

A/Prof David Leung

Plant Tissue Culture Research

@School of Biological Sciences



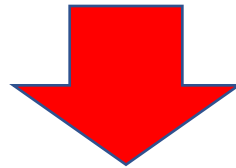
Plant tissue culture: A vegetative propagation technology

genetic improvement research
(after growth-strain measurement, insect or disease resistant, cold resistant.....)



Mass cloning (selected eucalypts)

(Plant tissue culture or other vegetative propagation methods)

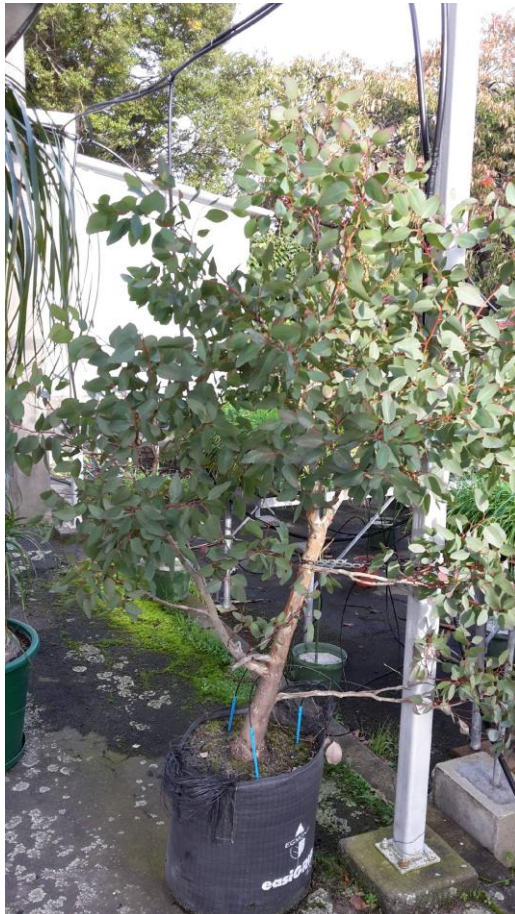


True-to-type propagules for growing on

Agriculture / Horticulture / Forestry



Propagation:
Nurseries,
Greenhouses



Plant tissue culture

(micropropagation)



**Free of
insects,
Diseases**



No threat from adverse natural climatic conditions
(water stress, strong wind, temperature stress, etc.)

David Leung's Research@ UC
Since 2016

PROBLEM:

No method

to tissue culture (micropropagate)
selected eucalypts of interest to NZDFI

Eucalyptus bosistoana

Micropropagation of *Eucalyptus bosistoana* : the most critical step



Eucalyptus bosistoana: Tissue Culture @ UC

No problem with
establishing **clean**
culture

Media tested for
shoot development
in vitro **OK** [could
be fine-tuned, if
needed]



Next?

Multiple New Shoot Buds (*Eucalyptus bosistoana*)



New shoots at multiple positions



Further research:

Media tested for shoot development *in vitro* **OK** [could be fine-tuned or adapted for other Eucalyptus species or genotypes, if required]

Individual shoots isolated and rooted



Growing on in soil?



The number game...Maths!!!

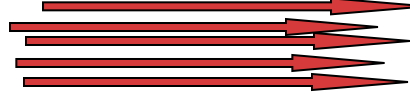


One
shoot
cutting



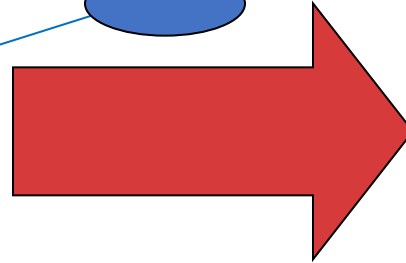
One jar (multiple shoots at multiple locations)

20 shoot
cuttings



20 jars

**400 shoot
cuttings**



?? jars

**Additional
Unique advantages of
Micropropagation:**

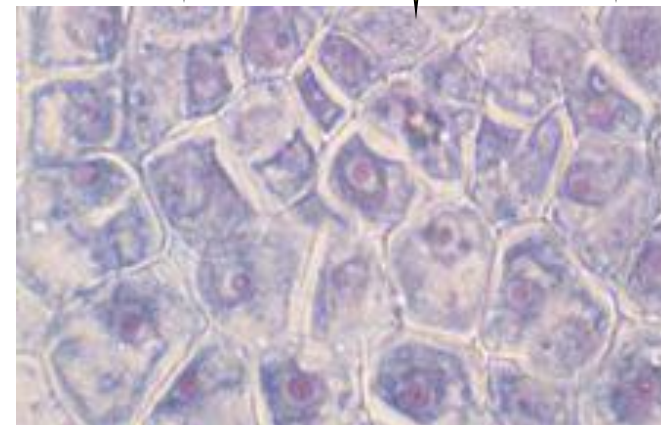
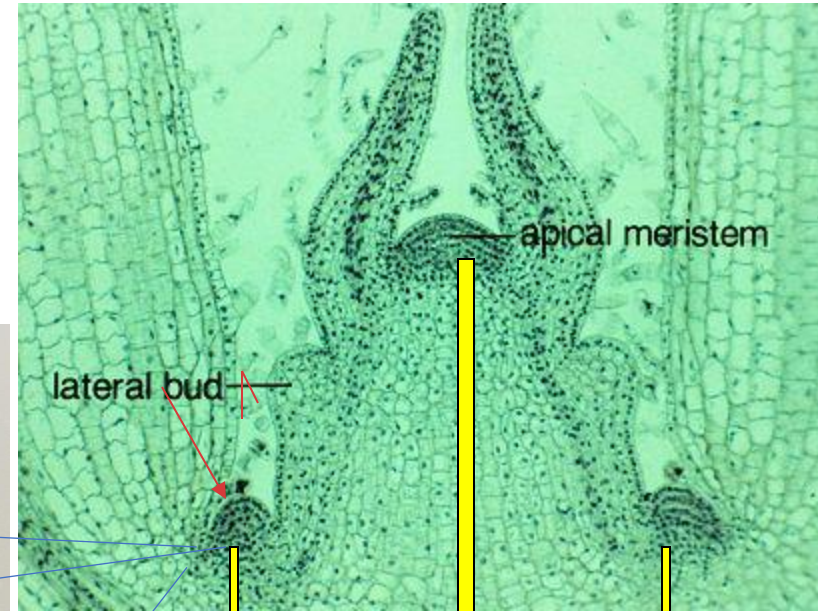
Year-round (even in winter months)
continuous cyclic plant cloning

High-health

Multiple cyclic rounds of multiplication at an ever-explosive pace

Efficiency="Mind-Boggling" Multiplication?!!!!

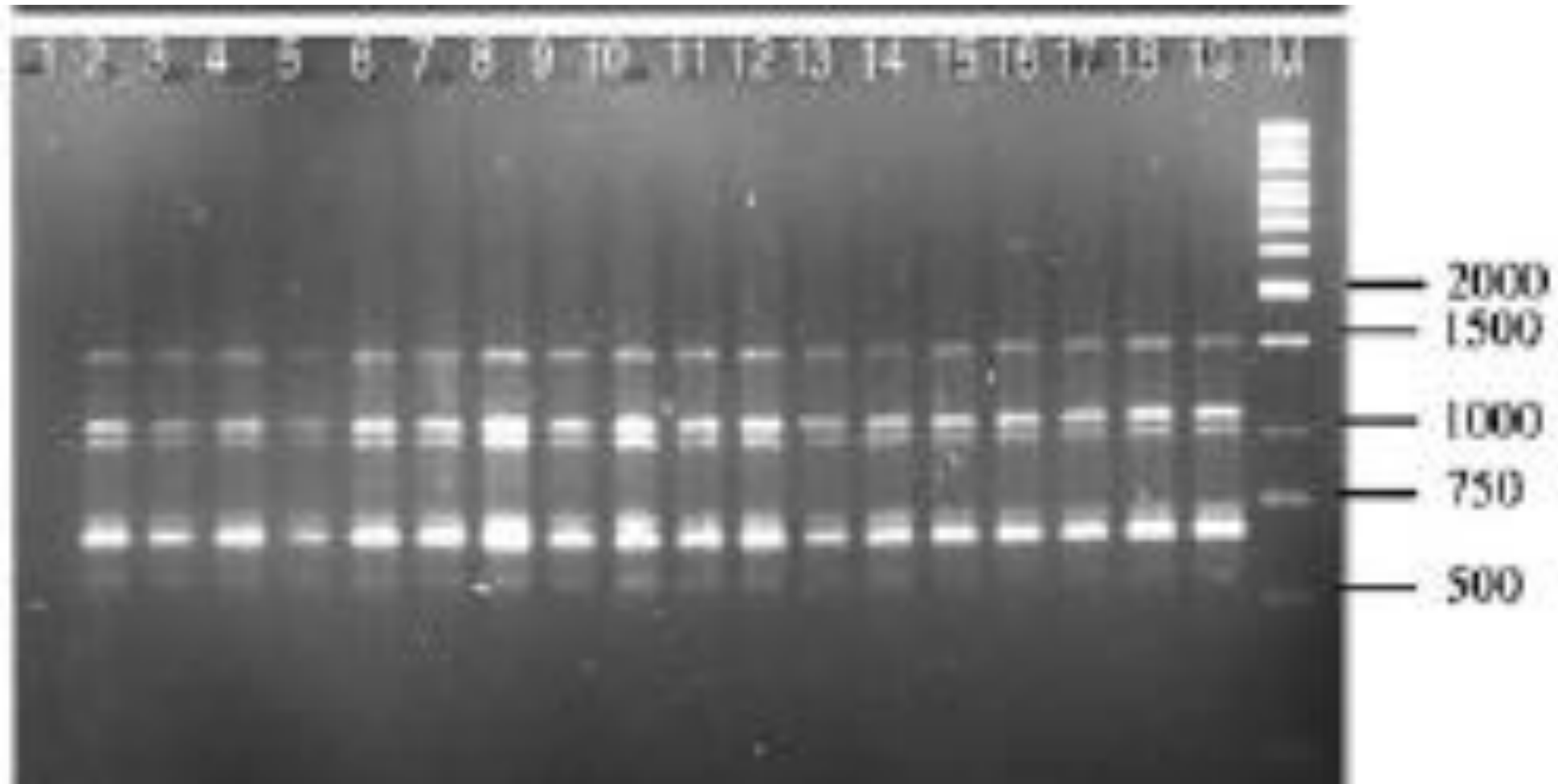
True-to-type



STEM CELLS

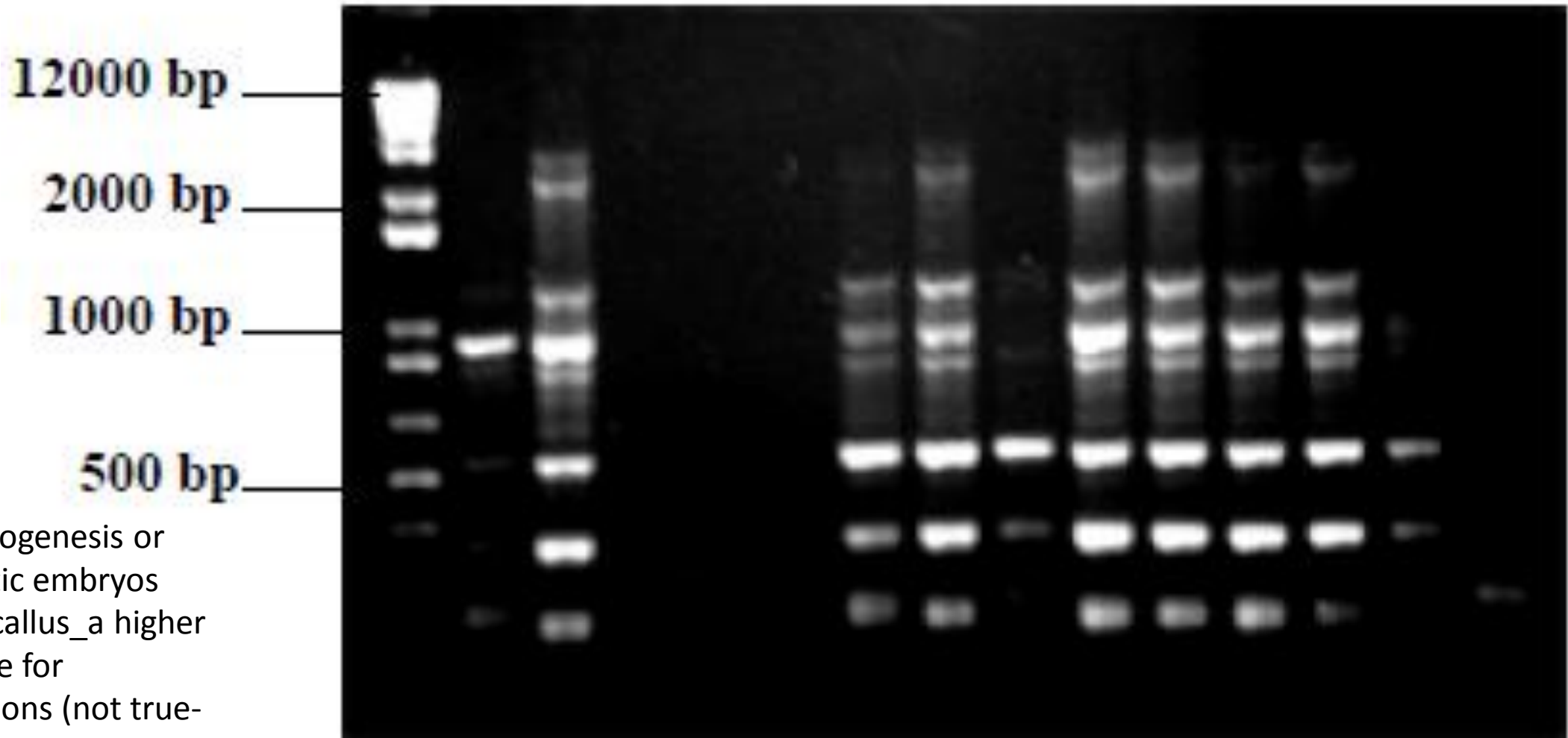
Quality / Identity Assurance

DNA fingerprinting profiles:
true-to type propagues _same “bar code”



Genetic variations_different DNA fingerprints

M C 1 2 3 4 5 6 7 8 9 10 11 12 N



Organogenesis or somatic embryos from callus_a higher chance for variations (not true-to-type)