

Some Notes on Shelter Belts in Irish Coastal Regions*

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THE frequency and severity of gale force winds and the average velocity of the wind in Ireland is regarded as being amongst the highest for any country in Europe and, of course, this factor of wind is most pronounced along our coast lines. The influence of this aspect of climate on tree growth and on the trees we can grow here is critical to the Forester and is a problem that he must study with constant care even though he is not normally concerned with shelter belts as such.

In considering the problem of selecting the right tree species for shelter belt planting anywhere we look for the tree that will withstand the force of the fiercest gale and yet continue to increase in height and maintain its vigour and form. There are not so many tree species that would fulfil these requirements but if we must, as we will now, consider trees for shelter at or near the sea the test is even more severe because we must consider also the greater unimpeded strength of the wind laden with salt spray and very often with rasping sand as well.

Indeed, in this regard it may be of interest to recall that salt can be found deposited inland for as much as 25 miles after severe gales and in the ordinary way is deposited and has considerable influence for some ten miles or more inland from the sea.

However, in discussing our subject here I will confine myself to shelter belts beside the sea or within a mile or so of the sea.

Before one can decide what tree species are most suitable for the job one has to consider the type of ground on which the belt has to be grown and the purpose for which it is required.

Along the east and south coast of Ireland and particularly in the east, one usually meets with mineral soils on farms near the sea but along the western seaboard peaty surface conditions are not infrequent and may at times come right down to the sea. Another type which is met on any coastline but perhaps more particularly in the north and north-west is the pure sand with or without much surface holding vegetation.

The mineral soil usually widens the choice of species whereas the peat type reduces it to only two or three species. The pure sands are a difficult and complex problem which we would not have time to discuss now, and which, when undertaken is not always rewarded with success.

Again the shelter belt may be required for a number of different purposes but the needs more usually met with are shelter or amenity

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for dwellings and houses, shelter for livestock, shelter from shifting or wind blown sands and for protecting permanent tillage or gardens. More often than not of course the belt is intended as an all purpose one providing some or all of the foregoing requirements. For cattle shelter, and indeed for a good all purpose belt one requires trees furnished right down to the ground and excluding through draughts in so far as is possible to procure. On the other hand for protection of permanent tillage, fruit and garden crops a more open or permeable belt is often preferred and this type of belt is often favoured near dwelling houses where some circulation of wind is desirable. In sheltering buildings it is important not to plant trees too near—a general fault in my opinion, and I believe that 50 yards should be a minimum distance from any dwelling place. It is a good thing to have plenty of light and movement of air round a house while to sleep or try to sleep in a house within twenty yards of an eighty foot high tree in a full gale is not a restful experience for anyone who is sensitive to noise.

To meet the requirements I have mentioned and to give quick results, which is of course the first thing people ask for, my list of trees would be, with conifers first :—

Monterey pine (*Pinus radiata*); Monterey cypress (*Cupressus macrocarpa*); Austrian pine (*Pinus nigra* var. *Austriaca*); Contorta or Shore pine (*Pinus contorta*); Mountain pine (*Pinus mugo*); Sitka spruce (*Picea sitchensis*) and Lawson Cypress (*Chamaecyparis lawsoniana*). Of the broad leaved trees Sycamore (*Acer pseudoplatanus*) is always recommended as also is Beech (*Fagus sylvatica*) and Oak (*Quercus robur*) but the latter two trees are slow growers and not really effective. Three lesser known trees which are showing great promise as shelter trees on dry mineral soils are Turkey oak (*Quercus cerris*) and the two species *Eucalyptus urnigera* and *Eucalyptus Johnstoni*.

Monterey pine and Monterey cypress are two tree species which have grown with great vigour and effect around the coasts of Ireland and in my own view are the best trees we have for shelter belt work near the sea. They may be difficult to establish and are best confined to dry mineral soil types, though Monterey pine gives good performance on sand dune ground also.

Austrian pine is also a good shelter tree but is slower growing and may not give as much low cover as the others just mentioned.

Lawson Cypress may prove a very useful species to use in conjunction with other species on the outside windward line or lines of the shelter belt to give low cover as this is a very good tree for holding its foliage right down to the ground.

On peats contorta pine helped by an ounce of G.M.P. at planting is undoubtedly the best grower though in certain conditions it is not too stable a tree. Grown in combination with contorta pine for low cover the mountain pine can be very effective though a very much slower grower. For this reason and due to the fact that it does not grow high enough mountain pine is not recommended for use pure in shelter belts.

Sitka spruce may have its place in seaboard planting on the better peat types or on moist or rushy soil types but is not recommended for dry soil or sandy types of ground and, to be effective the belt should be planted in some depth. Belts of three or four rows or less at six or eight feet spacing will not prosper well or give as good results as wider belts.

With regard to the broad leaved trees they are not likely to be very effective or afford sufficient shelter unless grown in considerable depth and are better used in mixture with the conifers as marginal rows or belts. However, though comparatively untried the two eucalypt species are amongst the fastest growing trees we have and are very wind firm besides being evergreen and very comely in appearance. They will do well on dry mineral soils but cannot as yet be recommended for peats and soft heavy soil types.

Finally, a word about the width of belts, positioning and the spacing of the individual trees. A great deal of research has been done in recent times but results have not been entirely conclusive as to the proper width and actual effect of the shelter, besides envisaging shelter belts of 33 yards at a minimum in width which, however ideal, might be quite unacceptable to most small farmers due to non-availability of ground. Certainly the wider the belt is, up to a point, the more efficient it becomes, particularly beside the sea where the windward rows are usually severely cut down and stunted by the wind. As few as a single or one or two rows at 6'-8' spacing or thereabouts of trees usually fail in their purpose and one should aim at much wider belts if possible, but in the final reckoning the width of the belt is determined by land availability and one cannot be dogmatic on the subject. In some countries we find them recommending that 5% of the total farm area should be under shelter belts so that your 50-acre farmer would have to plant $2\frac{1}{2}$ acres.

As to the spacing of the trees it is generally accepted that with faster growing conifers wider spacings than are normally used in Forestry may be adopted. I think that spacings 6'-8' between the plants and 8' to 10' between the rows of plants will give good results provided the ground is not too infertile. To this I would add that to have a good shelter there should be at least five rows if possible which is tantamount to suggesting a belt of between 32' and 40' at its establishment. Some people "stagger" the trees in the rows and this is quite a good line.

The man who knows the locality is the man to judge best the prevalent wind which may vary very much from place to place. The south-west wind is the prevalent wind in Ireland but again it may not always be the damaging or obnoxious wind and this can only be determined by local knowledge. In short to protect the maximum area a shelter belt should as far as possible have its long axis perpendicular to the direction of the wind against which protection is required.

Estimates are various as to the amount of protection afforded by a

good tree belt but reduction of wind flow does extend on the leeward side for a distance of twenty times the height of the trees and the point of most effective shelter is regarded as being at a leeward distance of three times the height of the belt. Therefore with a belt of trees 50' high we would have best protection at 150' and at least some protection at 1,000'. The old idea was that you got appreciable protection up to 10 times the height of the belt on the leeward side, and this does seem to be a good averaging out of the numerous more recent calculations.

Good shelter belts give great benefits but there is no facile rule of thumb for their establishment and the matter requires careful study and the help of experienced knowledge as to selection of species, spacing of species, and positioning and width of belt, if the undertaking is to be made worth while and the results crowned with success.
