

The 'born again' poplar and willow breeding programme



Poplars and willow research in New Zealand had been dead for the last five or six years due to funding cuts. When this happened many of us wondered the sense of such a decision. This was reiterated after the February '04 event or the invasion of willow sawfly. Continuous research in this area is critical for hill country sustainability and river protection, considering the breeds we use today have taken in excess of twenty years to develop.

Recently the Ministry of Agriculture and Forestry (MAF) announced the allocation of \$735,000 for the Regional Councils' Willow and Poplar Research Collective starting from 2009/10 for four years. This figure will be matched collectively by regional councils throughout the country. The recommencement of this breeding programme is excellent news.

The programme has components that include:

- The assessment of non released or non commercial varieties or clones that are in old trials scattered around the hill country to see if any of these are out performing the current commercial clones. Often these trials were planted over twenty years ago and are now showing their true qualities.
- To enhance poplar and willow genetic stock to develop new clones that have improved soil stabilisation qualities.
- Some additional technology transfer.

The programme will be led by Plant and Food (formerly Hort Research).

The funding from MAF is only for a four year period. This is an insufficient time period to achieve any advances in breeding of new poplar and willow clones. An effective tree breeding programme needs a lifetime of years to make improvements. One of the conditions of the MAF funding is that the regional council collective seek commercial funding to continue the programme after four year period has ended.

Poplars and willows have been an integral part of the rural landscape for many years. They have mostly been planted for hill country erosion control and on the flood plains and river banks as flood protection works. Their effectiveness was shown by research commissioned by Federated Farmers following the 1992 winter. This research showed that adequately spaced poplars reduced erosion by up to 70%. Closed canopy forestry, indigenous bush or scrub reduced the incidence of erosion by over 90%.


The effectiveness of poplars in soil conservation is due to their roots acting as a vast mechanical anchor, along with the tree's ability to draw up water from the soil. This reduces water pressure in the soil pores and thereby lessening the risk of large scale soil movement. The big advantage of poplars and willows is that they can be grown in conjunction with continued pastoral farming.

Soil conservation scientists in New Zealand have been researching and breeding poplars and willows since the 1950's. Between 1950 and the late 1970's, over 200 different poplar varieties were imported from Europe, America and Asia for research and breeding. These form the parentage of the clones we plant today.

Most people are familiar with the narrow columnar appearance of Lombardy poplar, or the more spreading crown of Frimley, both of which were imported clones from Europe. However the arrival of poplar rust in 1973 which causes early leaf fall, made these clones unsuitable for continued use.

When the rusts arrived the poplar breeding programme had been going for nearly twenty years. This programme, although still very young in tree plant breeding terms, proved invaluable as it meant there were new poplar clones that were better suited to New Zealand climatic conditions ready to go. These new clones replaced the diseased Lombardi's and are common in the landscape today.

As a consequence, the major consideration of the breeding programme since the early 1970's has focused on the degree of resistance to poplar rusts and leaf spot. Other useful characteristics which are also considered in breeding, include drought tolerance; leaf shape (which affects wind tolerance), form, improved timber



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qualities (e.g. wood density); reduced incidence of blackheart; low epicormic production following pruning; and high leaf biomass production for livestock fodder.

The ideal poplar tree for erosion control would be a tree with narrow columnar form like the Lombardi, have small branches that don't split after 15-20 years, are rust and leaf spot resistant, possum resistant, can be established in the presence of livestock, the leaves hold on longer into the winter so that its leaf fall can be managed for stock feed during periods of feed pinches, bud burst is later so any thistle spraying can be undertaken without harming the tree, and its use-by date is 200 years rather than 30-40 years. With the funding hopefully we are several steps closer to this 'perfect' tree!

Resurrecting the poplar and willow breeding programme is a real positive step forward that needs to be continued for a life time rather than four years. Further to this faster progress needs to be made with higher levels of funding. We are fortunate we have some old soil conservators that are passionate about what they do driving this essential research and have managed to get the old breeding programme born again.