Silviculture for Fine Oaks in Britain

Q. What exactly are we trying to achieve?
A. Fine oaks, for ultimate sale.

The current price curve for oak timber puts most money on veneer butts, then barrel staves, first quality planking, beam, lower grade planking and finally fencing, before dropping to firewood grades. The first two are rare in Britain and Ireland, requiring slow and even growth of 8 to 10 rings per centimetre of radius for well over 150 years and in our windy climate their crowns may become much broken up. First quality planking commands a good price, at sizes from 60cm diameter at breast height upwards and this will require well over a century if growth averages 4 rings per centimetre (10 rings per inch). To achieve, and retain this sort of steady growth requires trees with ever-expanding crowns. The final crop is likely to stand between 12 and 15 metres apart, depending on the oak grown – pedunculate needs more room than sessile – and on the site characteristics of soil and climate.

Fine oak, like a well-matured Stilton or claret of a famous vintage is always in demand. All begin with carefully chosen ingredients, with proper tending and when mature, all require skilled presentation – and all three, being products of Nature, carry a degree of unpredictability which it is the manager's duty to interpret and to steer to perfection. While the Stilton may hold at its peak for a week, and claret for a decade, a stand of fine oak can achieve fame, then be held in readiness for a quarter, or even half a century until market conditions are right.

The "ingredients" for fine oak are an acorn, suitable soil and climate. Blending these for the final product is the art of the silviculturist. The Oak Group within BIHIP is working towards breeding oak whose acorns can be virtually guaranteed to grow into fine trees, as described elsewhere on this website. Selected acorns, from a tested seed source, grown by a skilled nurseryman into good quality transplants form the foundation for a crop of fine oaks. Thereafter, the forest owners and managers have a limited influence. At the forest scale the climate is fixed but at the stand level, especially when the trees are young, the microclimate can be modified by adjacent shelter, or even light top cover. Soil can sometimes be improved by drainage, subsoiling or phosphate fertilizing; in later years, by leaf litter from trees in mixture with the oaks.

If a final crop of between 50 trees (14 m apart) and 100 trees (10 m apart) is envisaged, how many should be planted? A spacing of 1.5 x 1.5m requires over 4000 per hectare; at 2 x 2 m the figure is 2500. All need to be purchased, planted and weeded but (at 2 x 2m) about 2400 of these plants will be removed in cleanings, or thinnings as cordwood, fencing or lower-grade planking, to leave but the best to maturity. What is more, a pure oak planting is just as much monoculture as wall-to-wall Sitka, so many careful oak growers have always planted mixtures in groups or in lines, tending them thereafter to give well-considered results suited to the growing site. Care is needed to avoid "pyjama stripes" in prominent views!

Simple rules apply. The ideal nurse, or "infill", will last to the end of the oak rotation; will not outgrow it and will not make a padded down acid litter; in addition, should grey squirrels become active the nurse will be damaged in preference to the oak. Thus hornbeam, lime, alder, sycamore and beech are candidates. Lime outgrows oak but trees removed as thinnings will coppice; alder and sycamore will also grow fast and coppice, but will not last the full course and beech can be too aggressive as well as making a felted, acid litter layer which can deprive the oak of moisture in dry times. Among the conifers Norway spruce is the classic nurse and western red cedar is often better, though less likely to survive into the oaks' final years. Using a nurse can improve the growing conditions and form of the oaks, can retain better site fertility, increase the range of habitats, keep the oak stems shaded and also save useful sums in plants and tending. Different nurses, and combinations of nurse species can be used but in all cases it is Nurse's duty to care for her charges, the Oaks.

With this in mind, the planting can be planned.

Once planted, the battle begins. Rabbits, deer, even wild boar may need to be controlled – and worst of all, grey squirrels' bark gnawing which has been observed on oak from year six, to trees of 125 years. Bracken, bramble, unwanted coppice and other weeds must be adequately controlled to let the young oaks develop until canopy is closed. The crop then enters a critical time – just when it is most impenetrable with bramble, honeysuckle or old man's beard. This is where a wise choice of nurse species can help. Hornbeam, lime, alder and western red cedar suppress weed growth well and allow access so that oaks may be inspected, freed from clinging weeds and pruned, including removal of low forks which result from frost damage. Over-competitive nurses, or seeded-in goat willow can also be cut out in good time.

Brash (pruning for access) as early as practical. Reduce costs by only brashing potential fine oaks and enough nurses to allow ready access, when the oaks can be re-visited and further pruned before the long, repeating cycle of thinnings is begun.

British literature on thinning tends to concentrate on "what shall I remove -- how much volume will it produce"?. When growing fine oaks the boot is on the other foot. What trees am I favouring? How far apart? The aim should be to bring on not only (in racing terms) the Winners but also enough for the Each-way bets. Should a potential winner stumble at age 80 due to gale damage, there should be a Second ready to forge ahead in its place.

The late Charles Venables (who supplied the oak for York Minster after the fires in 1984 and for Windsor Castle in 1992) insisted that an even rate of growth is of prime importance for producing stable oak timber. This requires a steady increase of crown room so before each thinning, inspection of the chosen trees should show a few fairly small dead branches in the lower crown but a vigorous main canopy.

Pure oak is a difficult crop to thin in its later and most important years. Thinning in a pure oak stand in later years can lead to crown damage. Oak-sized holes are left in the canopy, thus exposing the trunks of the remaining crop to the risk of epicormic shoots (whiskers on the stem) developing due to extra light. All the nurse species discussed earlier are softer trees whose removal will cause minimum damage to retained oaks. Shade-tolerant nurses will be capable of remaining as a trunk-shielding understorey, preferably until after the final oak thinning.

While our best oak is in the long process of growth, what is happening inside the tree? How fast are they growing? Borings (the removal of small cores) can damage first-quality trees, but before a thinning is marked, trees of similar sizes and crown spreads, which are to be removed can be bored to gain an insight into the current rate of growth as measured by ring width. Note also that trees in the future, derived from "BIHIP's Best Acorns" should not have ring or star shake hidden within them. Skilled and well-supervised felling gangs will not cause butt damage but roots can be severely cut by heavy use of big machinery on wet soil. Early establishment of access routes should reduce this risk.

The final thinning is particularly critical as large trees will be removed, yet the chosen final crop individuals are likely to have 25 or more years to grow. At this thinning it is less important to keep the steady growth rate of earlier years. The last 25 years of an oak's growth is all sapwood, around an increasing and valuable heartwood core. Sapwood is of little value to the timber merchant, whose proper interest is in the dark, brown heartwood – so fulfilling the Gospel which says "..where a man's treasure is, there will his heart be also".

Bede Howell, Chartered Forester, November 2010