There are a number of these birch planted on campus, although the majority now appear to be in the Betula border on the north side of Ellesmere Junction opposite the north end of Hudson. The paper-bark birch trees have been planted alternately with silver birch trees. The paper-bark birch has larger leaves than silver birch and bark that can be peeled off in horizontal strips (although it should not be as this clearly damages the tree). Silver birch trunks have more chunky bark deeply fissured and marked with black diamond shapes as they get older. *Betula* spp. are monoecious, medium to large, fast growing deciduous trees.
*Betula pendula* ‘Dalecarlica’ (Swedish birch, cut leafed birch)

This tree is an elegant form of the common silver birch (west Library). It has weeping branch tips, dissected leaves and a narrow, upright form. There are many other *Betula* species on campus, the most common being the silver birch, apparently promoted by the Landscape Architects at Lincoln in the 1960’s for group planting in three’s. A group of three silver birch still exist in front of Memorial Hall. The Betula Border (north side of Ellesmere Junction Road opposite Lincoln University) was named for the large numbers of silver birch and paper bark birches planted around 1960. *Betula* are medium sized deciduous trees with attractive bark and good autumn foliage. Separate male and female catkins are produced in spring and according to Professor Spellerburg, silver birch are responsible for pollen allergies suffered by some of the general population. He has also made representations to various councils around New Zealand to have silver birch trees removed from all public places. There are many other *Betula* on campus such as the weeping form *Betula pendula* ‘Youngii’ (midway Betula Border) and *Betula ermanii* with superb trunk markings (north side McCaskill building) and *Betula utilis* in the Amenity area. There is a collection of *Betula* species (southern end of Orchard carpark planted 1990’s).
Betula ermanii - north of the recently demolished McCaskill building

Betula utilis - west of the pond in the Amenity area
Betula pendula, Betula pendula ‘Youngii’ and Betula pendula ‘Purpurea’ and possibly others under planted with Hedera canariensis. This was a planting designed by Michael Cole a landscape architect in the then Department of Horticulture, Landscape and Parks around about 1980.

The Grounds feel this is easy to maintain and the trees allow light into the lower offices in the winter

The scale of the trees is appropriate in relation to the size of the building here.
*Broussonetia papyrifera* (aute or paper mulberry)

Paper mulberry is a small deciduous tree that suckers prolifically and spreads as a consequence. The species originates from Japan and China. This tree is of interest as it was first introduced to New Zealand by the Maori and was identified by Banks and Solander from six plants growing in the Bay of Islands, New Zealand, on Cook’s first voyage in 1769. Paper mulberry was apparently used as a source of tapa cloth in Samoa, Tonga and other parts of Polynesia. By 1880 it was reported by Colenso that no aute was now growing anywhere in New Zealand. It appears as though the plants’ hardiness capabilities were lost as plants were transported from island to island throughout the Pacific over a great many years. The tree that this species is from was introduced into New Zealand by the DSIR at Lincoln, the seed coming from China. This selection of paper mulberry appears perfectly hardy at Lincoln University, leaves colour up to yellow shades in the autumn before falling. The leaves are large, alternate and hairy, the tree does not appear to grow more than five or so metres in height in cultivation. The success of the Lincoln plants emphasizes the values of selecting the right provenance (in this case cold tolerant material) suitable for New Zealand conditions.

Aute or paper mulberry (*Broussonetia papyrifera*) is the deciduous tree on the left above growing on the extreme east of the New Zealand native plants collection.
*Calliandra portoricensis*  (snow flake wattle)

This is a small evergreen tree or shrub on the eastern side of the entranceway into the library. It is a legume belonging to the Mimosoideae. The snowflake wattle is one of about 200 species of *Calliandra*, most are shrubs or small trees of tropical and subtropical regions. *Calliandra portoricensis* is a native of Southern Mexico to Panama and the West Indies. The snowflake wattle is not particularly common in Canterbury, it grows well in this site because it is against a warm north facing wall that traps heat during the day and reradiates it at night. Similarly a number of other plants along this wall have been selected because of this microclimate. Most are also suited to drier soils. The snowflake wattle has alternately arranged, bipinnately compound leaves with 2-7 pair of pinnae and numerous linear pinnules arranged opposite each other on rachides. The stems, petioles and rachis are covered in fine hairs. Flowers are produced in globose heads on long peduncles from the leaf axils in summer. The flowers are white and mainly showy because of the mass of long stamens that hide the tiny petals and sepals within. There was a much smaller *Calliandra tweedii* growing on the other side of the main entrance, this had bright scarlet flowers, but this was removed many years ago.

upright habit of the snow flake wattle, east of the main entrance to the Library

pinnately complound leaves and the showy stamens of the flowering inflorescences.
*Callitris oblonga*  (Tasmanian cypress pine)

There were two examples of this species, the oldest one on Farm Road outside the old grounds office (Now part of the cricket grounds staff). This tree was cut out for some reason in 2002. The second example was planted amongst the collection of Cupressaceae in the Amenity area in August 1995. This tree was a donation from Max Visch, a member of the Friends of the Christchurch Botanic Gardens. This evergreen species is a native of Tasmania and has tiny scale like leaves and valvate shaped cones. It does not appear to grow particularly fast.
Calocedrus decurrens  (incense cedar)

There are two examples of this species on campus. The older of the two is opposite the eastern end of Farm Road. This tree has been disfigured too keep it clear of lines. I estimate it to be around fifty years old. The other tree was planted in May 1990 in the Amenity area amongst the Cupressaceae family collection.
Carpinus betulus  (hornbeam, European hornbeam, common hornbeam)

Hornbeam is a medium sized deciduous tree with a broad crown at maturity that can be variable from broad conic to pyramidal particularly when younger. It has a moderate growth rate, numerous ascending branches and a densely branched crown. *Carpinus betulus* is a native of Europe and Asia Minor, it is sometimes used for hedging, tolerating clipping well, but is more likely used as a specimen tree. There is a formal hedge of this species between Hilgendorf and Burns wing. Hornbeams have alternately arranged simple leaves up to about 10cm long and 3 to 4cm wide, with a petiole of about 1cm. The leaves are sharply toothed at each vein end and have minor serrations between. The leaves have very clear primary pinnate venation above and below and are glabrous, except when leaves are very young. The leaves are darker above. Hornbeams are monoecious with separate male and female catkins produced in the spring. Seeds are produced and hang in clusters of green bracts seen in mid spring that ripen to yellowish brown over the summer. The leaves colour up to shades of brown before falling in the autumn.
Carpodetus serratus  (putaputaweta, marble leaf)

This is a small endemic evergreen New Zealand native tree. It is found growing naturally throughout much of New Zealand in lowland and montane forests. The leaves are simple and alternately arranged on the stems, they vary in size between adult and juvenile forms. The juvenile form has slender divaricating branches and broad ovate to orbicular leaves 1-3cm long and to 2cm across with 10mm petioles. Adult leaves are 5 - 9cm long and 4cm or so wide with petioles up to 10mm. The lamina is ovate to broadly elliptic with coarsely serrate margins. The lamina has a distinctly marbled appearance, mostly glabrous except for the midrib. Flowers appear during the summer, they are small (about 5mm), white and clustered in panicles about 5cm across. The ripe fruit is a small black capsule. There are a few examples of this species on campus, possibly the largest is in the Amenity area at the western end of Farm Road, on the western side of the pond. This was planted in 1990, a second example is to the south of the Library, planted in 1994.
Casuarina cunninghamiana  (river she–oak, she-oak)

The she-oak is a relatively fast growing tree with a somewhat rounded form, the main branches ascend quite strongly, in many respects it has the general appearance of a pine tree. It is not a conifer however, but is a flowering, evergreen tree species native to the eastern parts of Australia. The she-oak has tiny, triangular scale like leaves arranged in whorls of seven to nine around the thin green stems at each node. Superficially the stems are often mistaken for pine needles or similar by students until the arrangement is studied more closely. The tree produces clusters of small crimson male flowers, usually between July and September, and clusters of female flowers subtended by woody bracts. The fruit that forms are samaras of individual flowers with enlarged woody bracteoles that appear like a small woody cone, erroneously reinforcing to the uninitiated that this is some sort of conifer. The flowers need to be looked at closely on the branches or are likely to be missed, despite the crimson colour. The she-oak is a useful shelter tree, it is hardy at Lincoln and is commonly used for horticultural shelter belts in parts of the North Island. It is quite hardy in coastal areas as well. It is a good tree for testing students’ knowledge of Angiosperms and Gymnosperms.
**Catalpa bignonioides** (Indian bean tree)

This tree originates from S.E. USA and is seen midway on the eastern side of the Stewart Building. It is a deciduous tree and has a broad dome shaped spreading form, appears wider than high and after flowering in the late summer produces long bean like pendulous capsules of up to 40cm in length. This tree was shifted about the same time as the tupelo (*Nyssa sylvatica*) from south of the Lodge when the Commerce Building was built. Since shifting, this tree has grown extremely well in this site where it is sheltered from most winds. Other specimens of this tree can be found, such as the one near the carpark to the west of Forbes Building. (On second look this tree may be a yellow leaved cultivar ‘Aurea’). There is another example on the eastern side of Forbes which is crowded amongst other trees and not a particularly good specimen either. The Indian bean tree produces large soft leaves and others with similar leaves such as the Imperial tree of China (*Paulownia tomentosa*) only do well at Lincoln and other parts of Canterbury with good wind shelter. The leaves are very soft and hairy when young, often a bronze – purple colour at first, the hair disappears except for some below as the leaves age and become green. The alternately arranged, broadly ovate leaves can be 25cm by 20cm and the flowers produced in mid summer are arranged in broad panicles, similar in some respects to those of horse chestnuts. Flowers are white with yellow and purple.
Catalpa bignonioides ‘Aurea’  (Indian bean tree)

This tree is on the south side of the western car park of Forbes.

yellow leaves, otherwise same as for species
*Cedrus deodara* (deodar cedar, Himalayan cedar)

*Cedrus deodara* is a large conical evergreen conifer from the Western Himalayas and Afghanistan. It is a good hardy tree tolerant of the vagaries of the Canterbury climate, surviving where many other species have succumbed in drought or snow. It has a reasonable rate of growth and is widely used as a shelter tree and is suitable for parks or large gardens. The deodar cedar is easily recognised by its pyramidal to conical form and its pendulous branch tips. Deodar cedars have needle-like leaves borne singly in long (young) shoots spiralling around the axis, on short (older) shoots the needles are compressed into clumps of around twenty. Needles are a grey-green colour and about 4cm long. Deodar cedars are monoecious, separate male and female cones develop at the tips of the short shoots on the same plant. Male cones are seen in autumn, about 8-9cm in length, purple and later yellowish. Female cones are barrel shaped at maturity before shedding seed and scales. Often only the remains of the cone only may be seen as a few scales and a central axis. Female cones are around 10-12cm at maturity.
Sir Joseph Hooker and other authorities regarded Cedrus as one species with distinct geographical forms. More recently Schwartz recognizes two species only C. deodara and C. libanii, the latter containing two subspecies brevifolia and atlantica. Previously four species have been recognised suggesting some uncertainty about the taxonomy of this genus. This hardy, large evergreen conifer occupies one of the prime spots in the central campus being situated near the flagpole, between the Library and Forbes Building. It is probably between 80 and 100 years old. It is widely known as the Cedar of Lebanon and is distinguished from other cedars at maturity by its vertical limbs with more or less levels branches particularly toward the upper reaches of the crown. (The length of the needles up to 40mm, the young staminate catkins are purple and slightly weeping branch tips suggest it could be Cedrus deodara? or possibly of hybrid origin). Younger examples of Himalayan cedar (Cedrus deodara) and the Atlantic or Atlas mountain cedar (Cedrus libani ssp. atlantica), are more commonly seen around Lincoln and Canterbury generally as shelter trees, selected blue seedlings of the Atlantic cedar are often grown as specimen trees. A good example of this species is at the southern end of Hudson on the eastern side. In the younger state cedars are pyramidal, the deodar cedar is easily recognised by its weeping tips and longer needles, whilst the atlantic cedar has shorter needles with the tips of the branches ascending. The deodar cedar typically has about half the number of needles in a short shoot of that of the atlantic cedar.
Cedrus libani subsp. atlantica (blue atlantic cedar)

at the south west end of Burns Wing. This tree had large round river stones placed against the trunk when levels around the tree were lifted in order that the tree trunk can still respire. The same did not happen for the Irish yew on the path to the new Stewart Building and that tree slowly died due to raised soil levels over the roots and around the trunk.

Male and larger barrel shaped female cones, needles in long and short shoots. The scales fall from the female cones when ripe releasing seed and leaves the remains of the central axis of the cone often seen on cedars.
Cephalotaxus harringtonia var. drupacea  (Japanese plum yew)

This tree was from a seed from the Christchurch Botanic Gardens grown by myself and planted out in the Amenity Area in May 1991. It is the only genus belonging to the Cephalotaxaceae. This is a small slow growing tree, not expected to grow more than about 5 metres in height in cultivation and is a native of Japan, central and western China. This species is dioecious. The leaves are more or less arranged in an upward pointing v shape, they are about 25-30mm long by about 3-4mm across. The leaves have a sharply pointed apex and a short stalk, they are glossy green above with a raised midrib. They have numerous lines of stomata either side of the midrib below presenting a duller grey colour. Male strobili are a pale brown colour found in the axils of the leaves on the underside of the v formation. Female cones are drupe like, stalked, about 25mm or so (hence plum yew - based on the plum like appearance of the cones and the yew with leaves like those in the genus Taxus.)
Cercis siliquastrum (Judas tree)
The Judas tree is a small to medium sized deciduous tree of usually less than six metres or so in height and spread, old trees may be more. It flowers at Lincoln from late September to early November. It has small cerise pink flowers that are pea shaped and in clusters of up to 6 or so flowers on single or paired racemes in the axils on previous seasons and older wood. In the early stages the flowers are seen on more or less bare branches with the leaves gradually flushing as flowering is part way through. The flowers are strongly zygomorphic, about 18mm long on pedicels of up to 24mm, stamens are free. The ovary develops into a pod, pods are 5-10cm by about 2cm deep and flattened or compressed, containing about 12 flattish seeds. Old pods are often seen on the tree right through winter. The leaves are alternately arranged, round to kidney shaped with an entire margin and cordate base and often with an obcordate or obtuse apex. The lamina is up to 8cm long by 10cm across on a petiole of about 3cm. The petioles and young stems are a red colour, as are some of the palmately arranged veins visible above and below. The leaf is a dull green above and slightly paler below. All parts of the leaf and young twigs are glabrous. An example of this tree can be seen on the western side of the Field Service Centre buildings toward the southern end. Others are west of Colombo Halls, Amenity area, Orchard carpark and the Betula border.