mammals that can smell it out and make a good meal.

So seed losses may be high, seed will be occupying ground when space is short, and you will have a crop of uneven age young trees. On a small scale this may not matter too much, but if you are producing trees in any quantity it adds to the labour, which is not desirable.

More advice is given after the individual accounts.

Chapter Two -Trees

Alder - Fearnóg

(Alnus glutinosa)

One of Ireland's most traditional and widely distributed trees, alders may be found in damp areas, beside freshwater loughs and along river banks, where their strong fibrous roots may help to keep the bank in place. Alder woodlands are found in Ross Island, Killarney, Co Kerry and the Gearagh, Co. Cork, while Grantstown wood, Co. Laois is a rare example of wet woodland on an alkaline soil.

Like most trees, alder flowers before the leaves are out, with attractive reddish catkins and small cones that contain the seeds. Alder will grow in most soils, and likes wet sites. Given rich damp soil alder will grow rapidly and is a really productive tree for timber. In ancient Ireland sections of alder trunks were used as round shields. Later, it was used for making clogs and also in the furniture trade where it was known as 'Irish mahogany'. As it is resistant to decay when submerged in water, alder is used to make sluice gates and other structures along streams, rivers and canals.

Collection

Collect alder seeds by gathering ripe cones in autumn. When dried the cones will open and can be shaken, in a bag or tin box, to help release the seeds. Separate seeds from the cones using a riddle or a large sieve.

Storage

Store the seed in a cool dry place in a natural fibre (hessian is best choice) bag. Never store fresh seed in a plastic bag because it excludes air and causes the seed to heat up thereby lessening its viability. They should be stratified for one month prior to sowing, in a mixture of sand and peat substitute.

Sowing

Seeds may be sown in the spring, either in seed beds for larger scale production or on a smaller scale in seed trays.

For a large seedbed, broadcast the seed onto the soil. Roll the seed bed to fix the seed to the bed. It is crucial for the seed to have proper contact with the soil. Lightly cover with coarse sand using a riddle. Ensure that the seed bed does not dry out during germination.

On a smaller scale sow by sprinkling thinly onto a well moistened general purpose seed compost in seed trays or pots. Do not cover the seeds with soil. If you want you can cover the seed trays with glass to prevent the seed bed drying out. Leave it outdoors in the shade (make sure it is not in direct sunlight). Again ensure the seed tray never dries out. When the seeds have germinated the seedlings can be treated as you would any vegetable or flower seed. Prick out the seedlings, holding them by the two coytledons (the first green leaves which develop from the seed). The seedlings may be planted into pots, plug trays, or prepared open ground. Young trees can then be planted out after one year's growth but it is usually safer to wait for two years.

Arbutus, the Strawberry tree – Caithne

(Arbutus unedo)

Arbutus or the strawberry tree is a small evergreen tree, which in Ireland can grow to be a forest tree reaching heights of up to 15 metres. It has an unusual distribution, as it only grows naturally throughout the Mediterranean and certain parts of Ireland. Unlike many of our other native trees, which reached us via Great Britain, Arbutus is thought to have spread here over the land bridge from Brittany.

Called the strawberry tree because of the distinct shape and colour of its fruit, this species is found mainly in Co. Kerry especially in the Killarney district where it forms a large part of the natural forest on the islands and shores of the lakes. It is also found in unshaded parts of Glengariff Wood, Co. Cork and around Lough Gill in Co. Sligo.

Arbutus produces masses of white flowers in November and December. Since the fruit takes 12 months to ripen, the tree carries both mature fruit and flowers at the same time. The fruit itsef is edible, but as the Latin name unedo – 'eat only once' – implies, it is not very palatable.

Arbutus in Killarney National Park, Co Kerry

Photographs courtesy of Dúchas The Heritage Service

Collection

The fruit ripens in late autumn and early winter, and will drop off only when ripe.

Treatment

Seeds can be removed from the ripe fruits by careful maceration and the pulp washed away.

Sowing

They must be kept moist, but not waterlogged, and unshaded.

Ash – Fuinseóg

(Fraxinus excelsior)

Ash is the commonest tree in Irish hedgerows, and is also a traditional woodland species. It will grow in a range of soils, not acid, and prefers well-drained sites. Ash woods are found in the Burren, Co Clare, and Hanging Rock in South Fermanagh. The flowers are very dark, almost black, and may be seen before the leaves develop - ash is one of the last trees to come into leaf and is one of the first to lose its leaves in autumn. The seeds are clumps of winged keys. The pale dense timber makes good firewood and is also used for hurley sticks, snooker cues and furniture.

Ash (on the left) should not be confused with Rowan, or mountain ash (on the right)

Collection

Either collect ash keys when full-size but still green during August or September; or collect when fully ripe and brown in October and November.

Storage

Stratify fully ripe seed for 16 - 18 months in sand.

Sowing

Sow those collected in August immediately although germination the following spring can be erratic.

Sow those stratified for 16 - 18 months in March or April. Ash requires a neutral soil for good growth.

Aspen – Crann creathach

(Populus tremula)

The one definitely native poplar is aspen (all other poplars may be assumed to be introduced, although the black poplar is still being argued about). Aspen will grow into a full sized tree. The leaves make a distinctive sound as they rattle gently in the wind, and they have a sweet smell in the spring. Aspen can be found in wet areas and around lake edges such as in Glenveagh, Co. Donegal. Poplars produce seeds on catkins, but also spread vegetatively by suckers i.e. new shoots growing up from the roots. It is easiest to propagate aspen by cutting through roots and transplanting a sucker. A warning should be given about planting aspen in damp sites with good soil. They sucker very readily and may spread too far, taking over too great an area. Choose aspen if you don't mind an invasion!

Growing from seed

If you wish to grow aspen from seed, you must find a mix of aspen trees. Often a 'grove' has arisen by suckers from one tree and will all be of one sex, as aspen is a single sex tree. When both sexes are present, seeds are borne on the female catkins in May. These small seeds must be sown immediately after collection, on damp bare earth, pressed in gently but left uncovered (like birch). However, as the seed is only viable for about three days it is more feasible to grow it from suckers.

Birch - Downy - Beith chlúmhach

(Betula pubescens)

Silver - Beith gheal

(Betula pendula)

There are two types of birch in Ireland, downy and silver. The most usual is the downy birch, which like silver birch is a delicate tree with fine branches and small leaves. The springtime flowers are catkins which stay on the tree and contain the mature seed by autumn.

Birch will grow in poor soils, but likes a sunny position. Downy birch is tolerant of wet sites, but silver birch needs good drainage. Birch woods occur widely, especially on marginal soils, lake edges, such as Lough Ennell Co. Westmeath, fens and on dried out bogs such as Ardkill Bog, Co. Kildare. Birch is typically associated with the Sperrins, growing in peat at the edge of bogs, and on the light sand and gravel soils. It makes a good ornamental garden tree, as it does not grow too large. Like alder, its seeds are popular with small seed-eating birds such as siskin and redpoll. In early times toghers or walkways, usually across bog land were made from birch. Nowadays, it is more commonly used in making plywood.

Birch wood

Collection

Gather ripe catkins when they are dry and are about to disintegrate. Begin testing them in August. The catkins will dry and fall apart releasing the seeds and catkin scales. Collect seeds from native woods. Do not choose birch trees in gardens, parks, or planted roadsides as these are probably imported stock.

Storage

Store the seeds and catkin scales in a cool airy place. They are best stored in a natural fibre sack. Shake the bag regularly to disturb the seeds and encourage air circulation.

Sowing

Birch can be raised from seed although silver birch is harder to germinate than downy birch.

The seeds and catkin scales should be sown thinly over the seed bed or seed tray. Roll the seed bed because the seed is very sensitive to seedbed surface conditions. Cover with a light layer of sand to help hold moisture. It must be a very thin layer as the seed is light sensitive and will not germinate if the layer of sand is too thick. Some recommend no coverage at all.

It is essential to keep the seed bed moist throughout the germination period and for two weeks after germination. Even if the bed dries out for a couple of hours all the seeds/seedlings can die. However, birch seedlings grow rapidly when they are given ideal growing conditions.

Bird Cherry – Donnroisc

(Prunus padus)

This species is most frequently found in the northwest, for example around Churchill and Lough Gartan, Co. Donegal. It is most easily spotted in the spring, around May, when the flowers are out. The creamy-white flowers are borne in rows along flower stalks about 10cm. long, and are quite obvious above the green foliage.

The dark berries or small cherries ripen in August, when the trees may be more difficult to locate, so you have to remember where you spotted them in the spring, (if you search for cherries after the 15th you may be too late!). It may be possible to mark them with a tie around the trunk. Bird cherry is worth the effort as it is an attractive small tree with true flowers and grows willingly, preferring good soil and a sheltered site.

Treat bird cherry fruit as common wild cherry.

Wild Cherry *or* Gean – Crann silín fiáin

(Prunus avium)

Cherry blossom

One of our most attractive trees, with its white or very pale pink flowers in spring, followed by hanging cherries. The bark is also attractive, and the leaves provide autumn colour. Wild cherry is very common in St. Johns Wood, Co. Roscommon.

Cherry is often found in old field hedgerows where it may have been planted by man, but is also found in mixed deciduous woodland. The old farm trees may not be native in the sense of ancient woodland, but they are part of our rural history, like crab apple and old varieties of apple, pear, plum and damson, once grown in gardens and small orchards throughout the country. It is often used as a decorative wood in joinery and furniture making.

Collection

Collect the berries as soon as they ripen from late July but in some places the birds eat them all. To collect cherries you have to find a group of fertile trees. Cherries are self-sterile and in a hedgerow or small copse all may have grown by suckers from one original tree, so they will not yield fruit. The easiest way to pick up cherry stones is from beneath the tree itself. Good big cherry trees yield the best crop.

Treatment

Remove the flesh from the seed - if in small numbers volunteer collectors often remove the flesh by eating it! Removing the flesh and cleaning the stones prevents stringent dormancy. If gathered while still hard store them in polythene bags until soft or even partially rotten. Then wash off the pulp. Once the flesh has been removed seed should be stratified or sown straight away.

Storage

Seeds can be sown immediately after collection but are very vulnerable to attack by mice and chaffinches. They are best stratified in moist sand mix until early March/April.

If seed has to be stored it should be in an airtight container in a cool place from the time of extraction to the time of stratification which needs to start in October.

Sowing

Sow them in shallow drills to the depth of the seed itself and cover with a layer of coarse grit or sand. Do not disturb seedlings until the following winter.

Wild cherry may be grown by lifting rooted suckers, but ask the landowner's permission first! Remember you need a mix for fertile trees, so transplant suckers from more than one source.

Crab Apple – Crann fia-úll

(Malus sylvestris)

Like the wild cherry, crab apple has been deliberately grown around old farmsteads (and the fruit used for crab apple jelly) but is also a truly native species found in old woodland. Crab apple is found in hedgerows throughout the country. Unlike modern hybrid apples, crab apples grow true from the apple pips.

It is a small tree, very suitable for gardens. It bears attractive pink/white apple blossom in the spring, while the apples provide an autumn feature in the garden, as well as a useful crop.

Collection

Pick the apples as soon as they appear ripe, usually in October. The pips should be extracted from the apples and stratified straight away.

Sowing

Pips should be sown in February in a sheltered site or even cold greenhouse or poly-tunnel, as the seedlings are vulnerable to frost. They should be sown in a shallow depression and just lightly covered with soil or sand.

Wych Elm – Leamhán sléibhe

(Ulmus glabra)

The wych elm is native, but many varieties of wych elm and smooth leaved elm have been introduced and planted in Ireland in the past, mostly for timber. Wych elm is chiefly found in mountain glens in the northwest of the country. English elm was mainly planted in demesnes. In recent years many of these trees have died as a result of Dutch elm disease. English elms will re-grow from stumps and will form suckers in woodland or hedgerows - these may be used for propagation.

The Irish wych elm, which is less common, appears more resistant to disease. It does not produce suckers and must be grown from seed. Leaves are rough to the touch, oval with toothed margins.

The flowers, as with many trees, appear before the leaves. They are reddish clusters borne directly on the twigs, and are not obvious until they mature into pale green seeds which almost look like leaves, except they ripen and fall soon after the real leaves appear.

Collection

Seeds may be collected as soon as they ripen and begin to fall, in May /early June.

Sowing

They should be sown immediately, watered into place before covering lightly with soil, and then kept moist. They germinate very quickly and make significant growth in their first year.

Hazel – Coll

(Corylus avellana)

A native species with many uses and an ancient history. Hazel nuts are one of the foods associated with the very earliest human settlements in Ireland of Mesolithic man, who also used hazel as the strong flexible timber for his huts. Hazel bushes may be coppiced i.e. cut right back to a stump, and will re-grow. The slender timber poles that result from coppicing were used in the construction of wattle and daub, and fences. Hazel is also a traditional material in the construction of eel and lobster traps.

Hazel grows as an under storey in oak and ash woodlands or as pure hazel woods. Hazel scrub woodland covers extensive areas of limestone, particularly on the Burren plateaus of north Clare and soils derived from limestone in the Glens of Antrim. It is often associated with a rich ground flora of woodland flowers. Hazel is well known for its yellow 'lambs tail' catkins in spring, but the nuts grow from small bud-like structures with a tuft of red - the stigma of the female flowers.

Collection

Collect from the wilder areas. The nuts are up to 2 cm long, pale green at first, ripening to pale brown and are borne usually in pairs, each between two overlapping light green bracts or husks. The first seeds shed by the tree are usually non-viable.

It is best to collect the nuts directly from the tree when they begin to turn brown. Use a tool of some sort to pull down the branches e.g. a rake or use a specialised extending claw. When they are fully ripe they will fall to the ground (or the tree can be shaken) and the nuts are then collected from the ground. But you need to be quick - it is amazing how fast wildlife will clean the woodland floor of all fallen nuts.

Treatment

Use the flotation seed testing method to ascertain which seed is viable and which is not. Drop the seed onto the water surface of a bucket of water; if the seed floats it is non viable and should be discarded. Only nuts which sink contain viable seeds.

Stratification

Hazel should be stratified for 5 - 6 months before sowing (they can be sown immediately but are always under danger of being eaten by mice, squirrels or birds). The shells will then be ready to split naturally and can be transferred to the seed bed. If they are beginning to germinate you may be able to see the bright sulphur yellow colour of the radicle through the split shell. Check regularly from February onwards.

Storage

Remove the nuts from the husk (the "involucre"). It is best to stratify them straight away. If you must store them temporarily, do so up to 4 weeks in a hessian bag, plastic onion sack, or basket which allows air to circulate. Place in a cool dark environment. It is important not to let them heat up - try never to store them to a depth greater than 15cm. If you have to store 15cm or more turn the seed regularly (i.e. shake the hessian bag).

Sowing

Use the broadcast method for growing a large quantity and then cover the nuts. Otherwise use a dibber and plant to a depth of the nut itself in a pot, container or a seed bed. It is crucial the sown nuts are protected from mice and game birds. The nutshell splits upon germination and pheasants can sniff them out and dig up the nut.

Holly – Cuileann

(Ilex aquifolium)

The evergreen holly is a native species which forms the shrub layer in some of our oldest woods. You may look for it in woodland, or in the narrow gullies of the Sperrins or Donegal uplands, where holly and rowan can survive the harsh upland conditions.

It is another visually attractive small tree very suitable for gardens as a specimen tree or as a hedge, slow growing and very dense. Holly trees are either male or female - only the female can bear berries, so it is always worth planting several holly trees together. Both sexes bear small creamy flowers.

Although they drop their spiny leaves all the year round, especially in the heat of summer, they are green all year, and along with ivy were traditionally used for mid-winter or Christmas decorations, as a sign of green life to come. In some areas it is considered unlucky to cut down holly, and it may be left as standards along a hedgerow. The hard pale wood is valued for wood carving.

Collection

Collect berries anytime over the winter (use tough gloves) from trees in wild woods.

Storage/Stratification

It is difficult to remove the flesh from holly berries. They should be stratified in damp sand and kept in a cool place for a year and sown in the second spring.

Sowing

After a full year of stratification, sow thinly in rows 15 - 20 cm apart and cover to protect from mice and birds. The following year transplant and grow for a further 1-2 years before setting out in a permanent site.

If seeds are sown without stratification, they may take 2 - 3 years to germinate. Even with stratification, germination can be erratic.

The young plants do not transplant happily, so there is a case for growing them from seed on their final growing site, or in pots after their first year.

Propagation

It is possible to take cuttings from holly. A small side shoot about 15 cm with the 'heel' where it joins the main branch should be selected and grown in a suitable sand/loam mix. September is the best time to take cuttings, which are best grown under shelter.

Seedlings or cuttings should be moved once they are well established (but under 20cm tall) and when the soil is warm. They both need to be protected from frost damage. They are also at risk from grazing live stock. Although spiny, holly is liked by most farm animals.

Oak – Dair

(Quercus spp.)

Once widespread throughout Ireland, centuries of harvesting, with few trees being replaced, means that truly native oak can be hard to find, though there are small woods in most counties. Very often, semi-natural oak woodlands contain a proportion of birch and ash, with hazel, holly and rowan scattered throughout the understorey. Oak has been harvested for its fine timber for centuries and is much prized for its visual qualities and durability. It is commonly used in the making of furniture, for veneers and in the manufacture of casks.The male flowers of oak are borne on rather inconspicuous catkins, which come out just before the leaves, but the seeds - acorns - are far more obvious. Oak trees do not produce a good crop every year, so it is worth gathering plenty in a good year.

Sessile Oak – Dair ghaelach

(Quercus petraea)

The traditional Irish oak is the sessile oak. It is the main species to be found in Ireland's most familiar woodlands. Sessile oak is found more commonly on poor acid soils, often in hilly regions. These woodlands can be found in Killarney, Co. Kerry, the Glen of the Downs, Co. Wicklow and Glenveagh, Co. Donegal, to name but a few. They are important ecologically as habitats for hundreds of invertebrate species along with many species of birds and mammals.
Sessile means that the acorns have no stalk while those of the pedunculate oak hang from long stalks.

Pedunculate Oak – Dair ghallda

(Quercus robur)

The pedunculate or English oak is also considered to be a native tree. It is generally associated with heavy lowland soils and can withstand wet soil in winter. These oak woods are found in Charleville, Co. Offaly and Abbeyleix, Co. Laois.

Collection

Remember there is not a good crop of acorns every year, so be patient. Acorns can be collected while still on the tree if they are ripe. They can be picked when the acorn has turned brown and comes away from the cup fairly easily. When the seed is fully ripe there is usually a big fall of seed. It often happens on the morning following the first frost. In tree nurseries you can often hear the question "has the big fall happened yet?"

It is also important to note that with oak (as with hazel and beech) there is a gradual fall of non-viable seed before the "big fall".

Storage

Sow straight away if possible as stored seed may lose viability. If necessary store in a cool, well ventilated place in a hessian bag. Protect against being eaten by mice. Shake the bag gently, every so often, if collection is on a large scale to prevent the acorns heating up. It is also very important that they are not allowed to dry out as they lose viability rapidly. In the New Year check every so often to see they are not beginning to shrivel. If the first signs are observed the seeds should be sprinkled with water to keep them plump until they are sown in the spring.

Sowing

One method is to sow acorns soon after collection to a depth of 10cm, leave them over winter, and then in March rake off the top 5cm to leave a 5cm covering. This protects them from being eaten, and they should shoot in May. Otherwise store and plant in late March. Allow plenty of space for the seedlings which have big leaves even when very young.

Rowan - Caorthann

(Sorbus aucuparia)

Rowan adds colour to woodland throughout Ireland, especially in the hills where it will grow at a high altitude even on rocky ground: its other common name is mountain ash.

The creamy flowers ripen into scarlet berries which colour early in the season and provide food for thrushes through the winter. A mistle thrush will defend a rowan tree or holly as its territory, not for nesting, but through the winter as its feeding territory.

Rowan is an attractive garden tree: it likes well drained sites but will thrive in most soils.

Collection

Collect from native woods or from isolated upland areas. The berries are best collected from the tree itself, before the birds eat them. Macerate the berries and then wash the pulp and skin from the seed. At this stage the viable seed will sink to the bottom of the container whereas non-viable seed will rise to the surface along with the pulp and skin.

Stratification/Sowing

If you extract the seed from the berry by macerating or fermenting and then wash the seed, removing all the red pigment, it may be planted in the first spring. Experience has shown that total extraction of rowan seed does speed up the germination process. If you want to sow in the first spring and maximise your chances of germination it is important to gather the fruits early, just as they are beginning to turn scarlet. Germination inhibitors are present in the red pigment. Stratification should begin immediately and they will germinate in the first spring.

If you gather late, dormancy is enhanced and the percentage of seeds germinating in the first spring decreases. Sow the seed that has been treated as above in March in the first spring.

Rowan can also be stratified whole and planted out 18 months later at the beginning of the second spring - this gives the most successful even germination.

Scots Pine - Péine albanach

(Pinus sylvestris)

Originally a native tree. Pollen found in soil samples from bogs indicates that Scots pine was widespread in Ireland thousands of years ago. Human impact and the gradual change to a warmer, wetter climate led to its decline, and it may even have died out completely. Pine stumps have been found in bogs, standing where they grew, 7,000 years ago, before the formation of the peat. Most of the pines around the countryside now were imported from Scotland and planted over the last 150 years. Efforts have been made to reintroduce this once native species as in some situations it is fitting that Scots pine be encouraged. It can be grown on marginal land where other species of tree would not survive. It also matures quicker and produces more versatile wood than broadleaf trees. Even though it is a coniferous tree, it nonetheless supports a wide variety of wildlife as habitat diversity changes in line with canopy closure. Our native red squirrel prefers the seeds of this tree than any other.

Collection

It is possible to grow pine from seed - the seeds are small with a single wing and fall easily from between the sections of ripe pine cones. Only collect cones in forests if you are sure they are Scots pine - most commercially grown conifers are not native species.

Storage/Sowing

Store seed dry in the fridge in a sealed polythene bag. Mix with sand mixture for stratification one month before you wish to sow in the spring and return to the fridge to stratify for one month. Then sow in fine soil, covering the seeds lightly. These must be kept damp but pine seedlings do not like to be waterlogged.

Whitebeam - Fionncholl

(Sorbus spp.)

These are small trees, quite unusual in the wild, and many imported specimens have been planted in towns and parks, along roads etc. If you want the truly native tree you may have to search - it is most common in the south of the country. Whitebeam leaves have a pale under surface, which explains its name, while the cream flowers ripen to red berries. The hard pale wood was traditionally used for small furniture such as the legs of stools.

There are several whitebeam species native to Ireland that may be found in wild woods or cliffs where they have escaped grazing. It can also be found in hedges. The most widespread is *Sorbus aria,* the common European whitebeam, which is most frequent in Co. Galway. Also found is *S. rupicola,* especially on cliffs, and *S. devoniensis,* and its distribution is restricted to Waterford, Carlow, Kilkenny and Wexford.
The distribution of a further three species is limited to certain parts of the country – *S. latifolia,* with broadleaves; *S. anglica,* which is found only in Co. Kerry and the only one unique to Ireland, *S. hibernica,* found on limestone across the midlands and in Glenveagh, Co. Donegal.

Collection
If you do find trees growing in wild woodland or cliffs collect the berries as soon as they ripen in autumn.

Stratification
Whitebeam berries, like hawthorn and rowan, need to have the red flesh removed and the seed extracted as soon as possible. If the seeds are stratified, chances of germination are improved. *(See instructions for rowan).*

Willows - Saileach

(Salix spp.)

There are several varieties of willow native to Ireland. All grow in damp soil, have catkins or 'pussy willows' that produce seeds, but are most easily grown from cuttings, which root very readily.

The most widespread willow species are the goat willow, the rusty or grey willow (both known as 'sallies'), and the eared willow. While these generally grow on damp ground, the goat willow will also colonise rough and disturbed ground in drier areas. The bay leaved willow, with glossy green leaves, is found beside small rivers and ditches.

Osiers, with long fine leaves, do not develop into large trees. They were often grown and managed by cutting right back to the base to encourage long flexible shoots used for baskets. Now this species may be grown for biomass and provide a renewable energy source.

All willows are rich in insects and so provide a good food source for insect eating birds in summer, notably for the willow warbler.

Seeds of creeping willow.

Propagation

Willow establishes easily by wind blown seed and can also be propagated by taking cuttings approx 8 inches long from stems between half an inch and one and a half inches during dormancy, which are simply pushed into the soil to a depth of 4 inches max.

Yew - Iúr

(Taxus baccata)

The yew is native and may be found in old woods although it is often seen in the artificial surroundings of estates or churchyards. An evergreen conifer (although an unusual one), yew is a dramatic tree with its dark foliage and red berries encasing a single seed. Reenadina wood on the Muckross Peninsula, Co. Kerry is Ireland's only native yew wood.

Yew topiary

A sport (unique form) of the Irish yew (Taxus baccata 'fastigata') with very upright growth was originally found growing on rocky limestone hills in Co. Fermanagh. This was cultivated at Florencecourt, and subsequently in many gardens and churchyards.

Many yews are single sex, but most Irish yews are female and so bear fruit. Even if the flesh is removed, these may be slow to germinate. The best seeds are those that have been eaten by birds and have passed through them; such bare seeds may be collected from under yew trees.

There are ornamental garden varieties, some with yellow fruit or even golden foliage - these have to be propagated by cuttings.

Yew trees do not need rich soil but they do need a well drained site, preferably not too exposed to wind or frost.

The leaves are poisonous to most livestock, and the seeds are also toxic, so care must be taken in planting it where animals and children are not at risk. The fruit can be eaten safely by birds, and yew is in fact a good tree for wildlife as birds roost and nest in it.

Collection

Fruits may be gathered as soon as they are ripe and brightly coloured. It is best to collect seeds from a group of yew trees in woodland. For a small number of seeds, you could try collecting under the trees for those left in bird droppings.

Stratification

Remove the flesh. Seeds may be sown straight away but germination is uneven. They are better stratified for at least two seasons.

Sowing

Sow in early spring after the second winter of stratification. Seedlings are slow growing and can be left on site for two years, then lined out at 30cm apart for a further two years before placing in permanent sites.

Propagation

Yew can be propagated by cuttings, taken in September but this is generally used for garden species which are not fertile.

Chapter Three - Shrubs

Blackthorn - Draighean

(Prunus spinosa)

Spiny shrub of roadside and hedgerow, blackthorn forms dense scrub cover where it is left untrimmed and ungrazed. It bears dense clusters of small white flowers, which contrast with the dark bark of its twigs, very early in the year. Blackthorn hedges can appear to be covered in white.

After the flowers, the small oval leaves appear, and then in autumn the harvest of sloes develops. These look like small damsons, but are very sour and are not eaten directly by people, although birds take them. Sloes have traditionally been used for flavouring gin or poteen. The use of blackthorn wood is mainly decorative, for example the manufacture of shillelagh walking sticks and tourist souvenirs.

Collection

It is easier to collect sloes in late September/October when the leaves have fallen and the fruits are more visible. Use gloves if collecting by hand. It is possible to collect from the ground after shaking the tree once the fruits are blue/black. Only collect from your local area in old hedgerows.

Storage/Stratification

Remove flesh/partially rot if necessary. Store stones in moist sand, outdoors, protected from mice.

Sowing

Sow in nursery rows in late winter/early spring and allow seedlings to grow undisturbed until the autumn. Chaffinches are notoriously fond of the tasty cotyledons! Plant out at one year old 25 - 30 cm spacing apart and they will be ready for permanent sites in one more year. Blackthorn is easy to grow on any well-drained soil, and prefers a sunny position. It is best planted out young as many fail at the transplanting stage.

Bramble - Dris

(Rubus fructicosus)

Bramble is a tough colonising plant and is notorious for rapid growth of stems, which reach out from a hedgerow to colonise new ground - they are unusual in that when they touch the ground the tips can form new roots and start a new plant.
These rooted branches are called 'stolons'. It is easier to cut off and transplant a rooted section rather than to grow plants from seed.
Brambles have flowers that are attractive to insects, and the blackberries provide food for insects, birds, and mammals (including humans!). If you need to cover rough ground, which cannot be cultivated, brambles are an excellent choice.

Broom - Giolcach sléibhe

(Cytisus scoparius)

Broom is sometimes confused with gorse, because the yellow flowers are a similar shape. However, broom has a few soft leaves on the long straight stems, not spines; it grows on light sandy soils, and it only flowers in mid summer.

The flowers are followed by seeds in miniature pea pods which dry and split open to scatter the seeds. On the right soil, broom can spread rapidly, for example disused sand and gravel quarries.

On light soils, it is a good shrub component of woodland on a sunny south facing bank. If it is to be grown as an ornamental shrub in gardens, it needs to be cut back or after a few years becomes too leggy and tends to collapse.

Collection
Pick the dry seed pods in late summer/autumn.

Storage
Seeds may be taken out of the seed cases and sown straight away or stored dry in an airtight container over winter.

Treatment/Sowing
The seeds have a particularly hard seed coat, and to achieve successful germination this has to be breached. One way is to take individual seeds and rub them with sand paper or rough emery board until you can just see the paler material inside the dark seed coat. It only needs to be breached on one spot.

Alternatively, seeds may be treated by pouring boiling water over them and leaving to cool.

Once the seeds have been treated, plant them individually in pots or plug trays in light soil.

Buckthorn - Paide bréan

Purging *(Rhamnus cathartic)*

Alder *(Frangula alnus)*

Purging B.

An uncommon shrub, which grows at lakesides often on limestone soil around the shores of Upper Lough Erne and the Shannon, Lough Neagh and Lough Beg. It is not tolerant of heavy shade under trees or very dry sites. There is some resemblance to dogwood (it is sometimes called 'black dogwood'), but the oval leaves have an unusual pattern of almost parallel veins. The inconspicuous white-green flowers (not unlike spindle flowers) are borne close to the dark branches and are followed by clusters of black berries on the female bushes only. This buckthorn is single sex, with about seven female bushes to each male.

Collection/Sowing

Pick the berries as soon as they are ripe in October, extract the seed, and stratify immediately. Some bushes crop much more heavily than others. In order to ensure your own crop of berries, you need both sexes present: because of the odd ratio of females to males, you need to plant a dozen or so bushes.

Alder B.

Alder buckthorn was once common, coppiced and the wood used for charcoal. It is a bush of wet, though not waterlogged sites and is found around the shores of Lough Ree. It has a very long flowering season and long fruiting season from July to November.

Collection/Sowing

Pick berries as soon as they are ripe, extract the seed and stratify until March when they should be sown shallowly. Keep the seedbed moist.

Dog Rose - Feirdhris

(Rosa canina)

The Wild Rose of Summer celebrated in song and verse, the flowers are typically found in long established hedges where they enliven our roadsides with their large blooms, which vary in colour from white to deep pink.

In autumn the rose hips develop, colourful red containers for the small seeds within. Small birds are able to extract the seeds, in spite of irritating protective hairs within the rose hip. Other species, and small mammals such as field mice, eat the flesh of the rose hip itself.

Traditionally, they were harvested and used for rose hip cordial, syrup or wine. Rose hips are a rich source of vitamin C.

There are a number of other less common species widely distributed around the country. Among these are the Burnet rose (*Rosa pimpinellifolia*), a small wild rose, is found on coastal sand dunes and at a few inland sites also. It has a cream flower followed by very dark hips. It can be grown in free-draining sites in gardens, but should perhaps not be introduced outside its normal habitat.

Collection
Wild rose hips may be collected from hedgerows in the autumn, though gloves are essential!

Storage
The hips may be stored over winter, but will need to be checked to ensure they do not go mouldy.
The seeds must be extracted from the hips (which may be squashed) and then sown straight away but they will not germinate for two winters. They need to be stratified over two winters before they will germinate.

Propagation
Rose plants may literally be split to form several plants. They will grow suckers if cut back to the roots and these suckers may be transplanted. It is also possible to drop or layer branches, which will root, or to take cuttings.

Elder - Trománn

(Sambucus nigra)

Sometimes known as the Bour tree, this is a common shrub around the countryside and often found beside old farmhouses or byres, especially associated with old refuse tips or middens where it appreciates the extra nutrients in the soil. In the wild, it may be associated with badger setts.

The idea of deliberately planting elder trees - which grow again if they are chopped down, and spread rapidly on waste ground - may seem incredible to older country people. However, elder is a very good wildlife species, with its wide heads of creamy flowers followed by hanging clusters of dark red/black berries.

As with all other species, the truly native variety has the most wildlife value (ornamental varieties are used in landscape planting). Elder seeds germinate willingly, and the tree will grow in most soils.

Both elder flowers and berries may be used in cooking and for making wine. The branches have a soft pithy centre that can be removed and a section used for homemade flute or whistle. In nature, such hollow branches provide nest chambers for bumble bee larvae, and shelter for hibernating insects.

Collection

Collect berries as soon as they are ripe, usually in October.

Treatment

The berries may be soaked and macerated or fermented to remove the flesh and release the small dark seeds.

Sowing

The seeds should be sown immediately after extraction and lightly covered with soil or stratified until March.

Gorse - Aiteann

(Ulex europaeus and Ulex gallii)

Perhaps the best known and most widely distributed of our native shrubs, gorse is also known as whin or furze. There are two types, the common or European gorse, and the western or mountain gorse. The common gorse is a very suitable shrub component along the edge of new woodland, and also makes an excellent hedge.

Gorse is well known for flowering almost all the year round, and its spiny 'leaves' are evergreen. Gorse supports many insects and spiders, which in turn provide food for small birds, which may nest in the excellent shelter provided by these dense spiny bushes. It is often under-estimated as a wildlife resource. The flowers were traditionally used to colour Easter eggs, and may even be used for wine.

Collection

Gorse seeds may easily be harvested by picking the soft brown seed pods in late summer.

Sowing

The seeds should be extracted from the pods and treated as for broom. They are best sown in a prepared seedbed on their final site, or grown in pots - bare root seedlings do not transplant well. Gorse seedlings are frost sensitive and prefer well drained sandy/acid soil.

Guelder Rose - Caorchon

(Viburnum opulus)

Not a rose at all, but this is certainly one of our most attractive wayside shrubs. Guelder rose is usually found in hedges or at the edge of fields and small woods beside a drain - it needs damp.

The flowers are a disc of creamy blossoms, larger at the outer edge. These are followed by translucent bright red berries, which colour early in the autumn, which is when this shrub is most obvious.

Collection

Ideally, gather fruits before they are fully ripe, red and soft, otherwise they can become a bit mushy. Collect the fruits by hand picking or stripping branches.

Storage/Stratification

Store fruit in polythene bags until over-ripe or rotten. Separate flesh from seeds and clean in water. Because of their variable germination time, they are difficult to stratify in the usual way.

Sowing

Instead, sow seeds immediately after cleaning in seed trays or a sheltered seedbed and cover with 2cm light soil. Never allow them to dry out. Germination is variable, erratic and unpredictable and some seedlings may not emerge for 3 springs following sowing or they may germinate straight away!

Line out 15 - 20 cm apart the following autumn after emergence.

Hawthorn - Sceach gheal

(Crataegus monogyna)

Hawthorn or white thorn was planted in hedges throughout our countryside. Its sweet smelling 'May' blossom is a feature in that month, and in autumn and winter the deep red haws colour the bare twigs. They are among the berries most favoured by birds. Only untrimmed hawthorn can flower and fruit freely, but hedges have to be cut to keep them stock proof.

Hawthorn hedges may be trimmed regularly, or left for several years and then laid by cutting part way through the main stems and laying these horizontally through the hedge. Even old hawthorn hedges will regenerate if trunks are cut back to base and left to sprout again, but these must be fenced off so that farm livestock cannot reach the tasty young shoots and eat them.

Like many other shrubs, hawthorn also grows in woodland where there is enough light - in open glades, along 'rides' through the woodland, or along the edge. A single tree may be left in a field as a 'fairy thorn', especially where there may be an archaeological site.

Collection

Hawthorn is abundant in most areas. Haws should be collected as soon as they are ripe (use gloves).

Stratification

Remove the pith from around the stone by hand or by rubbing with a heavy object on a flat surface. Stratify for 16 months. If seed is not stratified, but sown straight away, it will not germinate until the second, or even third spring.

Sowing

Stratified seeds should be sown thinly in nursery rows and the resulting seedlings left for 1 - 2 years until ready to transplant and grow for a further 1 - 2 years before setting out in permanent sites.

May blossom

Honeysuckle - Féithleann

(Lonicera periclymenum)

A climber rather than a shrub, honeysuckle is a common component of native deciduous woodlands. The heads of pink and golden trumpet shaped flowers have a powerful sweet scent attractive to moths, which take the nectar. The flowers mature to bright red berries that are much enjoyed by birds such as coal tits. Honeysuckle may be grown on a fence or over dead timber, or up the wall of a building with the help of wire supports. It may be cut back and trimmed hard in a hedge without ill effects. Honeysuckle will grow from berries and also from cuttings. Best of all is to 'layer' a branch i.e. peg it down into the soil while still attached to the parent plant - it will sprout roots and may then be cut off and transplanted.

Ivy - Eidhneán

(Hedera helix)

Another climber, this one evergreen and self supporting, and so even better than honeysuckle for screening unattractive fences and buildings. Ivy produces its pale yellow flowers in winter, food for the few winter-flying insects, and its berries ripen in spring when they are an important food for blackbirds and thrushes.

A good wildlife plant, it may need to be controlled in woodland. Ivy is not a parasite and will not directly kill a tree, but its sheer weight may make a tree more liable to wind blow. Ivy grows easily from berries and small rooted branches may also be transplanted.

Juniper - Aiteal

(Juniperus communis)

An unusual shrub found in rocky areas, especially on the Burren and in West Donegal, and often at woodland edges. One of our few native evergreens, juniper is generally found on limestone. It will thrive in other soils and could be introduced to areas outside its natural distribution, however, this may not be considered desirable. In good conditions it may grow to be small tree size.

Like holly, juniper is evergreen and bears flowers of different sexes on different plants. The bushes are small and usually low growing, the fruit black, and it can be grown from seed. The berries are used commercially to flavour gin.

Propagation
Juniper will grow from its berries but is easily grown from cuttings.

Juniper growing on limestone, Co Donegal.

Spindle - Feoras

(Euonymous europaeus)

Another bush more common on limestone soils though it is tolerant of a range of non-acid soils. It shares its most common areas of distribution with the guelder rose.

It is an inconspicuous shrub with pale bark, smooth and pointed leaves, and small pale flowers. Young twigs are green and four sided. It is the fruits that are amazingly colourful with bright pink cases that split open to reveal hard orange seeds. It will grow from seed but may also be propagated by cuttings. The hard pale wood was used for making spindles for spinning wheels and looms - hence the name.

Collection

Collect the brightly coloured fruits in autumn either by picking or gently shaking the tree.

Treatment/Stratification

Discard the pink fruit and gently rub off the orange seed coat by hand before sowing. This is tedious but means that seeds may be sown straight away and germination is more reliable than after stratification. However, if you have a lot of seed and hand preparation is too time consuming, the seeds should be stratified for six months.

Sowing

Sow immediately after collection or in March following stratification. Cover with a thin layer of coarse sand. Germination is extremely variable. Wait and hope!

Propagation

Spindle may also be propagated from cuttings although it is not very ready to root (see advice for holly).

Chapter 4 - Growing trees and shrubs

Growing trees and shrubs

Setting up a Small Tree Nursery.

Setting up a mini tree nursery, whether in your back garden or on a window sill, is a particularly interesting and rewarding pastime. Before you start, decide how much time and space you want to dedicate to the project. Your nursery may initially be a few flower pots or seed trays, a section of vegetable plot or flower bed, or in a prepared seed bed.

Small Scale Tree Rearing

1. Just a few trees

Most people start on a small scale - even a yoghurt pot on a window sill. You need some simple pots, preferably with small holes for drainage or a seed tray. The soil should be free-draining; most garden soil is improved by mixing in sand and compost or leaf mould, or you can buy potting compost (referably peat-free to save our bogs).

Fill your pots with compost and sow a few seeds not too deep (see advice for each species). Keep them sheltered, not too hot or cold, and remember to water them on a regular basis.

Once the seeds germinate, keep watering and weed carefully once you are sure which are weeds and which are young trees!

After a few months, the trees will outgrow their pots and will need more space and depth for their roots. At that stage you will need to plant them out into a prepared bed or into larger pots/containers. The young trees could even be moved into cleared ground at their final site, so long as the young plants will be looked after - weeded, watered and protected from being eaten. This is good for species such as holly, blackthorn and gorse, which are not very successful when transplanted as larger seedlings.

If your aim is to produce relatively small numbers of good young trees, and you have accesss to a cool greenhouse or poly tunnel, here are two good systems.

2. A tried and tested system

Rootrainers. These are moulded plastic pots or cells which come four or five to the set, or 'book'. Because the books are hinged and can be opened out, it is possible to observe soil condition and root systems without harming the seedlings and to remove the plants easily when they are ready. The lengthwise grooves in each cell promote straight root development. They range in size from 8-20cm in depth and 65-350ml in volume; a 1000ml-volume cell is now also available. Rootrainers arrive flat and opened out. They should be closed and placed in 36x21x9cm trays ready for filling and sowing. The number of books per tray varies between 8 and 14.

3. Another good way

Collect your seeds, stratify as necessary (see advice for each species) and sow in shallow seed trays using a peat substitute potting compost.

Once these have germinated and grown a little, pick out individual seedlings - handle with care, preferably lifting them by the cotyledons, the first green 'leaves' - and transplant into plug trays (available from garden suppliers) one seedling in each plug section.

Keep the seed trays and plug trays in your unheated greenhouse or poly tunnel.

In summer, the seed trays should be taken outside to harden off for at least one month. They are then ready to be planted on site. The use of plug trays seems to give seedlings a really good fast growing start.

Your first 'nursery' may be a few pots on the kitchen window sill.

Rootrainer (Sherwood size) 'book' shown opened out.

8 Sherwood-size Rootrainer 'books' fitted into tray, shown after sowing.

Using seed trays to germinate rowan.

Acorns are fine for planting on the spot.

Compacting soil removes any air pockets.

4. Plant 'on the spot'.
There is one more option, which is that seed may be sown directly on the site where you want your final tree or bush. This avoids any problem with moving young plants. Prepare the site as you would any seed bed and plant several seeds - this should ensure that at least one germinates successfully. Later you can select out the best young plant to grow on, and move the others.

Remember to put in a marker and ideally cover the sites with wire or other mesh to mark and protect it. Keep watering - don't forget about your tiny seedlings!

Digging the bed.

Raking is very important.

The finished bed ready to plant.

Larger Scale Tree Rearing.

If you have suitable land, and enough time and energy, you may consider a full scale tree nursery. Even a small nursery can yield hundreds of trees each year.

Choosing the Site

When choosing the site, keep in mind these important factors.

1. The site should not be waterlogged - a raised bed with coarse grit incorporated in the soil will provide adequate drainage.
2. Water will be required for summer watering.
3. Shelter is needed from the morning sun and strong wind on frozen foliage. Do not use an east facing slope.
4. Protection against morning sun on dewy leaves is essential as the scorch can kill seedlings.
5. Protection from dogs, children, footballs and rabbits. If a rabbit proof fence is required use a 31 mm gauge wire and bury the bottom 30 cm under ground level.

Site Preparation.

Preparation of the site can be the most time consuming part of growing trees from seed, but it is absolutely worthwhile. The better the site preparation, the better the germination and growth of young trees.

Once the site has been selected, it must be cleared of grass and weeds. Remove the grass by paring away the top three inches of soil and grass roots. Stack these shallow sods off to the side as next year this will be a fine compost for a seed bed. Perennial weeds such as dandelion and dock must be removed from the soil, otherwise they will grow up through your seedlings, smothering and starving them.

Dig over the soil to a minimum depth of 25 cm, removing larger stones and weed roots. If this is done in the autumn the winter frost will break up the soil further. Should the soil be heavy and sticky, dig in some sharp sand or grit. This will aid drainage and render the soil more workable. If the soil is sandy incorporate well rotted old manure or compost to give a firmer texture and help it retain moisture. With the site selected, fenced and dug over,

the next stage is the growing beds. This is simply soil raised to approx. 10 cm above ground level, flat topped, about 1m wide and as long as your enclosure allows. Be sure to leave a narrow path around each raised bed for easy access and weeding.

Shape the bed by putting a string line where you want the edge of the bed to be. Cut a flat bottomed channel down one side of the line and deposit the soil on the opposite side of the line. A path has just been created! Shape the bed. Level the soil. Walk over the surface of the bed on your heels, or roll it, then rake the bed's surface. Repeat this process until the surface is firm and fine. This will ensure the bed does not sink and sag due to there being air pockets present. You are now ready to plant seed.

If the bed is made earlier in the season, weeds can be eliminated before sowing in the autumn or spring. Some nurseries use herbicide and/or soil pesticides.

Planting Seed

Dibbling

Hazel and oak are suitable for this method. Large seed can be planted by piercing a hole, with a round nosed dibber, twice the depth of the seed. Drop the seed into the hole and cover with sieved sand or soil. Firmly compact the medium to eliminate air pockets.

Broadcasting

Small seeds are planted in a similar manner to grass seed, i.e. scattered evenly by hand on the surface of the seed bed. This is then followed by rolling the bed and covering the seed with 2mm sand. Birch is sometimes uncovered as it is light sensitive. Treat stratified seed in the same way as seed sown fresh.

If weeds appear on the seed bed gently remove them by snipping or slicing the root under the soil surface with a sharp knife. If you have any doubts as to whether it is a weed or a tree postpone weeding!

Protection

Seeds and seedlings are vulnerable to being eaten. In the seed bed they can be protected by erecting a frame over the lines of seeds/ seedlings.

Small mesh wire netting may be used or better still a fabric mesh such as Mallardworth black 1in. stretch netting. This can be spread over wire hoops well down into the ground and pinned down at the sides with short stakes. It is necessary to have a good seal at the side and ends of the rows, especially if mice are your problem!

Lining Out

After one year in the seed bed, the small tree seedlings will have grown substantially. They will appear crowded, especially if they have grown from small seeds which were originally broadcast quite thickly.

It is necessary to move them on to the transplant bed, prepared and weeded as recommended in 'site preparation'. The little tree seedlings should be lifted gently from the seedbed without damaging the roots, and transferred as quickly as possible to their new area. If they have to be left for a short time, cover the roots - damp newspaper is a good idea.

"Dibbling".

Broadcasting with birch seed.

Rolling the broadcast bed.

Lining out.

Protection for hazel is vital to keep out mice & birds.

Root pruning promotes healthy growth.

The colour difference at the base of a seedling marks the depth for planting.

Make a hole with a 'dibber' for each seedling, place it gently in the hole and press soil around to the same level as it was growing before - too deep or too shallow will check growth and may even cause the young tree to fail. Plant in a straight row and leave regular spaces of about 30cm. between seedlings - which will make clear why this process of planting on is known as 'lining out'.

If the seeds were originally sown well spaced out - acorns, for example - the tree seedlings may be left for two years in the seed bed and then lined out.

The transfer of tree seedlings is normally carried out in the autumn and winter, not in spring when they are actively growing and even more vulnerable to disturbance. There is one exception - holly seedlings actually like to be moved in the summer, when the soil has warmed up!

Root Pruning

When tree seedlings have been grown under crowded conditions in the seed bed, their root systems may be too 'up and down' and not sufficiently all-round. To encourage bushy root growth, which leads to a healthier and more stable tree in the long term, young seedlings may be 'root pruned'.

Root pruning is carried out when the young seedling is lifted from the seed bed. The roots are trimmed, using large scissors or secateurs, just cutting across the largest roots so that the tree is left with a more even length of main roots. This encourages the cut roots to send out side roots, in the same way that a cut branch above ground will send out side shoots.

In commercial forestry nurseries the young tree seedlings have their roots pruned by a cutter bar when they are still in place in the seed bed. On a smaller scale, we can lift and trim roots of a small bunch of tree seedlings held together, but you may wish to carry out a precision job on each individual seedling - it is up to you how much time you wish to spend on this task.

Root pruning is not necessary for seedlings which have been grown in individual pots or plug trays, but it does assist seedlings grown on a larger nursery scale to make good growth subsequently. The result is a large root surface and a comparatively small shoot. This favourable root/shoot ratio is ideal for transplants. It may look severe but it is for their own good in the end!

Looking after your Seedlings.

Attention must be paid to their general state of development. Check for mildew and aphid infestation regularly, and use chemicals if you need to. Oak and hawthorn are especially vulnerable to grey leaf mould infections.

Water beds if it has not been raining for a few days. (Daily for birch when very young).

In the autumn defoliation occurs and dormancy commences. This is the time to transplant seedlings - gently.

At the base of each seedling there is a colour difference. This is the planting depth for each seedling.

If planted too deep the seedling will die.

Dibber or trowel planting is used at this stage. Do not "corkscrew" the roots into the hole or the tree roots will become twisted and distorted.

The planting season generally finishes at the end of March. Seedlings can be moved at other times if they are re-planted rapidly without the fine roots drying out.

Growing from cuttings

Most species may be grown from seed, but we have mentioned some which propagate easily from cuttings or by layering shoots: these are forms of vegetative reproduction. Unlike sexual reproduction from seeds, which is the union of pollen (male) and ovule (female), vegetative reproduction allows no genetic mixing or diversity. All the young plants are genetically identical to the parent.

Cuttings are often used for garden species which may not be fertile, for example plants which do not grow naturally in our climate, or when it is important that all plants should be exactly the same.

For some of our native species, it is the easiest way to propagate large numbers and is especially used for willows. To take cuttings first cut a young branch, one or two years growth, from your parent tree or bush. This is generally done in autumn or winter.

A strong sharp pair of pruners is essential for good quality cuttings. In a nursery set-up this task is carried out indoors on wet days when other work would be awkward. A branch or shoot of willow can be up to 2.5 metres long in one or two years and therefore ten or so cuttings from each one is possible. Each branch is removed by executing a straight cut, just below a bud, at its base.
Next any old leaf growth or side branches are cleared neatly from the shoot. Growth thinner than pencil thickness at the top of the branch is removed, being too thin to be suitable. Cuttings can be from 15 - 24 cms long, making sure each one has at least three buds on it.

Proceeding from the base of the branch upwards a straight cut is made just under a bud; then six or nine inches up a slanted cut is made just above a bud. Following each top cut a short piece of waste wood is removed when moving up to the next base cut. The slanted cut at the top serves a few purposes among which are -

1. making it obvious which is the bottom end when planting.
2. prevents water lying on top of the cutting which can cause rot.

The 'pegs' can be planted straight away. The flat base end is pushed into the soil to half or two thirds the depth of the 'peg'. Mulching is easy with cuttings as it can be carried out before planting if required (see section on Care of Young Trees). Cuttings can be 'heeled in' as a storage method if required: damp coarse sand is ideal for this.

Note: The use of one pointed end and one flat surface is generally accepted, but some nursery men use them the other way round - the pointed end is pushed into the soil so you are pressing on the flat end, which is pushed in at an angle so that it will shed rain. It doesn't matter which way you choose to do it, so long as you get the cutting the right way up, i.e. with buds ready to grow upwards!

Cutting a shoot.

"Pegging out".

Willow

Chapter 5 - Planting trees

Planting trees

The root hairs absorb the nutrients.

When and how to plant

Most tree and shrub seedlings will spend their first year in the seedbed - more if germination is delayed or growth very variable or slow. After replanting in the transplant bed, where they have more space, the trees may be left for a further one or two seasons, depending on growth and size, which is usually related to the type of tree i.e. the species.

Some species transplant easily - others, such as gorse, holly and blackthorn do not transplant well and are best sown on site or moved to their final site as very small seedlings. Moving young trees is always stressful for them - the faster it can be done the better, without damaging the tiny root hairs or allowing them to dry out.

The normal planting season extends from October till the end of March. Do not transplant in heavy frost, and take extra care in cool, drying east winds.

Transplanting is stressful for all young plants. They should be replanted in prepared soil, then well firmed in at the same level as they were before i.e. the same position between roots and trunk - there will be a colour change to guide you. Dig a good sized hole and spread the roots out, not leaving them squashed or twisted.

If your young trees have been grown in pots or containers, they may be left until they are older and planted out keeping the complete mass of roots and soil together. Do not leave them in pots too long, or the roots become cramped and there is real growth check before the roots spread out in their new site, which allows growth to begin again.

We tend to think of roots as big strong parts of the tree which anchor it to the ground, but as with other plants, it is the fine delicate root tips and root hairs which do the main job of absorbing water and nutrients - if they are damaged or cut, the tree cannot grow as well. (When root pruning only the longest roots are cut, leaving the side roots to form a healthy mass of new rootlets which increases this absorbtive area).

If the trees are left for four years or more in their nursery beds, they get beyond the stage of easy transplanting and the chances of moving them successfully decrease sharply. Some species are more tolerant than others. Birch should be moved young, oak and rowan seem to be able to survive later moves.

The same principles apply to cuttings, which should be moved carefully taking soil with the roots if possible. Willows are often planted on the final site, directly into wet ground, which means they do not have to be moved at all - the easiest way! Always water young trees and cuttings soon after re-planting.

Trees planted with guards and supports.

Remember to loosen the ties.

Ring barking - strimmers kill trees!

Where to plant your trees

You may be growing trees from seed with a clear idea of where you want to plant them. In many ways this is ideal, as you can choose the species most suitable for the site you have in mind. You may be growing trees in order to supply other people, schools, community groups, or local nature reserves, in which case local provenance has a particular value.

Always check that the area you have in mind is not important for conservation as it is, in which case trees might actually detract from the wildlife value. Peatland and bogs should mainly be left unplanted.

We have tried to suggest which species are more suitable for small spaces or gardens, where you will only need a few trees or even one specimen tree. Even if you only want one to last, it is worth planting several and then selecting out the best while transplanting the rest.

You need to plan for how long a tree will last and how much it will grow - do not plant close to walls, buildings or historic monuments, as all these may be damaged by tree roots. Always over estimate the space trees will need above ground and below, because roots spread beyond the canopy in order to collect rain dripping off leaves all around the tree. Once planted, tree roots should not be disturbed.

Care of young trees

Young trees do best if they are given a good start. After all your care in collecting seed and rearing young trees, it is all too easy to lose them once the time comes to plant them out in their final site. To avoid this disheartening outcome, spend some time on site preparation just as you did for the seeds and keep an eye on the young trees.

Good soil can be improved by cultivation, thorough digging and mixing in compost or farmyard manure if available. Thick grass and weeds should be cleared from the planting site, either by cultivation or use of herbicide, which if it is long-lasting will also prevent re-growth around the young tree.

Planting into good soil, already cleared of other vegetation, is ideal. If trees are to be planted in sub soil or rubble, provide them with good top soil in a pit around the roots to get them started. If you have to plant into dense grassland, clear or kill a small area before you put the trees in place.

Use of a mulch - dark plastic or organic matter such as wood chips - around the trunk will keep the ground clear of competing vegetation and help conserve moisture. Even in Ireland, many young trees die from lack of moisture. Water young trees at planting and keep on watering during the first summer in dry weather.

Grass and other small plants compete for water and nutrients.The worst thing you can do is to cut grass around young trees as this will encourage the grass to re-grow and take even more from the soil. Never use strimmers near trees - they are most effective at 'ring barking' small trees so killing them.

So long as growth of grass and other plants is not too vigorous, trees should outgrow the competition. But remember to clear around trunks while they are getting started, to allow the trees to grow straight and true. If you care for your trees in the early stages, they will repay you by growing well.

Trees do not generally need fertiliser - after all, they are natural vegetation and should be able to grow naturally. If you do think it is needed, low nitrogen types like potato fertiliser are best.

They do need the soil to suit them: alder and willow can tolerate very wet conditions, birch grows on acid soils, shrubs such as spindle, guelder rose and buckthorn seem to prefer limestone soils, rowan and gorse need well drained ground.

Always consider the 'appropriateness of place' when considering what trees to plant where. Seek advice if you are unsure.

Planning your woodland

If you are fortunate to have enough ground to plant a number of trees, for conservation reasons you should aim to create a woodland as close as possible to natural woods in your area. Take a look around, and see what grows there naturally. You have probably done this to begin with, in order to identify trees from which to collect seed.

Some woods consist of very few tree species. Birch woods on acid soils, ash woods on limestone, are examples of woods which are almost single species. If you are planting a difficult site, very wet, or with acid soil, your choice of trees will be restricted.

However, on better soils you have more choice. Aim for a mixture of trees to give final height such as oak and ash, with shrub species for variety - hazel, hawthorn, etc. Allow plenty of space between trees and shrubs, because shrubs cannot thrive in heavy shade. If there are any trees and shrubs present on the site to begin with, try to keep these and incorporate them in the new planting. They may provide shelter for your new young trees.

If you have poor spindly trees on site, for example ash or hawthorn, these can always be coppiced - cut back to the stump and allowed to re-grow. This will give young bushy growth and re-juvenates the trees.

Ideally, a wood should have trees, shrubs, and flowering plants below.

If you are planting next to an existing wood, the woodland plant species will naturally colonise. Areas under trees are increasingly shaded as the trees grow, so that meadow grasses and plants are shaded out and only early flowering or shade tolerant woodland species will be able to thrive. You can speed this process by transferring a few spadefulls of woodland soil in winter time, complete with roots and bulbs. Or ask permission to take some plants from another existing wood on similar soil: bluebells, wood sorrel, wood anemone, lesser celandine etc.

Planting young trees close together encourages better growth rates and straight trunks, but it does mean thinning in 15 - 20 years time. However, it is possible to plant in several groups, leaving open land between if you can afford the space, or to leave generous open glades or rides within a single planted area.

A mixed woodland always provides the most variety of colour and wildlife.

Wood anemones - a beautiful wood is not complete without a carpet of spring flowers.

Trees need protection from grazing deer.

Rabbit-proof fencing: netting overlapped horizontally in the direction of attack.

Remember to label your seedlings!

If you leave more space between trees you will have to do more weeding to ensure good growth, but it will reduce the necessity to thin out your planting in future years - people dislike destroying trees they have grown and planted, but the timber may be useful for firewood, fencing, etc.

The purpose of open glades is not only to allow extra room for tree growth, but also to encourage plants that need the extra light. These attract insects, birds, and mammals. Research has shown that it is the woodland edge which is most used by birds rather than the centre of thick woodland. If you walk along forest paths you will often see traces of badgers and foxes, although their setts or earths may be hidden within the wood.

Tree Shelters and Pests

Tree shelters are made from various materials in a variety of forms, square or rounded: some are manufactured locally. Shelters are used as protection against wind and weather, as a marker to remind you about small trees, and to deter rabbits, a common cause of destruction. Shelters are very worthwhile for a few young trees. Oak seems to benefit particularly, but some species, such as birch, do not thrive in shelters.

If you are planting a larger area, it is worth erecting rabbit proof fencing around the perimeter rather than buying lots of tree shelters. Hares may also be a problem, and they require 15 cm shelters rather than the usual 10 cm to protect the trees.

If you have deer locally, you may have real difficulty in establishing trees. One way is to plant one of their favourites, such as willow, in a dense band all around the outside of the planted area - this is a 'sacrifice crop' which should protect your final woodland in the centre. Deer are not generally a problem in gardens here, but they do restrict regeneration of woodland where they are present, and will feed some distance from their home forest or estates.

Grey squirrels can be a problem and are very difficult to exclude!

Insect pests have to be watched for in nursery situations, but once your trees are planted out as woodland, natural control and a balance of pests/predators should become established.

Record Keeping

Do keep records of all that you do - when and where you collect the seeds, how you treat them, how well they germinate and grow. The records will prove valuable to you in accumulating knowledge and may provide useful guidance for other people.

Perhaps because our woodland tradition in Ireland is not strong, we have lost some of the older skill in rearing trees. This guide reflects the experience of several groups and individuals, but we all have a lot more to learn - you can make a real contribution.

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Sources of Further Written Information

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Useful Addresses

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Department of Agriculture & Food,
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National Parks & Wildlife Service
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Heritage Council
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Glossary

Afforestation: the growing of trees in an area that has lacked forest cover for a very long time or has never been forested.

Atmosphere: the whole mass of air surrounding the earth.

Atmospheric: material found in the atmosphere.

Ancient Woods: those occupying sites that have been wooded continuously for several hundred years at least since the time when the first reliable maps were made.

Biodiversity: a concept that refers to the variety of all life forms at all levels including genetic diversity, species diversity and landscape diversity within an ecosystem. Maintaining biodiversity is crucial to sustaining the interrelated web of life of any ecosystem.

Biomass: the dry weight of all organic matter in a given ecosystem. Also refers to plant material that can be burnt as fuel.

Broadleaves: generally deciduous hardwood trees. Their leaves are flattened and usually broad in shape with a network vein pattern and are mostly light green and soft to the touch. Oak and ash are examples of broadleaves.

Canopy: the forest cover of branches and foliage formed by tree crowns.

Canopy closure: the lessening of space between the crowns of trees as they spread sideways or laterally. This increases canopy cover.

Carbohydrates: organic compounds such as sugars and starches composed of carbon, hydrogen and oxygen.

Carbon dioxide (CO_2): a gas that is present in the atmosphere and is formed during respiration. An essential ingredient in the process of photosynthesis.

Community: all the living organisms in an area at a particular time that affect one another as a part of the food web or through their various influences on the physical environment.

Conifers: evergreen, softwood trees. All conifers produce seed bearing cones. Their leaves are needle shaped or arranged as scales along the shoot and are usually dark green and hard to the touch. Pines, firs and spruces are all conifers.

Cross pollination: the transfer of pollen from the male part of one flower to the female part of another.

Deciduous: shedding leaves at the onset of winter. Most broadleaves are deciduous.

Disperse: to spread seed away from the parent tree.

Evergreen: keeping leaves throughout the year.

Evolution: the process of development from a simple to a more complex form.

Fungi: a mushroom, toadstool or one of the similar plants such as mould. They have no chlorophyll and obtain food from living or dead organic matter.

Germination: the beginnings of growth or the putting forth of shoots.

Glossary cont'd

Habitat: any place or type of place where an organism or community of organisms normally lives and thrives.

Ice Age: period when much of the northern hemisphere was covered with glaciers. The last ice age lasted roughly from 100,000BC to 15,000 BC.

Lichens: a combination of fungus and alga growing together.

Native forests: the term for the original natural forests of a region, even if they subsequently become semi-natural in their reliance on some form of human intervention

Parasite: an animal or plant that lives in or on another organism and gains nourishment from it.

Photosynthesis: the chemical process that occurs in the leaf by which water and carbon dioxide are combined to produce carbohydrates and oxygen.

Pollination: fertilisation by pollen. The transfer of pollen from the male organ where it is formed to the receptive region of the female organ.

Provenance: the place of origin of a species, subspecies or variety.

Re-colonisation: the reestablishment of vegetation on an area which has been stripped of plants.

Semi-natural Woods: woods that have a high degree of naturalness. Composed primarily or wholly of local native species of trees and shrubs that are derived from natural regeneration, coppicing or from mature plantations (19th Century or older). Often managed and nearly always influenced by human activities i.e. grazing, fragmentation and underplanting with non-natives. Most are relatively recent in origin or established by natural colonisation in the last few decades, whilst some are much older woodlands.

Suckers: new shoots produced from the base or underground roots of an established plant.

Understorey: any plants or shrubs growing under a tree canopy.

Viable: able to live and grow.

Grants for Native Woods

Afforestation grants are available from the Forest Service of the Department of the Marine and Natural resources. The precise rates are determined by the type of land and the species planted.
Grants are available under the Native Woodland Scheme, where the emphasis is placed on the conservation and biodiversity of native woodlands.
Under the NeighbourWood Scheme, funding is available to support the establishment or development, by local authorities, of woodlands in or near centres of population for the purpose of public enjoyment and recreation.
Grants are subject to certain conditions. For further information contact the Forest Service, Department of the Marine and Natural Resources, Johnstown Castle Estate, Co. Wexford.
Tel: 053 60200 LoCall:1890 200 223 Fax 053 43834/5/6
www.marine.gov.ie

SPECIES	TYPE	PREFERRED SITE	UNSUITABLE SITES	CONSERVATION VALUE	INSECTS SUPPORTED	COMMENTS
TREES						
Alder *Alnus glutinosa*	**E/F**	Prefers wet ground & stream banks. Will tolerate some winter flooding. Useful for very wet sites.	Does not like dry sandy ground.	Early flowering, good for insects. Seeds last long, good for tits, siskins & redpolls. Esp. good for red squirrels.	**90**	Enriches soil with nitrogen Fast growing but short lived. Coppices well. Good for stabilising river banks. Small to medium tree
Ash *Fraxinus excelsior*	**F**	Prefers well drained neutral to alkaline soils. Will withstand exposed sites/ windswept coastal areas.	Does not like waterlogged sites. Farmers don't like it planted beside cultivated land because of its shallow rooting system.	Gives only light shade so good for ground flora. Good for insects. Seeds good for birds, small mammals and red squirrels. Good for lichens.	**41**	Very common in hedgerows.
Birches *Betula pubescens* *Betula pendula*	**E/f**	Prefers light infertile soils. Downy birch does particularly well on wet, poorly drained peat. Silver birch, however, needs good drainage and a sunny position.	Does not do well in shade.	Casts light shade so good for ground flora. Seeds good for birds/red squirrels. very good for insects/fungi Good for dead wood	**229**	Does not transplant well. Therefore can be difficult to establish although in natural conditions is a pioneer species and can be invasive. Fast growing/short lived.
Cherry, Bird *Prunus padus*	**E**	Prefers damp fertile soils. Tolerant of more acid sandy soils.	Does not like exposed sites	Early flowering. Very good for insects. Fruit good for birds.		Found in mixed deciduous woodland.
Cherry Wild/Gean *Prunus avium*	**L/f**	Prefers fertile woodland soils but tolerates clay as well. Shallow rooting.	Dislikes wet sites.	Early flowering good for insects. Fruits excellent for birds (and seed collectors!)		Often found in old hedgerows Tolerates some shade. May be grown by lifting rooted suckers.
Crab apple *Malus pumila*	**L/f**	Prefers neutral to alkaline soils, but thrives in all fertile including heavy soils.		Early flowering good for insects. Fruits good for insects and birds.	**93**	Unlike modern hybrid apples, crab apples grow true from the apple pips.

SPECIES	TYPE	PREFERRED SITE	UNSUITABLE SITES	CONSERVATION VALUE	INSECTS SUPPORTED	COMMENTS
Elm, Wych *Ulmus glabra*	**F**	No particular preference but thrives in fertile free draining soils.	Does not like very dry sites.	Early flowers are very important for insects. Seeds important for red squirrels.	**82**	English elm is the most prone to Dutch Elm disease but it does affect wych elm.
Hazel *Corylus avellana*	**E/S**	Prefers heavier fertile soils. Will tolerate some shade. Ideal for hillsides and steep banks.	Does not like acid soils	Associated with a rich ground flora. Very good for insects, nuts eaten by many mammals and birds good lichen tree, esp. old stems.	**73**	An ideal understory species. Coppices well. Shade tolerant.
Holly *Ilex aquifolium*	**E/S**	A very hardy species. Tolerant of exposed sites and shade. Prefers neutral to acid peaty soils.	Does not like wet, poorly drained sites.	Berries important for thrushes. Foodplant of the holly blue butterfly. Good roost site for birds in winter.	**7**	Slow growing. Useful in hedges and screens. Shade tolerant. Coppices well. Can be difficult to establish. Only females produce berries.
Oak,Sessile *Quercus petraea*	**F**	Tolerates poorer, lighter, more acid soils than robur. More shade tolerant than robur, also more tolerant of frost.	Does not like badly drained infertile soils. Must have plenty of space.	Excellent for many forms of wildlife, insects, bird nesting cover, dead wood, fungi, lichens,	**284**	Excellent tree for wildlife. Often a major component of woodland plantings. Very wind firm. Very long living.
Oak, Pendunculate *Quercus robur*	**F**	Prefers clay soils and damp lowlands but generally tolerant.	as for *Q.petraea*	as for *Q.petraea* A high density of moth caterpillars.	**284**	as for *Q.petraea.*
Rowan *Sorbus aucuparia*	**E/S**	Grows in poor thin acid soils. Very hardy. Tolerant of exposed sites.	Does not like wet sites	Good insect tree. Important berry crop.	**28**	Can grow up to an altitude of 1000m. A good size for a small garden.
Scots Pine *Pinus sylvestris*	**F/E**	Prefers light sandy soils/also peaty acid soils. Does well on dry sites.	Does not like chalk/limestone soils or exposure to sea winds.	Good nesting tree. Cones excellent for red squirrels. Roost site for winter birds.	**91**	The best known and best loved of our native conifers.

SPECIES	TYPE	PREFERRED SITE	UNSUITABLE SITES	CONSERVATION VALUE	INSECTS SUPPORTED	COMMENTS
Strawberry Tree *Arbutus unedo*		Nutrient rich, well drained soil in sun or semi-shade.	Does not like cold, drying winds.	A rare species native in only three counties in Ireland and throughout the Mediterranean.		Each berry takes a full 12 months to mature. Therefore both blossom and berries are found at the same time.
Whitebeam, Irish *Sorbus hibernica*	**E**	Prefers alkaline soils but grows in a wide range of soils. Tolerates coastal exposure, rocky ground and fairly damp sites	Does not like very wet sites.	Good insect tree, important berry crop.		Best suited to hedgerows Tolerates shade.
Yew *Taxus baccata*	**E/F**	Prefers well drained alkaline soils. Tolerates shade.	Does not like very wet sites.	Berries good for birds.	**4**	Poisonous leaves, very slow growing.
SHRUBS						
Blackthorn/Sloe *Prunus spinosa*	**E/S**	Prefers open, sunny conditions. Tolerates a wide range of soils. Can grow in exposed and windswept coastal conditions.	Does not like very wet conditions.	Early flowering, very good for insects. Good nesting cover. Berries excellent for birds.	**109**	Dense and thorny, makes an ideal barrier against stock/ people. Spreads by suckers. Good for a hedge.
Broom *Cytisus scoparius*	**E**	Grows best on light, dry, acid soils.	Does not like wet conditions.	Good for insects. Foodplant of the green hairstreak butterfly.		Suitable for dry sunny banks.
Buckthorn, Purging *Rhammus catharticus*		Largely confined to calcareous soils.	Not tolerant of heavy shade under trees or of very dry sites.	Foodplant of the brimstone butterfly.	**27**	An uncommon shrub, often growing at lakesides on limestone soils.
Buckthorn, Alder *Frangula alnus*	**S**	A shrub of wet, though not water-logged, sites. Grows on peaty soils.		A very long flowering season. A long fruiting season from July to Nov. Foodplant of brimstone butterfly.		Once common, coppiced and the wood used for firewood.

SPECIES	TYPE	PREFERRED SITE	UNSUITABLE SITES	CONSERVATION VALUE	INSECTS SUPPORTED	COMMENTS
Dog-rose *Rosa canina*		Tolerates a wide range of soils but prefers calcareous to neutral soils. Can tolerate poor fertility.	Does not like wet soils or exposed sites.	Good for insects. Hips good for small birds and small mammals.	**c100**	Famous for its rose-hips Found in long-established hedges and thickets.
Elder *Sambucus nigra*	**E/S**	Prefers nutrient rich soils. Hardy. Useful for extremely chalky sites.		Good for insects and birds. An important berry crop.	**19**	A common shrub around the countryside. Associated with old refuse tips and middens where it appreciates the extra nutrients in the soil.
Gorse *Ulex europaeus*	**E**	Prefers dry and neutral soils.	Does not like poorly drained heavy clay soils. Does not like shallow chalky soils.	Good for insects. Provides excellent nesting cover. Food-plant of the green hairstreak butterfly.	**17**	Can grow in exposed sites. Withstands salty winds. Provides shelter in coastal areas.
Guelder Rose *Viburnum opulus*	**E/S**	Prefers alkaline fertile clay soils. Also likes neutral wet soils.	Does not like acid soils.	Good for insects, fruit good for birds.	**149**	Usually found in hedges or at the edge of fields and small woods beside a drain, also on inland loughs.
Hawthorn *Crataegus monogyna*	**E/f**	Tolerates a wide range of soils. Among hardiest and most adaptable trees, growing well in industrial areas/exposed sites.	Does not thrive in wet sites or very acid soils.	Excellent for wildlife. Early flowering good for insects. Fruits good for insects and birds. Good cover for nesting and roosting birds.	**20**	The commonest and best hedgerow species. Withstands cutting and hedge-laying.
Juniper *Juniperus communis*	**L**	Grows in rocky areas. Also on mountain heaths. Very tolerant of exposure.				
Spindle *Euonymus europaeus*	**E/S**	Prefers alkaline soils but tolerates a wide range of non-acid soils. Good on chalk but grows almost anywhere.		Good for insects.		Shares its most common areas of distribution with the guelder rose. Its wood was used for making spindles for spinning wheels.

SPECIES	TYPE	PREFERRED SITE	UNSUITABLE SITES	CONSERVATION VALUE	INSECTS SUPPORTED	COMMENTS
SPECIES FROM CUTTINGS						
Aspen *Populus tremula*	**E**	Suitable for damp clay soils. Tolerates wet conditions.	Does not like very dry sites.	Good for insects, foodplant of the hairstreak butterfly.	**97**	Fast growing. A pioneer species that can tolerate harsh conditions.
Bramble *Rubus fonticosa*	**C**	Tolerates a wide range of soils.		Excellent for insects, esp. late flowers & fruit for birds and mammals.		Excellent cover for nesting birds.
Honeysuckle *Lonicera periclymenum*	**C**	Prefers neutral to light acid soils.		Flowers excellent for big moths.		A common component of native decidous woodland Will grow from berries/ cuttings but best of all is to 'layer' it.
Ivy *Hedera helix*	**C**	Tolerates a wide range of soils.		Very good for insects as it is very late-flowering. Good nesting sites. Late berry crop important.		A good wildlife plant. There is a lot of debate as to whether it needs to be controlled in woodland. It is not a parasite of trees.
Willow, all	**E/f**	Prefer damp/wet soils.Ideal for streambanks.	Do not like dry sites or acid soils.	Excellent for many forms of wildlife, esp. insects & nesting birds. Early flowers important for bees.	**266**	Fast growing. Easily established from cuttings. Useful for stabilising river and stream banks.
Bayleaved willow *Salix pentandra*	**E**	Prefers heavy ground.	Does not like sandy sites.	see Willow, all.		
Creeping willow *Salix repens*		Prefers mountain & west coast sites.				

SPECIES	TYPE	PREFERRED SITE	UNSUITABLE SITES	CONSERVATION VALUE	INSECTS SUPPORTED	COMMENTS
Goat/Pussy willow *Salix caprea*	**E**	Tolerates a wide range of sites, even grows in dry places.	Do not like dry sites or acid soils.	see Willow, all.		Found in woodland and drier sites.
Grey willow *Salix cinerea*	**E**	Prefers damp/wet soils. Ideal for streambanks.	Does not like dry sites or acid soils.	see Willow, all.		Low dense structure makes it good for screening in wetter sites.
Purple Osier *Salix purpurea*	**E**	Prefers medium to wet sites.	Healthiest on limestone.			A low bush with fine twigs.
Osier *Salix viminalis*	**E**	Prefers damp/wet soils. Ideal for the water's edge.	Does not like dry sites or acid soils.	Nest sites for coots and grebes.		Grows well in shallow standing water.
Sally *Salix atrocinerea*	**E**	Mainly found in upland sites.	Does not like dry sites or acid soils.	see Willow,all.		
Eared willow *Salix aurita*	**E**	Prefers limestone or upland sites.	Does not like dry sites or acid soils.	see Willow,all.		A very small bush.

KEY **F** =high forest tree; **f** = minor forest tree
E =edge plants suitable for open woods, woodland edges or hedges
L =loners suitable for spot planting
S =plants for shrub layer under high forest trees
C=climbers, will tolerate shade

SPECIES	TIME OF FLOWERS	TIME OF SEED COLLECTION	INTERVAL BETWEEN GOOD SEED CROPS (YEARS)	SOW STRAIGHT AWAY	PREPARE/STRATIFY	PROPAGATE CUTTINGS/ LAYERING SUCKERS	COMMENTS
TREES							
ALDER *Alnus glutinosa*	**March**	September onwards	2-3	No	Sow in Spring. Store as directed in notes.		Pick when strobiles (sections of cone) are opening on the trees. from September onwards.
ASH *Fraxinus excelsior*	**April - May**	September onwards	3-5	Seed collected green in Aug. may be sown immediately, but germination the following spring erratic.	Spring sown seed must be pretreated for 10 months before sowing in March/April.		Spring sown seed will give more complete germination.
ASPEN *Populus tremula*	**March**	May/June	-	yes	Avoid	Best method 3" root cuttings.	Difficult from seed. Collect catkins when white down appears.
BIRCH, SILVER *Betula pendula*	**May**	September to December	1-3	yes	Store in a dry sealed container before sowing March/early April		Pick catkins shortly before they ripen and when they are still intact.
BIRCH, DOWNY *Betula pubescens*	**May**	August to November	1-3		or as Alder		as above
CHERRY, BIRD *Prunus padus*	**May-June**	August	1-3	Can be sown immediately but protect from mice.	Stratify for 6 months and sow in March/early April		Collect from the tree when the fruit is black, before the birds! It is best to clean the seeds of all pulp and juice as soon as possible.
CHERRY, WILD *Prunus avium*	**May**	Late July - August	1-3	as above	Stratifying can be delayed until October & sowing should be in Feb/Mar.		Collect before the birds! Seeds should be kept in an airtight container in a cool place between the time of extraction and sowing or stratification.
CRAB APPLE *Malus sylvestris*	**June**	October	2-4	Extract the seed from the fruit and sow immediately.	Best stratified. Extract the seed and stratify straight away. Sow in late February.		Seedlings vulnerable to frost because they germinate early.

SPECIES	TIME OF FLOWERS	TIME OF SEED COLLECTION	INTERVAL BETWEEN GOOD SEED CROPS (YEARS)	SOW STRAIGHT AWAY	PREPARE/STRATIFY	PROPAGATE CUTTINGS/ LAYERING SUCKERS	COMMENTS
ELM, WYCH *Ulmus glabra*	**March/April**	June	1-2	Sow immediately after collection, the same day if possible.	Avoid storage.	Possible by suckers and some cuttings do strike.	Pick before natural dispersion (when green pigment disappears from wing.) Sow same day.
HAWTHORN *Cratageus monogyna*	**May - June**				Two winters ie. 18mths.		
HAZEL *Corylus avellana*	**February - March**	October	2-3	Can be sown in autumn but vulnerable to being eaten by mice/birds.	Best to stratify for 6 months and sow in early April.		Some recommend soaking in water for 2 days before autumn sowing. Best if it has been stored.
HOLLY *Ilex aquilifolia*	**May - June**	December/July	2-4		Stratify in sand for 16 months perhaps even a third winter.	Cuttings/ layering	Pick fully ripe berries. Lift plants when roots are actively growing. May be propagated by rooting in heated frames.
OAK, SESSILE *Quercus petraea*	**May**	October	2-5	May be sown in autumn if soil well drained and seeds are protected from predation. Cover with 3-4" extra soil and remove in March.	Alternatively spring sow. Storage not easy. Moulds if damp, dies if dry. Store at -2° /-3° C.		Pick from the ground after the first frost. Laying down taurpaulins can be helpful.
OAK, PENDUNCULATE *Quercus robur*	**May**	October	3-5	as above	as above		as above
ROWAN *Sorbus aucuparia*	**May**	Early September	2-3		Macerate berries and separate seed from fruit. Stratify for one winter if extracted, for two winters if not extracted.		Pick fully ripe berries. If seed not separated from fruit it may remain dormant for an additional year.
YEW *Taxus baccata*	**February**	October -November			2-3 winters	Mist Propagator for cuttings.	The seed (not the flesh) and the foliage are poisonous.
WHITEBEAM *Sorbus aria*	**June**	September-October	2-3		Yes, for one winter sometimes two. Check 1st Feb - March.		Pick fully ripe berries.

SPECIES	TIME OF FLOWERS	TIME OF SEED COLLECTION	INTERVAL BETWEEN GOOD SEED CROPS (YEARS)	SOW STRAIGHT AWAY	PREPARE/STRATIFY	PROPAGATE CUTTINGS/ LAYERING SUCKERS	COMMENTS
SCOT'S PINE *Pinus sylvestris*	May-June	September/ October		Seed can be stored short term, in a fridge at 2° C in a sealed polythene bag.			Only collect cones from forests if you are sure they are Scots pine.
STAWBERRY TREE *Arbutus unedo*	September-December	September/ October		Yes	Extract seed from pulp of fruit before sowing.		Seedlings must be kept moist and shaded. Susceptible to frost.
SHRUB SPECIES							
BRAMBLE *Rubus fonticosa*	From June on	September			For one winter.	Yes	
BLACKTHORN *Prunus spinosa*	February - March	November	1-2		Yes, for two winters if not extracted.		Pick when fruit blue black. It is desirable to clean the seeds of all pulp & juice after collection.
BROOM *Cystis scoparius*	May - June	August onwards	1	Can be sown straight away. Scarify at sowing.	Alternatively store in a dry airtight container over winter and sow end of March /early April.		Pick pods when black. The seeds have a very hard seed coat - breach it by scarifying or try pouring boiling water over them.
BUCKTHORN *Rhamnus catharticus*	June	October			Spring sow after treatment Extract and stratify immediately.		Pick two weeks before fully ripe.
ALDER BUCKTHORN *Frangula alnus*	May - Sept.	July - November			As above.		
DOG ROSE *Rosa canina*	June	September - December			Spring sow after treatment. Often stays dormant for 18mths.		Collect when fruits turn red.
ELDER *Sambucus nigra*	June	September - October	1		Spring sow after treatment.		The berries may be soaked and macerated or fermented to remove the flesh and release the tiny seeds.

SPECIES	TIME OF FLOWERS	TIME OF SEED COLLECTION	INTERVAL BETWEEN GOOD SEED CROPS (YEARS)	SOW STRAIGHT AWAY	PREPARE/STRATIFY	PROPAGATE CUTTINGS/ LAYERING SUCKERS	COMMENTS
GORSE *Ulex europaeus*	**January on**	From May on		Can be sown straight away. Scarify at sowing.	Store dry in a dry air-tight container over winter.		Pick the pods before they burst.
GUELDER ROSE *Viburnum opulus*		September October	1		Extract and stratify.		Collect when fruits are red and soft.
HAWTHORN *Cratageus monogyna*	**May - June**	October	1-2		Stratify for 9-10 months. Best extract seed first but berries can be stratified whole.		Pick fully ripe berries. Stratify over two full winters.
HONEYSUCKLE *Lonicera periclymenum*	**June**	October			Yes, over one winter.	From cuttings or by layering.	
IVY *Hedera helix*	**December**	July - August		Yes	Or stratify to the next spring.	From cuttings.	
JUNIPER *Juniperus communis*		Winter			Stratify to 2nd spring.	Best grown from cuttings.	
SPINDLE *Euonymus europaeus*	**June**	October/November	2-4		Extract and stratify over one winter.	Easily grown from cuttings.	Fruits are colourful.
WILLOW *Salix. spp*	**February/ March**	May - June	1	Yes		Best grown from cuttings	