

- during February (Southern Hemisphere) we have more sunlight hours than are usually recorded in August in the Northern Hemisphere.

Chip budding chestnuts onto selected seedling rootstocks allows growers to produce uniform, desirable trees. Orchards, or groves, of such trees should provide the grower with early, substantial yields of high quality nuts.

REFERENCES

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1984 — A YEAR OF PROBLEMS FOR TREE FERNS — SOME GENERAL OBSERVATIONS

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Our nursery has been producing the tree fern, *Sphaeropteris cooperi* [syn. *Cyathea cooperii*], from spores for more than ten years.

Quite suddenly in 1984, although the spores germinated as usual, the prothalli degenerated and production dropped to almost zero. The same phenomenon occurred simultaneously in nurseries in Perth and Sydney.

About the same time, enquiries began to flood in from tree fern growers around Australia whose production from spores had failed. Within a period of two months growers had contacted us from Darwin, Cairns, Brisbane, Adelaide, Melbourne, and a host of other areas all around Australia, all with the same story — their spore production had failed. Buyers informed us there was an Australia-wide shortage of tree ferns.

Over the next four months we increased our spore sowing tenfold and for the next three months I spent my time trying to solve the production problems.

The following things were tried:

1. Spores were collected from many remote areas around Australia from natural tree fern populations — from Bedford

in Western Australia to Atherton in Queensland.

2. Spores were sterilized.

3. A wide range of sowing media were tried, including peat moss, sawdust, pine bark, perlite, vermiculite, and a range of combinations of these.

4. The pH was varied from 4.0 to 8.0

5. The daylength was varied from 8 to 24 hours.

6. The humidity was varied.

7. A wide variety of fungicides were tried.

Results were no better — the crop still failed.

Numerous samples of prothalli were tested by laboratories around Australia who constantly diagnosed: “no diseases or no pests — it must be an environmental problem”.

Suddenly at the end of 1984 most of the prothalli in our trials stopped degenerating and grew beautifully, irrespective of media, light, temperature, etc. The only failures were in the widest ranges of the trials.

It should be noted that prior to 1984 we were producing over 100,000 tree ferns a month from spores, covering a range of about thirty different cultivars, and there were no problems of degenerating prothalli.

By the end of March, 1985, after three months of successful production, most of our grower customers had cancelled their orders because their own production was now “doing nicely”. This is being written in May, 1985, and there are tree ferns everywhere.

Our nursery has produced many millions of ferns from spores and we have been very conscious that many cultivars can be destroyed by a single factor being out of line, at any time.

It is my considered opinion that the minute, delicate *Cyathea cooperi* spores which are responsive to the most minute of variations in the complex balance of environment, media, and nutrients have, during this period of 1984, been indicating to us in a very real way, a change in the earth's total environmental balance. We do not know what changed — perhaps radiation, atmospheric gases, or a host of factors, but we do know that something did happen, and the tree fern spores in their own way told us about it.

Incidentally, we have since sown more of each batch of spores collected around Australia in 1984, and they have all grown successfully, with only normal losses.