

Apricot and Cherry Orchards in New Zealand

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Previous experience in Narrow Orchard Systems (NOS)

For over twelve years, we have been carrying out research in New Zealand to develop narrow orchard systems for cherry, apricot and apple. The aim was to develop a planting system that would enable orchards to capture 90% of the incoming light while maintaining good light penetration at the base of the canopies. The system's key innovation was closer row spacing, e.g. 1.5 to 2.5 m, to increase yield/ha. With our cultivars and rootstocks, trees were planted at 3 m within rows in a Planar Cordon system. Two cordons were trained at about a 20 to 30° angle, and 5–6 upright shoots per cordon allowed to develop.

Canopy establishment

Training the canopy to achieve uniform upright shoot development is critical to fill the space quickly.



Young planar cordon cherry trees, with uniform upright shoots (left) and variable upright shoot development, including no upright shoots on the end of the right-hand cordon (right).

Yields and fruit quality

- We achieved consistently high yields, except for years where extreme weather events during spring affected fruit set. For example, top-performing trees of apricot Summer Desire™ were producing 20+ t/ha from Years 3 to 10 (except for Year 8, owing to severe spring weather events).
- High proportions of large fruit can be achieved, particularly for cherry. For example, 85% of export grade fruit were 30 mm or larger in a grower block of 'Lapins' cherry.

Commercial adoption

Significant commercial plantings for narrow-row planar cordon cherry (approximately 300 ha) have occurred in New Zealand. However, there are few new apricot plantings in general, so there has been little uptake so far.

Early adopter growers have commented that:

- Pruning and training of NOS systems is easier to teach to casual staff because there are simple rules.
- Harvesting and pruning are significantly faster because the narrow canopy provides easy access.

The system is tech ready; growers are using platforms to harvest and prune, and narrow, porous canopies improve spray penetration.



Economic modelling

Economic modelling by AgFirst, based on data from growers, has shown that:

- Production on the best commercial NOS blocks is exceeding that of conventional systems e.g. in Year 7, 17 t/ha cf. 10 t/ha.
- Capital development and tree training in the early years is higher in NOS, e.g. establishment: NOS \$NZ140K/ha (includes trellising), traditional \$NZ46K/ha.
- Economic modelling suggests NOS will outperform conventional systems when comparing best practice 15-year internal rate of return: NOS 11 years, conventional 17 years.

New work planned in NOS program

Two new projects are being established in New Zealand to provide further information on establishment and management of NOS orchards that are more suited for pedestrian access.

Effects of tree configuration on productivity

Cherry trees will be established with either 10 or 12 uprights/tree (i.e. 30 or 25 cm spacing) to evaluate: i) effects on light transmission within the canopy and ii) flowering and fruiting in the lower canopy. Whilst the difference in upright numbers is small, we anticipate fewer uprights will greatly improve light and yield in the lower canopy.

Managing recycling of upright shoots

Apricot trees will be grown using different options for recycling upright shoots to retain a shorter pedestrian-style orchard. We will compare: i) recycling shoots every 2–3 years with ii) maintaining upright shoots for longer but restricting the height. Differences in pruning times and productivity will be assessed.

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