INTRODUCTION

CALU partner Coed Cymru has been collecting alternative tree and shrub species for use in shelterbelts. They were looking for species and cultivars which have desirable characteristics, such as dense low level shelter, diffuse taller growth but also produce useful by-products like fruit, nuts and timber.

They looked at a wide range of temperate species and also visited the Agroforestry Research Trust in Totnes, Devon. In an area similar to lowland Wales this collection has been established for 12 years. Shelterbelts of various species and mixtures were planted 12 years ago to protect the orchards.

Fig 1: Plum upper layer with dogwood and English elm below, near Usk,

DESIRABLE CHARACTERISTICS

The basic principles involve creating a shelterbelt that reduces windflow to around 50%. Too dense a shelter creates turbulence and the possibility of inadvertently increasing windspeed in the area you are trying to protect. Ideally there will be two or more rows of **high level porous shelter** with a **denser row of low level** shrubs. The sheltered area is roughly 10 to 20 times the height of the trees.

LOW LEVEL COVER FOR EARLY SEASON PROTECTION OF LAMBS, CALVES, CROPS ETC

Ideally species for early season protection should be dense, evergreen or early flushing and shade tolerant. Hawthorn, hazel, blackthorn and most of the common natives are late flushing, after lambs are past the vulnerable period. Holly is good but difficult to propagate and painfully slow to establish. Alternatives include the **gooseberry family** (native and North American 'Worcesterberry') and red currant, **barberry** (native and Asiatic), **autumn olive** (Eleagnus spp, one evergreen), and **Japanese wineberry**. All are well established in this country and we are not aware of any problems of uncontrolled spread. All of the gooseberry and currants share fungal pathogens with pine, so they need to be kept apart. On coastal sites **sea buckthorn** is useful, but it does have wandering habits if not delimited by fencing and grazing. All of these plants provide edible fruit. The wineberries and gooseberries are the most palatable.

Fig 2: A hybrid willow upper layer with dense Japanese wineberry below at the Agroforestry Research Trust

HIGHER LEVEL DIFFUSE GROWTH

This should provide a filter rather than a barrier to the wind to prevent eddying and downdrafts. Species like **birch**, **alder** and **aspen** are very good. Pine can be good while it is young. There are a number of **plum varieties**, **sweet chestnut**, **walnut** (European, Japanese and American) that are suitable and also **holm oak** in coastal areas. Any attempt to grow walnut will require rigorous and sustained squirrel trapping. **Osage orange** is widely grown as hedging and shelterbelts in the USA but the plants are very hard to find in the UK. Some varieties of willow may be appropriate but they have a habit of disrupting drains if sited incorrectly.

DEMONSTRATION SITES

Four sites have been established by Coed Cymru (funded by CALU): two in the uplands and two coastal. Monitoring will continue and further work will be published on the Coed Cymru and CALU websites.

FURTHER INFORMATION

The Forestry Commission publish a useful guide 'The Principles of Using Woods for Shelter' (April 2006). See: http://www.forestry.gov.uk/publications to download it.

Visit Coed Cymru's website for information on all woodland matters – www.coedcymru.org.uk

RECOMMENDED SPECIES AND VARIETIES:

Higher level growth:

Birch (downy or silver)
Alder (common native)
Aspen native species.
Plums, cherry plum and damsons. Choose hardy plants on vigorous rootstocks.
Sweet chestnut, '*Marigoule*' hybrid is recommended for cold tolerance and crops of nuts. All sweet chestnuts produce useful timber.
Walnut. Hardy varieties are best. Black Walnut (*Juglans nigra*) is recommended as are some Japanese varieties.
Holm Oak (*Quercus ilex*) is salt tolerant but sensitive to severe frost.
Willows require careful selection to be windfirm and disease resistant and careful siting to avoid damage caused by roots.

Lower level cover:

Barberry: *Berberis darwinii* or *asiatica* are recommended.
Elaeagnus: *angustifolia* ('Russian Olive') is deciduous and *ebbingei* hybrid is evergreen and shade tolerant.
Sea Buckthorn (*Hippophae ramnoides)* produces orange fruits and salt tolerant.
Japanese Wineberry (*Rubus phoenicolasius)* produces lots of raspberry like fruits with good taste and provides low level shelter.
Worcesterberry: vigorous prickly gooseberry relative with similar fruits that are red. It is both sun and shade tolerant and comes into leaf much earlier than hawthorn.

Red currant, blackcurrant, alpine currant, mulberry, hazel nuts and elder also have merit.

SUPPLIERS

Agroforestry Research Trust Totnes, Devon:	www.agroforestry.co.uk
Deacons Nursery, Isle of Wight:	www.deaconsnurseryfruits.co.uk
Kore Wild Fruit Nursery, Monmouth:	www.korewildfruitnursery.co.uk
Dingle Nursery, Welshpool:	www.dinglenurseries.co.uk
Manse Organics, Llandeilo:	www.graftedwalnuts.co.uk
Musgrove Willows, Somerset:	www.musgrovewillows.co.uk