HYBRID POPULATIONS IN SOME NATIVE TREES RAISED FROM SEED

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Where related species grow in geographically adjacent areas, they can often be separated on ecological requirements as well as on morphological characters, and hence remain distinct given stable natural conditions. However, the intervention of mankind creates disturbance on many levels which modifies traditional habitats and may enable otherwise stable plant communities to expand and invade new areas. With taxonomically allied species involved in a dynamic situation, the resulting hybrid populations are not infrequent and generally occupy habitats intermediate between those of the putative parents.

Some native trees and shrubs raised from seed in the nursery may be represented by substantial hybrid populations, with varying significance for the grower and planter. However, the bulk of species raised from seed remain true-to-type, and the incidence of hybridization is far greater in cultivation, whether by chance or design.

BETULA

The two tree-like species currently recognised are *Betula pendula (B. verrucosa)*, the silver birch, and *B. pubescens*, the downy birch. They are readily separable by chromosome number, habit, trunk, shoot, leaf and fruiting characteristics, but, nevertheless, were formerly grouped under the blanket name *Betula alba*, which is still found in some seed lists.

Whilst direct hybrids between the species are apparently rare and are sterile, a very numerous population exists which combines some features of both species in varying degrees in the individual, and can be found in the wild and in cultivation. This fertile race is postulated to be of hybrid origin and is associated with the re-establishment of vegetation after a primary forest is cleared; hence in Britain's disturbed landscape the hybrid birch is common.

The bulk of mature planted birch trees possess the rugged white bark with black ridges typical of *Betula pendula*, which suggests that nurserymen a generation ago used seed collected from a pure stand of silver birch for seedling production.

Much recent planting incorporates material obviously influenced by *Betula pubescens*. As the trees mature, trunk colouration is often at best a creamy-brown, and the bark is smooth, and peels off in flakes.

This apparent anomaly may be explained by the collection of home-produced seed in an indiscriminate fashion in recent years, this would doubtless please the conservationist element among amenity planting groups but not the private gardener seeking a true silver birch. The propagating nurseryman must learn to recognise authentic sources of seed supply, if home-collecting, or to purchase seed of known provenance.

In conclusion, the grower should seek to produce only pure *Betula pendula* if his aim is to sell "silver birch" trees; but even this affirmation is confounded by the fact that hybrid birches with pure white trunks are by no mans uncommon in cultivation Doubtless, as mature plants they are valued, but with open-pollination their progeny must necessarily be of mixed quality.

CRATAEGUS

The two native species of hawthorn, *Crataegus monogyna* and *C. laevigata (C. oxyacantha)* are distinct in vegetative and floral morphology, and inhabit quite different soil regimes, the former of light, well-drained soils, i.e. sands and chalk, the latter associated with heavy, poorly-drained situations in woodlands. Both species are self-incompatible, and the necessity to out-breed, coupled with the loss of ecological barriers in past centuries has established a massive hybrid population. *(Crataegus × media)*. The hybrid is self-compatible, and with back-crossing to both parental species, has produced every possible variation in leaf-shape from the dissected form of *C. monogyna* to the lightly lobed *C. laevigata*.

The qualities of free fruiting and abundant seed production and tolerance of a broad spectrum of soil types has enabled the hybrid thorn to be used as a cheap form of hedging for hundreds of years. By contrast, the pure species are limited even in their most favourable habitats; *Crataegus laevigata*, in particular, is close to extinction

For the nurseryman, the genetic diversity found within the hybrid population is currently largely reflected in the flower form and colouration, both single and double, from pure white, and pink to red shades, these selections being propagated by vegetative means. However, the seedling rootstocks required for budding vary considerably in their suitability, and require careful selection. By inference, perhaps trees selected for seed production should be within populations close to *Crataegus laevigata*, which has a more robust habit of growth than *C. monogyna*.

In essence, the availability of hawthorn in quantity for hedging and amenity planting, and the diversity of clonal se-

lections for ornament are directly the result of the genetic combination of the two species. If this combination and recombination had not been possible, it is unlikely that hawthorn would have achieved anything other than local importance for hedging, and Britain's landscape and gardens would today be rather different

QUERCUS

Numerous botanical works attest to the abilities of the two British oaks, *Quercus robur* and *Q. petraea (Q. sessiliflora)* to hybridise. Both species are variable in vegetative characters, so that identification is not always easy and not all writers are agreed that hybridization is extensive. Indeed, research has indicated that cross-pollination between the species is of a low order.

The common oak, *Quercus robur* is distinguished by the following: leaves oblong or obovate, broadly lobed at the base, hairless when mature, and with a short petiole, acorns several together on common stalks.

The durmast or sessile oak, *Q. petraea* has elliptical leaves, tapering to the base, which is unlobed, distinctly petiolate, with downy hairs beneath, when mature associated with the veins. Acorns unstalked

In practice, many trees in south-east England, while generally agreeing with the description of *Quercus robur* above, may have leaves only narrowly lobed at the base, this feature may or may not be used in argument to assert slight introgresson by *Quercus petraea.*

While the subject of hybrid oaks remains academic, the nurseryman need only concern himself with collecting acorns for propagation purposes from those trees which produce high quality seedlings for tree production.

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