

# Experiences of *Cordyline australis* Production at Hewton Nursery®

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## INTRODUCTION

This paper describes the production of *Cordyline australis* and cultivars from bought-in ex-agar propagules and from seed, at Hewton Nursery. It is not necessarily a recommendation for other nurseries with other production systems, simply an insight into what works well in one particular situation. There are 15 species of cordyline ranging from shrubs to small trees. They are spread over a wide area from southeast Asia in the west to Hawaii in the east, taking in Australasia and Polynesia. Some of the species are too tender to grow in northern Europe. *Cordyline australis* is the species commonly grown in Europe. In its native New Zealand it can reach up to 20 m but here it normally reaches only a fraction of that. *Cordyline australis* is a versatile plant that will grow in many different situations and is just as happy in borders or as a spot plant as in pots on patios. *Cordyline australis* requires a well drained soil or growing medium that does not become waterlogged. Plants grown in pots will need some protection during periods of heavy frost.

## GROWING FACILITIES

A shaded glasshouse is used for establishing ex-agar cordylines and pricked-out seedlings. It is equipped with a thermal screen for use during hot days or cold nights. There is also an air-circulating fan which operates for two 15-min periods each hour, both day and night. The beds are covered in Mypex geotextile matting which offers an easy to clean, well drained surface. Over the beds are galvanised frames which support a fleece covering. Initially this is a double layer which is especially important for the more difficult varieties which need more protection. During the early part of the year the heated beds are set at a temperature of 20°C.

## PRODUCTION FROM EX-AGAR PROPAGULES

**Pricking Out.** The ex-agar plants are delivered in small tubs, from which they are removed and then graded prior to pricking into plug trays.

At Hewton the plants are pricked out into 3.5 cm × 3 cm Fertil plugs which contain fertiliser and are well drained. At this stage there are three parameters that have to be considered: the size of plant; depth of sticking; and how to keep the plants humid. Grading is vital at this stage because, whether ex-agar or seedlings, cordylines must not be set too deep. They must be set to the base of the plant and no deeper otherwise the warmth and humidity will cause them to rot off. After pricking out the plants are immediately sprayed over with a hand mister and placed under the fleece.

**Establishment.** It is important to keep the plants humid for the first week or so, while they are putting out their first new roots. At Hewton this is achieved using a triple nozzle misting head on a lance. This allows misting of the foliage but does not wet the plugs which helps avoid rotting. Plants are sprayed over during mid morning but in

hot weather they are sprayed over at least twice more during the day. The glasshouse vents are opened at least 15 cm unless the temperature is below freezing outside in which case they are kept closed. Plants are deemed established when at least 50% of the plugs have roots showing through the side or base. This usually takes about 10 to 14 days but for the slower varieties such as 'Dazzler' during early spring, this can be as long as 21 to 28 days. At establishment the fleece is removed from the stronger varieties for hardening off. For the more demanding varieties one layer of fleece is removed and spraying over continues for a further week. The second layer is then removed and the plugs are treated as established plants.

The time between uncovering and potting can be from as little as four weeks for the stronger plants during the summer to 6 to 8 weeks during the spring for slower growing varieties.

**Potting.** The different grades of plantlet take different lengths of time to reach potting size but because they have already been graded prior to pricking into cell trays it is easy to select all but the smallest plants to be lifted from the several batches and potted together. The plugs are potted on a Mayer potting machine and stood down in a cool multispans. These tunnels are frost free, being kept above 2°C and have air-circulating fans which operate for 20 min h<sup>-1</sup> over the 24 h. The plants can be ready for sale in as little as 8 weeks.

**Crop Nutrition.** As soon as the fleece has been removed the plugs have a regular feed of 15N : 5P : 15K. This continues weekly until they are potted.

**Pest and Disease Control.** Prior to potting the main problems to watch for are basal stem rot and grey mould, *Botrytis* spp. Immediately after pricking out the plugs are drenched with Filex (propamocarb hydrochloride). After uncovering, the plants receive regular sprays of Octave (prochloraz) or Rovral (iprodione). In the author's experience *C. australis* seems reasonably disease free after potting and losses are infrequent.

One disease that can become a problem is basal rot, caused by *Fusarium* species, the symptoms being a collapse of the plant with the base turning black. On larger plants the central leaves can be pulled out showing that the centre of the plant is dead with the disease moving downwards. Although plants pricked out on the nursery are free from the disease, it is never possible to be completely sure of the status of bought-in plants; so all plants are sprayed with Octave every 4 weeks as a preventative.

Pests which may appear occasionally are two-spotted mite, thrips and aphids. Hewton Nursery uses an integrated pest management system to control pests, including the predators amblyseius and hypoaspis for thrips control and aphidius for aphids. *Phytoseilus* are unsuitable because they are not well adapted to moving about on the long thin leaves of cordylines, especially on the smaller plants, and so if mites are seen, a spray of Torque (fenbutatin oxide), Dynamec (abamectin) or Tediion (tetradifon) is applied.

**Quality Control.** The problem with buying-in plants, whether ex-agar or in plugs, is the lack of certainty about, or control over, how they have been treated or handled before reaching your nursery. One delivery of ex-agar plants that arrived at Hewton comprised 20,000 plantlets from Asia that had frozen in the hold of the aircraft. Plants with fungal contaminants have also been received on occasion. Bought-in plugs also come fraught with many problems, mainly pests, weeds and malnutrition.

In this case the only immediate answer is to quarantine them until they can be weeded, fed and the pests dealt with.

A standard report form is filled-out for all plants as soon as they are delivered and a copy sent to the supplier. If ex-agar plants are involved the report is sent after pricking out; if plugs, a report is sent after receipt and another, final report, after potting when a count is made.

## SEED PROPAGATION

Seed for the green *C. australis* is collected from our own plants but seed for the purple form is bought-in. Seed collected on the nursery is picked in September by cutting the fruiting stalks off the plants and is prepared by being left to dry for about 2 weeks. The seed is then removed from the stalks and placed in polythene bags which are then stored in a fridge at 3 to 5°C until sowing in late winter, usually during February.

The growing medium for seed propagation is bought-in in bags. It contains medium grade moss peat, sedge peat, sand and magnesium lime, but no fertiliser or insecticide so that unused compost can be stored until the following year. Intercept 5GR (imidacloprid) is added to the base compost at 280 g m<sup>-3</sup> before each period of seed sowing.

**Stages in Seed Propagation.** First a layer of sand is placed in the bottom of a seed tray, followed by the main bulk of seed medium. At this point 2 g litre<sup>-1</sup> of 12 to 14 month (15N : 8P : 11K) controlled release fertiliser is mixed into the medium. This is levelled and firmed and the seed is sown. A thin layer of peat/sand mix is then sieved on top to hold the seeds and the trays are topped-off with coarse sand to stop the compost from drying out. The first tray of each batch is labelled with the name of the plant, date of sowing, source of seed and number of trays within the batch. The trays are then placed on a heated bed set at 17 to 20°C.

The first seeds germinate around five weeks after sowing and continue to come up for several weeks. The sown trays are retained after pricking out as there is a secondary germination of the remaining seed the following spring.

Seedlings are pricked-out into 3.5 cm × 3 cm Fertil plugs once the first true leaf has grown. Although plants can be grown successfully after pricking-out at the cotyledon stage there are two good reasons to wait until the first true-leaf stage. First, at the cotyledon stage it is not possible to differentiate between green and purple seedlings and therefore to enable separation — it is necessary to wait for the first true leaf. Second, no matter how carefully cotyledon-stage seedlings are pricked out, by the time they are large enough to pot, a high proportion will push themselves out of the plugs and become unstable. This does not occur if plants are pricked out at first leaf stage.

Establishment is rapid and needs little encouragement. The plugs are placed in the same glasshouse as ex-agar plugs. The seedlings, though, are not covered and only get sprayed over, if hot, for the first four or five days. The seedlings receive a regular feed of 15N : 5P : 15K fertiliser and, growing rapidly, are ready for potting in three to four weeks. In truth, the plugs can be left for several weeks before potting, but the longer the roots grow the more difficult they are to pull out of the trays and pot.

Pricking out into plugs makes the seedlings easier and quicker to pot allowing staff to be deployed on to other jobs. Losses after potting are reduced to almost nil. Although the technique increases the initial cost of each plant, the overall cost of each final plant tends to be reduced through the savings involved.