



Treading softly on the earth ...with Paddy Madden

EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD)

In the previous issue of *In Touch* I wrote about creating compost in the school grounds using a New Zealand Bin and a hot bin. This can be added to raised beds to increase soil biodiversity. The more biodiverse the soil is the more it breaks down organic matter, adds to sound soil structure and provides essential plant nutrients. Healthy and enriched soil sequesters carbon and thus mitigates climate change. In this issue I will be concentrating on the growing of trees and the creation of leaf mould to mitigate climate change and increase biodiversity above and below ground.

Did you know?

In 2006, scientists suggested that 25% of the planet's biodiversity resided in soil. In a recent study in the *Journal, Proceedings of the Natural Academy of Sciences*, that figure has been upgraded to 59% making it the most biodiverse habitat on earth.

Why plant trees on the school grounds?

Trees absorb atmospheric carbon (CO₂) through their leaves in the process



known as photosynthesis. They store it in their trunks, branches and root systems. CO₂, a gas that retains heat, is the greenhouse gas responsible for most of the global warming that occurs. When the leaves fall, they are decomposed by microorganisms and earthworms. This process of decomposition returns nutrients to the soil. This enriched soil is a carbon sink.

When and where should they be planted?

The optimum time to plant trees is in any month with an "r" in it except April and September when the soil is too warm. The cheapest option is to use saplings which are very young trees. When planted they do not need staking. In

November and March, it is relatively easy to acquire bare-rooted native whips (0.5-1m all young trees) from bodies such as The Tree Council of Ireland, Easy Treesie, Trees on the Land and local authorities. Select a neglected corner of the school grounds for establishing a mini wood. Make sure there are no overhead cables. Check the eventual heights of the trees and make sure that the trees are these distances from the nearest buildings. It is a good idea to include some native woodland shrubs such as hazel and holly in the planting mix. These will create a shrub layer in the wood adding to its biodiversity value.

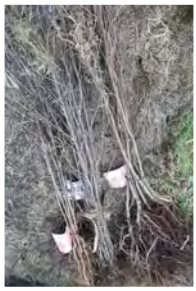
Native trees

Suitable native trees include oak (*quercus robur* and *petraea*), birch (*betula pendula* and *betula pubescens*), ash (*fraxinus excelsior*), Alder (*alnus glutinosa*), Rowan (*sorbus aucuparia*). Suitable shrubs include holly (*ilex aquifolium*), hawthorn (*crataegus monogyna*), hazel (*corylus avellana*), crab apple (*malus sylvestris*). A comprehensive list of native trees and



shrubs can be accessed here: cdn.ringofgullion.org/2015/09/OurTrees.pdf and www.treecouncil.ie/native-irish-trees

Preparation of the ground



When the whips arrive, they will be contained in bags that are tightly bound with twine. Keep them in the bags until they are ready for use because if they're exposed to air for a short period of time the roots will dry out.

Dig up tough perennial weeds such as nettles, docks, dandelions, thistle and scutch first. If the trees are going to be planted in March cover the area with thick layers of cardboard for at least six months. This process will create a clean, weed-free area for the planting.

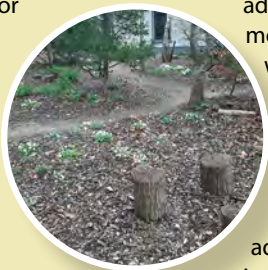
Planting

1. Make T-slits, two metres apart in the ground to be planted. For each whip lift the flaps of one T-slit sod and insert the whip. Fold back the flaps and firm the area with the foot. Continue planting leaving two metres between each whip.



2. Place thick layers of soaking wet newspapers to the extent of one metre square around each whip. This action will discourage encroaching weeds and encourage worm activity to aerate the soil around each whip. Cover the newspapers with at least 10cm of bark mulch.

3. When planting the whips ensure that there is space for a winding path at least 1 metre wide through the area. See: bit.ly/howtoplanttrees



Aftercare

There is very little maintenance if the above steps are carried out. When dappled shade develops after a couple of years plant native bluebells, primroses, wood anemones and ferns to create a field layer in the wood.



Creating leaf mould

from autumn leaves

The process of autumn leaves turning into leaf mould involves a myriad of fungi, millipedes, centipedes and earthworms breaking down the tough substances that make up leaves. Leaf mould, whether added to soil as a soil enricher or used as a mulch to cover soil will increase greatly the population of soil invertebrates and beneficial microbes.

What exactly is it?

Leaf mould is a dark, crumbly substance made from decaying leaves. It is much easier to create than compost. Leaf mould has fewer nutrients in it than compost but nonetheless it acts as a valuable soil conditioner and mulching material and can be used to create seed compost and potting compost.

Is it good for soil biodiversity?

Yes. It increases worm and microorganism activity in the soil because it is digested by these creatures. The more active the worms and microorganisms, the more soil becomes enriched with nutrients. The more enriched the soil, the more carbon it sequesters. The more degraded the soil, the more carbon it releases.

Are all leaves equally good for making leaf mould?

No. The ones that break down easily are deciduous ones like ash, beech, silver birch, cherry, hornbeam, oak and willow. Sycamore, horse chestnut, hawthorn and maple take longer. It is a good idea to shred these using a lawnmower before adding to the leaf mould heap. Leaves with a waxy coating such as holly, laurel and rhododendron should be shredded and added as a brown ingredient to the compost heap.



What kind of containers are used for the gathered leaves?

1. The damp leaves can be stored in strong hessian bags. These have plenty of air holes to allow fungi in to break down the leaves. See: bit.ly/hessianbags.
2. They can also be stored in cage-like



containers about a foot square made from four posts and galvanised wire mesh.

3. Because it takes two years for fungi to break down the leaves, two mesh containers will be required. The first one is left alone for two years once it's filled; the second one is filled the year after the first one started.

How does the process work?

The decomposition of the leaves is caused by the slow activity of a myriad of fungi.

How long does it take?

It takes two years to make good leaf mould that can be added to soil as a conditioner. After one year, however, the partially decomposed leaves can be added to beds as a mulch to suppress weeds and prevent leaching of nutrients from the soil.

Where should the containers be sited?

They should be sited in the shadiest part of the garden because the fungi work best out of direct sunlight.

Health and safety

The disturbance of damp, wet leaves can release harmful moulds so children or adults with asthma or mould allergies should avoid them.

Fócloir

Leaf mould: *Múirín duillí*
Global warming: *Téamh domhanda*
Nutrients: *Cothaitheach*
Deciduous: *Duillsilteach*
Evergreen: *Síorghlas*
Mulch: *Mota*
Decompose: *lobh*

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