

Needle Fusion in *Pinus contorta* in Ireland.

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THE disorder known as fused needle disease of Pines has been known in the South of England for more than twenty years (Jones, 1938) in California, in South Africa and Australia and New Zealand (Young 1940) where it has received a great deal of attention. Apart from a general unhealthy appearance and lack of vigour the disease manifests itself most obviously in the failure of the needles to elongate, or even at times to emerge from the sheath. They are not actually "fused" in the usual sense, and can be separated easily by the fingers.

The condition was first identified in Ireland in Bansha State Forest, Co. Tipperary, by Mr. R. Lines of the British Forestry Commission in the course of a tour of Irish stands of *Pinus contorta* in October 1958, and has since been found in the same species in Ballyhoura forest, Co. Cork. In both these areas the affected stands are growing on an infertile podsol, with ironpan, of old red sandstone origin. Both were planted (Ballyhoura in 1926 and Bansha in 1935) without ground preparation and without manures, a practice no longer current in such areas. Only a small proportion of the trees in these areas is affected although the crops in which such trees occur are far from satisfactory. In Bansha the needle fusion symptom is accompanied by a dying back of the upper leading shoots which seems to have occurred quite suddenly between two growing seasons without any remarkable falling off in height growth in the last years.

Perhaps the most thorough investigation of the disorder has been made by Young (1940). Working in Queensland, Australia, with *Pinus taeda* and *P. caribaea* he obtained a marked improvement in affected crops by the application of phosphatic fertilizers, by direct and continuous feeding with carbohydrates via cut roots, and by the application of litter. In a series of pot experiments diseased seedlings recovered when planted in cowdung or in a mixture of soil and cowdung but reverted to the diseased condition at the end of the first or second growing season. He concluded that the action of the phosphates was mainly indirect, in stimulating the development of mycorrhizas which, in addition to making nitrogen compounds and mineral salts more readily available to the tree, also supplied an essential part of the tree's carbohydrate requirement, obtained from fresh organic matter in the soil. He thought that the direct nutritive action of the phosphates was slight.

An unexplained response to the application of boron to diseased *Pinus muricata* was obtained by Ludbrook (1939). Similar applications to *P. ponderosa* and *P. radiata* gave negative results.

More recent observations by Jones (1952) suggest that the disorder is caused by a water deficiency at a critical stage of growth, not necessarily due to a simple physical lack of water in the soil.

The extent of the disorder in Ireland is not yet known but it is considered unlikely to be of any practical importance. A four acre block in the affected area in Bansha forest was the site of an experiment intended to compare several methods of manual ground cultivation before planting and the effects of different phosphatic fertilizers applied at the time of planting. No differences can now be detected between the various treatments, but the block as a whole now carries perhaps the best crop of *Pinus contorta* in Ireland.

It is understood that an excursion to Bansha forest will take place during the coming summer, when members will have an opportunity to see the area for themselves.

References:

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