



## ESTIMATING THE AGE OF A TREE FROM ITS GIRTH

As a general rule a tree will be a veteran if it has a girth (measured at 1.5m from the highest point of the surrounding ground) of at least 3m, but this does vary with species:

Birch species, Hawthorn.	2m
Field maple, Rowan, Grey and Goat Willow, Hornbeam, Holly, Cherry, Alder.	2.5m
Oak species, Ash Scot's Pine, Yew, Elm species.	3m
Lime species, Sycamore, Horse Chestnut, Poplar species, other Pine species, Beech, Sweet Chestnut, White and Crack Willows.	4.5m

The mean increase in girth of mature trees with a full crown and growing in good condition is 2.5cm (or one inch) per year. This applies to most species of large trees, whether coniferous or broad-leaved. Trees grow faster when they are young and slower when old, but averaged over many years the increase in girth is about one inch per year. Obviously with very old trees this will be an underestimate. There are species that grow much faster, and a few that grow much slower; but in general it is the growing conditions, rather than the species, that determines the rate of growth. Thus a tree of girth 3m is usually 100 years old if it is growing in good conditions, but 200 years old if growing in a wood, and 150 years old if slightly crowded, as in an avenue.

For **Oaks** growing in good conditions the growth rate is 3.8-5cm per year for their first 60-80 years, and then 2.5cm per year until they have a girth of 6.5m. Thereafter growth slows, the decrease depending on the loss of leafing crown. They seldom survive with a growth rate of less than 2.5cm in 5-6 years.

### Major exceptions:

Normal growth of 5cm - 7.6cm (2"-3") per year:

Wellingtonia (rarely to 15cm), Coastal Redwood, Low's Fir, Grand Fir, Cedar of Lebanon, Monterey Cypress, Sitka Spruce, Douglas Fir, Western Red Cedar, Western Hemlock, Cricket-bat Willow, Black Italian and other hybrid poplars, Wingnuts, *Nothofagus* spp, Red and Chestnut-leafed Oaks, Hungarian and Turkey Oaks, Tulip-tree, London Plane, and most *Eucalyptus* spp

Normal growth considerable less than 2.5cm (1") per year:

Scots pine, Norway Spruce, Horse Chestnut, Common Lime, Yew and most small-growing trees.

**Yew** has a unique growth pattern. They follow the standard 2.5cm per year for the first 100 years, but then it falls to about 1.3cm per year. Gradually, over 400-500 years it falls to 2.5cm in 5-15 years, whilst the crown is still in full vigour and increasing its spread annually; but they can return to formative rates of growth at almost any stage. Hence it is difficult to estimate their age from their girth. As a rough guide:

2.5m = 100-150 yrs; 5m = 300-400 yrs; 6m = 500-600 yrs; 9m = 850-1000 yrs.

The following tables show more detailed calculations of the ages of certain species. An extended version is on the WDVTA Yahoo site. Additional species included in that version are: Austrian Pine, Beech, Black Mulberry, Cedar of Lebanon, Monkey Puzzle, Robinia, Tulip Tree, Turkey Oak and Walnut. [Most large trees' calculated from Mitchell's generalisation described above. Specific species calculated from White's epidemiologically derived formulae. Although the age-girth relationship is not linear, a linear approximation exists over half-metre ranges and so it is valid to extrapolate (within half-metre ranges) on a *pro-rata* basis. Eg: approximate age of an oak, growing in average conditions, with a girth of 2.75m is  $(115+143)/2 = 129$  yrs.]

### References:

- Mitchell, Alan (1974) "A Field Guide to the Trees of Britain and Northern Europe" pub Collins ISBN 0 00 212035 6  
 Rural Development Service (2006) "Environmental Stewardship: Farm Environment Plan Guidance 009"  
 White, John (1998) "Estimating the Age of Large and Veteran Trees in Britain" Information Note 12 pub Forestry Commission129

## Estimates of age for certain tree species with girth 2.5m - 5.0m

		Girth (m)	2.5	3.0	3.5	4.0	4.5	5.0
		Estimated age (years)						
<b>Most large trees</b>	Growing in good conditions		98	118	138	157	177	197
broad-leaved & coniferous	Growing in an avenue		153	184	215	245	276	307
	Growing in a wood		205	246	287	328	369	410
<b>Coppiced trees</b>	Oak, Lime, Ash, Hazel		270	320	370	430	480	530
	Field Maple		220	270	310	360	400	450
	Sweet chestnut, Sycamore		110	130	160	180	200	220
<b>English and Sessile Oak</b>	Champion tree potential (ideal site conditions)		80	100	124	151	182	217
<i>Quercus robur</i>	Good site, open grown, sheltered		102	129	162	199	241	289
<i>Quercus petraea</i>	Average site, garden, parkland		115	143	177	216	260	310
	Poor ground and/or some exposure		133	166	204	248	298	354
	Woodland boundary pollard, or open woodland		115	143	177	216	260	310
	Inside woodland		217	297	392	501	625	764
<b>Ash</b>	Good site, open grown, sheltered		89	117	150	188	232	281
<i>Fraxinus excelsior</i>	Average site, garden, parkland		106	137	174	217	265	319
	Woodland boundary pollard, or open woodland		172	244	328	425	536	659
	Inside woodland		138	177	223	276	336	403
<b>Austrian Pine</b>	Champion tree potential (ideal site conditions)		67	83	102	124	149	178
<i>Pinus nigra ssp nigra</i>	Good site, open grown, sheltered		80	100	124	151	182	217
	Average site, garden, parkland		80	100	124	151	182	217
	Poor ground and/or some exposure		83	106	134	166	202	243
<b>Black Mulberry</b>	Good site, open grown, sheltered		242	340	456	590	741	910
<i>Morus nigra</i>	Average site, garden, parkland		313	444	599	778	981	1207
<b>Common Lime</b>	Champion tree potential (ideal site conditions)		82	96	112	131	153	177
<i>Tilia x europaea</i>	Good site, open grown, sheltered		80	97	118	142	169	199
	Average site, garden, parkland		80	100	124	151	182	217
	Churchyard		80	97	118	142	169	199
<b>Deodar Cedar</b>	Champion tree potential (ideal site conditions)		51	65	81	100	121	145
<i>Cedrus deodara</i>	Good site, open grown, sheltered		57	72	89	108	130	155
	Average site, garden, parkland		69	89	112	138	169	202
<b>Holly</b>	Inside woodland		113	149	193	243	299	362
<i>Ilex aquifolium</i>								
<b>Horse Chestnut</b>	Good site, open grown, sheltered		89	117	150	188	232	281
<i>Aesculus hippocastanum</i>	Average site, garden, parkland		100	135	177	225	279	340
	Churchyard		89	117	150	188	232	281
<b>Plane</b>	Champion tree potential (ideal site conditions)		72	82	93	106	121	138
<i>Platanus sp.</i>	Good site, open grown, sheltered		67	83	102	124	149	178
	Average site, garden, parkland		80	100	124	151	182	217
	Churchyard		80	100	124	151	182	217
<b>Red Oak</b>	Champion tree potential (ideal site conditions)		67	83	102	124	149	178
<i>Quercus rubra</i>	Good site, open grown, sheltered		80	100	124	151	182	217
	Average site, garden, parkland		102	129	162	199	241	289
<b>Sweet Chestnut</b>	Good site, open grown, sheltered		80	100	124	151	182	217
<i>Castanea sativa</i>	Average site, garden, parkland		83	106	134	166	202	243
	Poor ground and/or some exposure		100	135	177	225	279	340
<b>Sycamore</b>	Good site, open grown, sheltered		67	80	94	111	129	150
<i>Acer pseudoplatanus</i>	Average site, garden, parkland		67	83	102	124	149	178
	Churchyard		67	83	102	124	149	178
	Poor ground and/or some exposure		83	106	134	166	202	243
<b>Yew</b>	Average site, garden, parkland		113	149	193	243	299	362
<i>Taxus sp.</i>	Churchyard		189	260	344	440	550	673
	Poor ground and/or some exposure		242	340	456	590	741	910

## Estimates of age for oaks with girth 2.5m - 20.0m

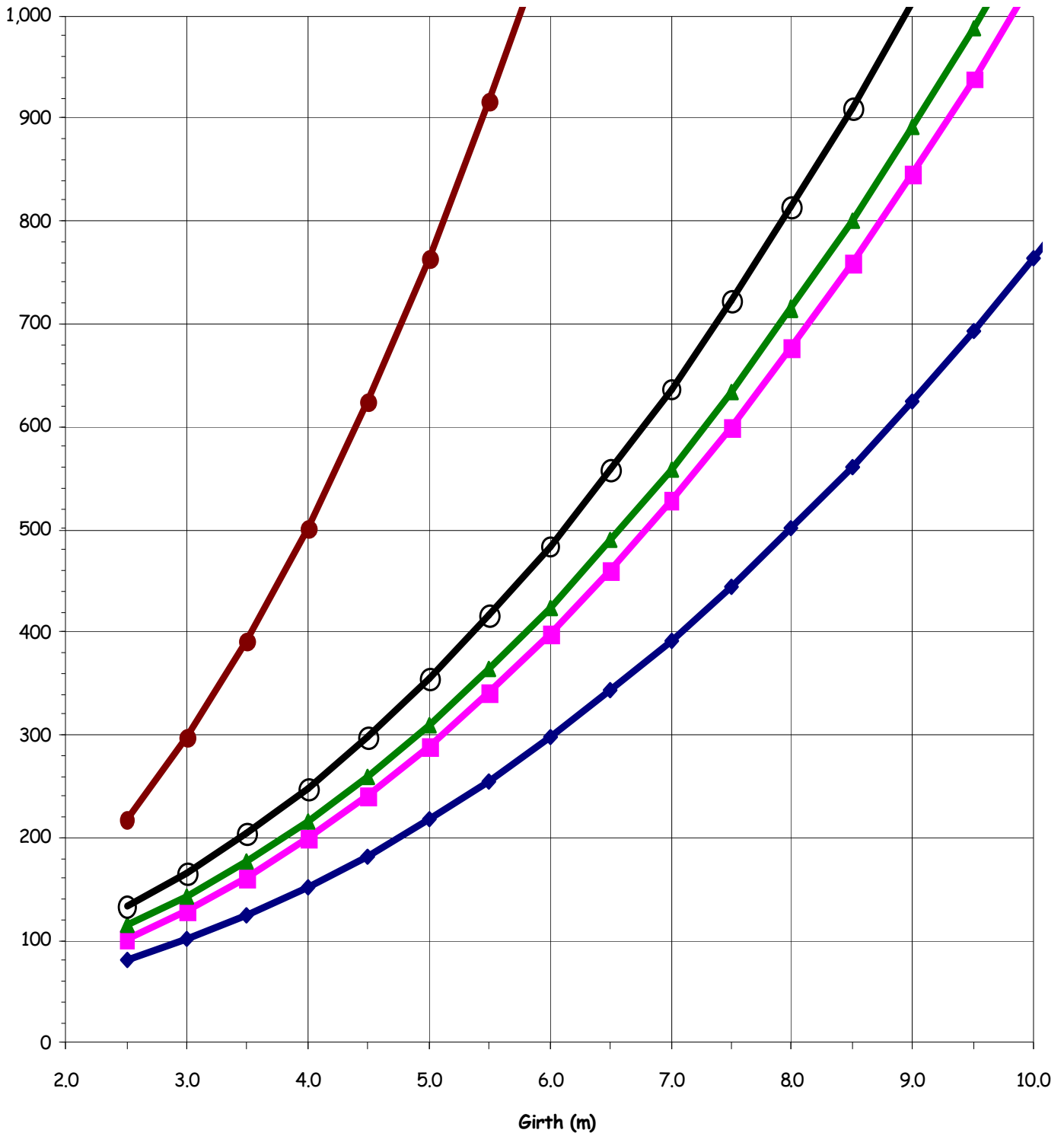
and generalised estimates for most large trees

Most large trees			Girth (m)	English and Sessile OAK ( <i>Quercus robur</i> & <i>Q. petraea</i> )					
Not crowded	Slightly crowded	Crowded		Ideal site	Good - sheltered	Average - gdn/park	Poor - exposed	Open woodland	Inside woodland
98	153	205	2.5	80	102	115	133	115	217
118	184	246	3.0	100	129	143	166	143	297
138	215	287	3.5	124	162	177	204	177	392
157	245	328	4.0	151	199	216	248	216	501
177	276	369	4.5	182	241	260	298	260	625
197	307	410	5.0	217	289	310	354	310	764
217	337	451	5.5	255	341	364	416	364	917
236	368	492	6	297	398	424	484	424	1,084
256	399	533	6.5	343	460	489	557	489	1,267
276	429	574	7	392	528	559	637	559	1,463
295	460	615	7.5	445	600	634	722	634	1,675
315	491	656	8	501	677	715	813	715	1,901
335	521	697	8.5	561	759	800	911	800	2,141
354	552	738	9	625	846	891	1,014	891	2,396
374	583	779	9.5	693	938	988	1,123	988	2,666
394	613	820	10	764	1,035	1,089	1,237	1,089	2,950
413	644	861	10.5	838	1,137	1,195	1,358	1,195	3,249
433	675	902	11	917	1,245	1,307	1,485	1,307	3,563
453	706	943	11.5	999	1,357	1,424	1,617	1,424	3,891
472	736	984	12	1,084	1,474	1,546	1,756	1,546	4,233
492	767	1,025	12.5	1,174	1,596	1,673	1,900	1,673	4,591
512	798	1,066	13	1,267	1,722	1,806	2,050	1,806	4,962
531	828	1,107	13.5	1,363	1,854	1,943	2,206	1,943	5,349
551	859	1,148	14	1,463	1,991	2,086	2,368	2,086	5,750
571	890	1,189	14.5	1,567	2,133	2,234	2,536	2,234	6,165
591	920	1,230	15	1,675	2,280	2,388	2,709	2,388	6,595
610	951	1,270	15.5	1,786	2,432	2,546	2,889	2,546	7,040
630	982	1,311	16	1,901	2,589	2,710	3,074	2,710	7,499
650	1,012	1,352	16.5	2,019	2,751	2,879	3,266	2,879	7,973
669	1,043	1,393	17	2,141	2,917	3,053	3,463	3,053	8,461
689	1,074	1,434	17.5	2,267	3,089	3,232	3,666	3,232	8,964
709	1,104	1,475	18	2,396	3,266	3,416	3,875	3,416	9,482
728	1,135	1,516	18.5	2,530	3,447	3,606	4,090	3,606	10,014
748	1,166	1,557	19	2,666	3,634	3,801	4,311	3,801	10,560
768	1,196	1,598	19.5	2,807	3,826	4,001	4,538	4,001	11,122
787	1,227	1,639	20	2,950	4,022	4,206	4,770	4,206	11,698

NB: Growing conditions are same as in previous table - see that for more detailed description.

## Graph of age-girth relationship for oak

Age (years)



- ◆ Champion tree potential (ideal site conditions)
- Good site, open grown, sheltered
- ▲ Average site, garden, parkland, woodland boundary pollard, or open woodland
- Poor ground and/or some exposure
- Inside woodland