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# The Andean Alder (*Alnus acuminata*) in New Zealand

N. Ledgard and S. Halloy

New Zealand's environment is good for forest growing and introduced trees from many countries are performing well. At regular intervals in the past a particular species will grab the headlines as a potential new "wonder plant", with all the attributes needed to fulfil a forester's dream. Recent examples are *Paulownia* species and, to a lesser extent, *Robinia pseudo-acacia* (Krijgsman, 1989). Andean alder (*Alnus acuminata*) looks to be acquiring the credentials to become an addition to the list. A recent article on the species in "Growing Today" (Halloy, 1991) opens with an editorial statement that could be misleading. It reads: "The multiple-use Andean alder grows almost anywhere, is faster than pine, has good timber, provides stock fodder and food for bees, and improves soil". As the article goes on to explain, Andean alder has yet to be trialled properly in New Zealand.

## The Success of New Plants

The list of introduced tree species which have glowing credentials from other countries and are currently growing well in New Zealand is long, but very few of them feature in our production or protection forestry estates. The reasons are several. A number of species may grow well and demonstrate good end-use qualities, but it is exceedingly difficult to obtain the financial backing to establish a commercial estate of sufficient quality and size to encourage profitable processing and marketing. In addition, the establishment and silvicultural techniques needed to grow these new species successfully are often not quite so simple as they first seem.

Thus the final success of a species depends on a mix of ecological suitability, silvicultural skills, end-use value and marketing expertise. For the Andean alder we are only at the stage of saying: "Probable good ecological suitability (for most New Zealand areas according to selections), potential product

value (timber, fibre, shelter, fodder, soil protection and improvement)". More research is needed before reliable recommendations for management and use can be made.

## The Species

Andean alder is the southernmost species of the genus *Alnus*; its distribution stretches along the Andes and Central American mountains from southern Mexico to 28 S in north-west Argentina. It is a fast-growing pioneering deciduous tree that reaches up to 25 m in height (averaging 10-15 m) and 40 cm in diameter. Like other alders, it has root nodules that host nitrogen-fixing bacteria and mycorrhizal fungi which assist in nutrient uptake. Unlike other alders, it will grow on drier soils and is not restricted to moist sites. In South America this allows it to cover whole mountainsides in continuous almost mono-specific woods. In north-west Argentina alone it covers an estimated 650,000 ha. The species is harvested for sawlogs (construction and packaging), pulp and firewood and is ranked amongst the 65 timber species of major importance for Argentina.

## New Zealand Plantings

So far as we know, the species has been in New Zealand for less than 20 years. The Forest Research Institute acquired a provenance from a low-altitude site in north-west Argentina in 1972 and has had plants growing at its Rangiora nursery and at 850 m in the Craigieburn Range ever since (Ledgard, 1978). As with other upright alders (e.g., *A. glutinosa* and *A. rubra*), early growth at Rangiora was fast (1 m annually) but growth slowed down considerably after four to five years. After 15 years the best trees now average 9 m in height and 18 cm in diameter (maximum growth rates of 60 cm and 1.2 cm/year, respectively). They appear in reasonable health, although some of the tops have been broken by wind and the stems are covered in lichens. At Craigieburn the tallest trees are 5 m, and were regularly knocked back by frost in their early years. Small numbers of trees were planted privately at other sites in the South Island (such as on the West Coast), but their performance suffered from poor establishment practices (particu-

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larly lack of weed control) and animal damage (notably possums).

Two semi-evergreen types of this species, from Mexico and Costa Rica, were imported and tried by the ex-Ministry of Works at Aokautere and Northland in the late 1970s. The comment on these in a 1986 issue of "Streamlands" (Ministry of Works, 1986) was: "This is the most promising semi-evergreen alder for shelterbelts in New Zealand, but its evaluation is currently in a very early stage. Further trial plantings have been established on a range of North Island sites."

During the last two years the Ministry of Agriculture and Fisheries at Invermay imported a series of new accessions from plants selected for tree form, health, and environmental suitability (concentrating on higher altitudes and lower rainfalls). The first plantings from these accessions have grown over 1.5 m at Mosgiel in two years from seed. Physiological research is underway on these trees to assess their relative stress tolerance.

### Prospects

Recently, the MAF Invermay germplasm programme has obtained 119 new accessions from Argentina. Most of these are being grown by FRI at Rangiora (113 accessions), the rest by MAF. It is quite likely that some of this material will prove suited to harsher South Island sites. Fruit and Trees Division of DSIR is still trialling some of the less cold-tolerant semi-evergreen types on a range of North Island sites, mainly for their advantages as shelter trees.

At this stage it would be irresponsible to predict significant prospects in New Zealand for Andean alder. But it would be as irresponsible to predict failure. Its potential to fill a useful niche in the New Zealand scene depends strongly on the amount of research the species manages to attract and on the amount of interest it sustains. Until more is known, Andean alder is like any new tree, a high-risk investment.



A 1.5m *Alnus acuminata* plant.

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