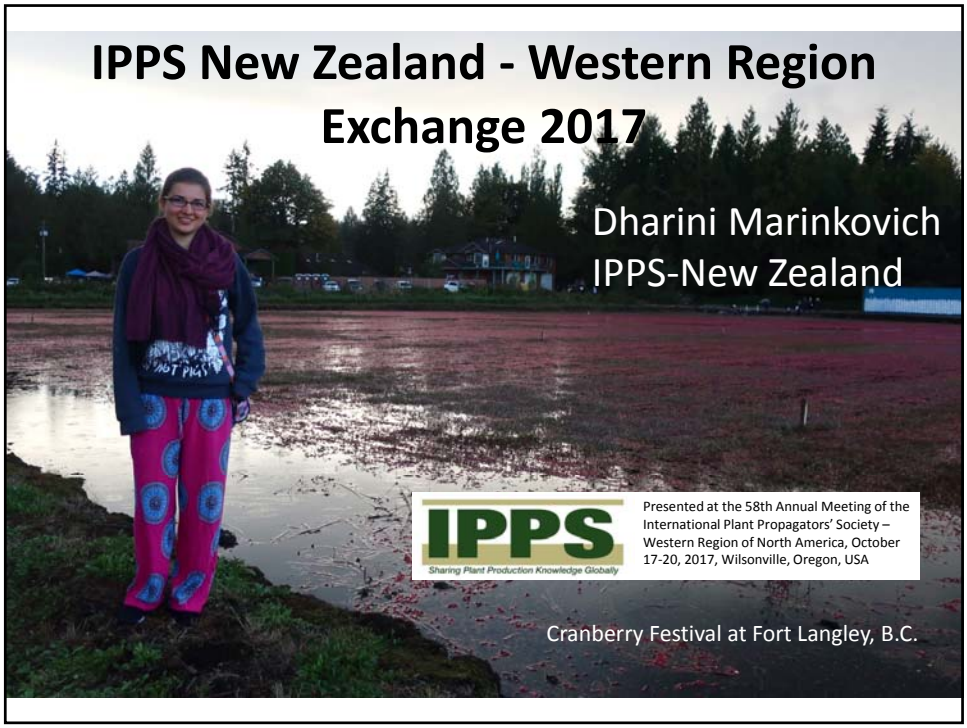

IPPS New Zealand - Western Region Exchange 2017
Dharini Marinkovich
IPPS-New Zealand
IPPS
Sharing Plant Production Knowledge Globally
Presented at the 58th Annual Meeting of the International Plant Propagators' Society – Western Region of North America, October 17-20, 2017, Wilsonville, Oregon, USA
Cranberry Festival at Fort Langley, B.C.


With my host, Valerie Sikkema from Van Belle Nursery, learning about cedar trunks in Lynn Canyon.

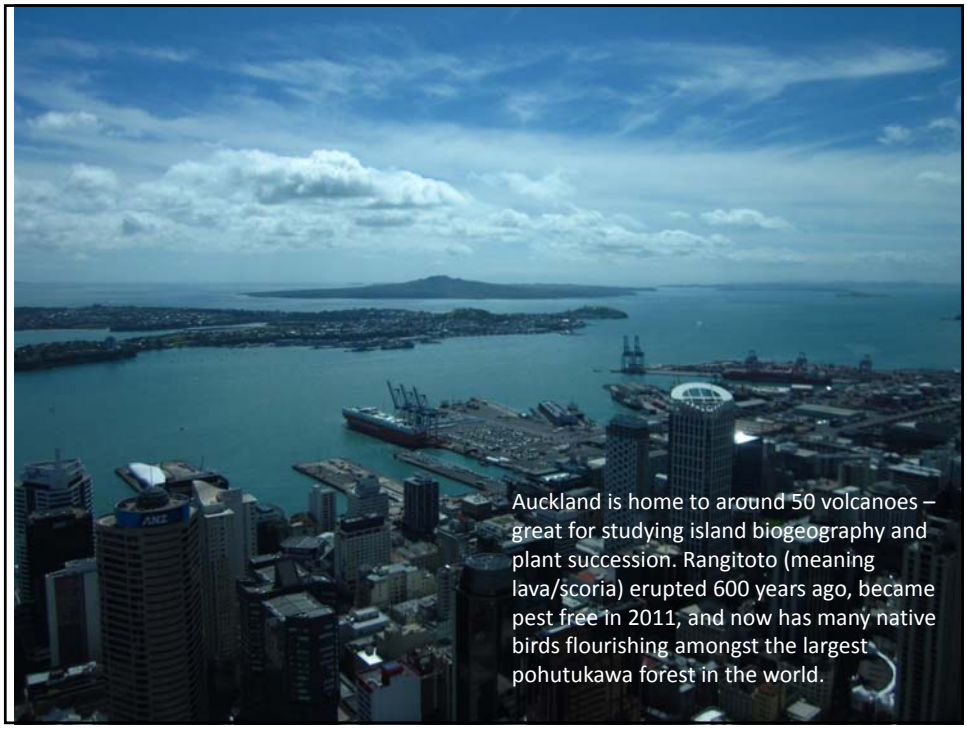
Japanese Tea Garden at University of British Columbia

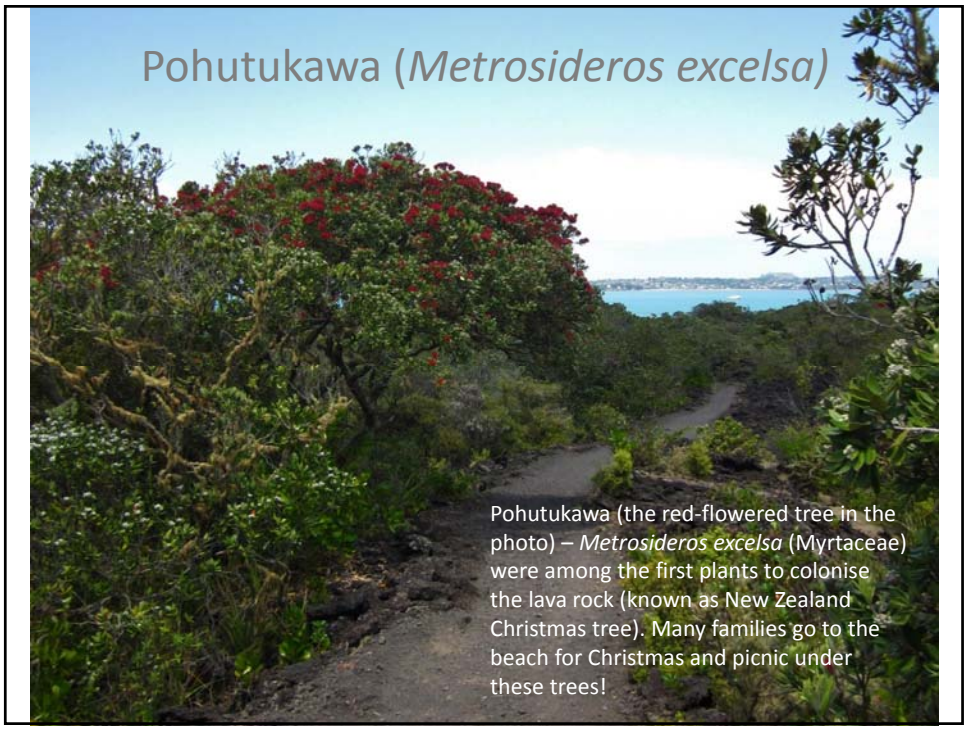
Qualitree Nursery B.C.,
Gaultheria procumbens

Van Belle Nursery, B.C, and their new brand Bloomin' Easy.

I grew up and live in Auckland, New Zealand.

Most Aucklanders live within a short drive to the ocean as the city sits between two harbours.


Auckland is home to around 50 volcanoes – great for studying island biogeography and plant succession. Rangitoto (meaning lava/scoria) erupted 600 years ago, became pest free in 2011, and now has many native birds flourishing amongst the largest pohutukawa forest in the world.

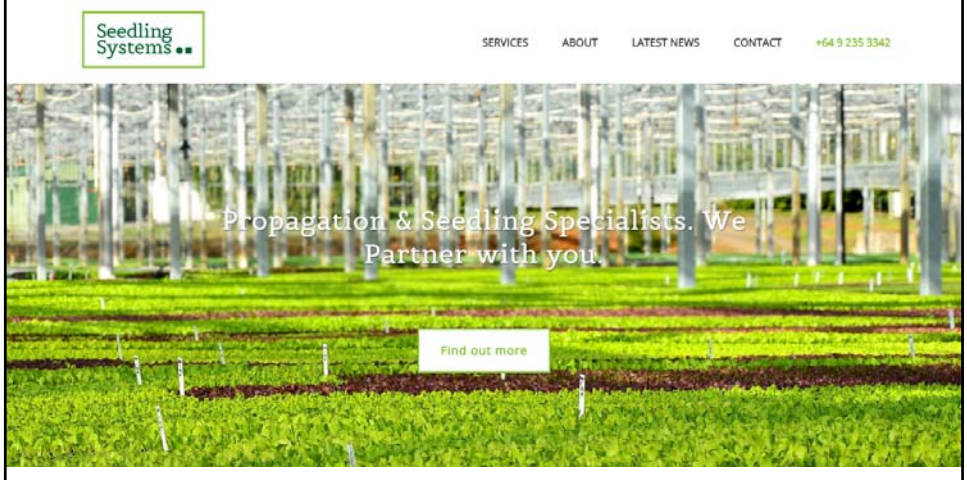

Pohutukawa (*Metrosideros excelsa)*
Pohutukawa (the red-flowered tree in the photo) – *Metrosideros excelsa* (Myrtaceae) were among the first plants to colonise the lava rock (known as New Zealand Christmas tree). Many families go to the beach for Christmas and picnic under these trees!

A. *Investigating the effect of abiotic stress and natural variation on flowering and productivity in the model legume Medicago truncatula.*

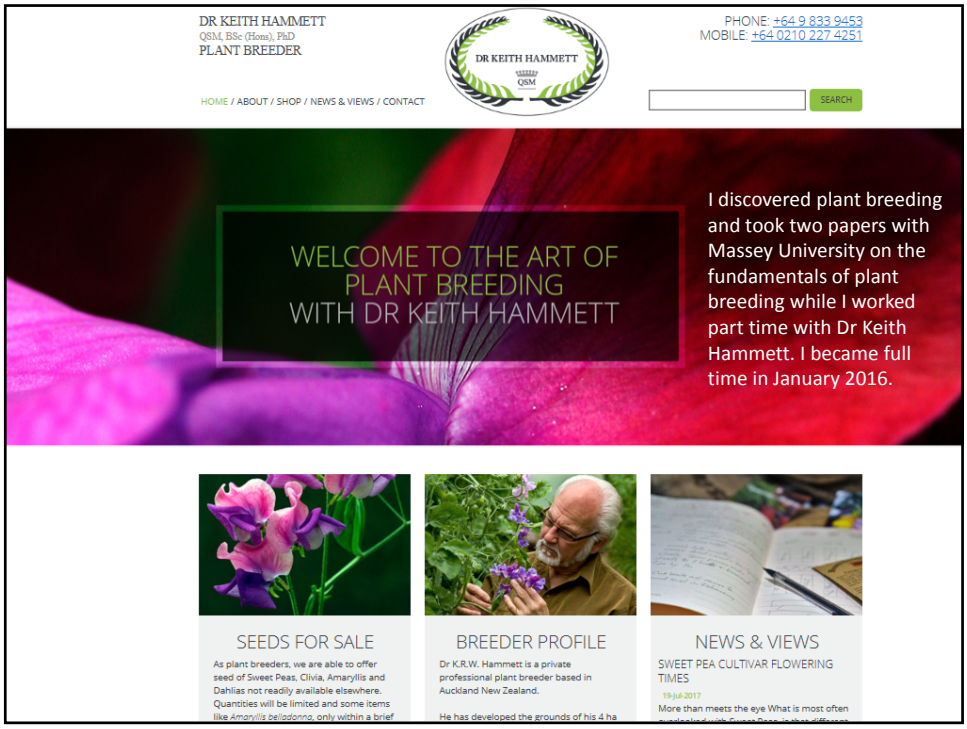
B. *Genotyping transgenic Arabidopsis seeds for the Medicago gene MtPIM.*

Student:	**Dharini Marinkovich**
Supervisor:	**Joanna Putterill**
Host Unit:	**University of Auckland School of Biological Sciences**
Degree:	**BSc/BA in Biological Sciences and Classical Studies**

I attended the University of Auckland and chose to study Biology and Classical studies, because I couldn't decide between science or arts. This lead me to a summer studentship in my final year studying nutritional influences on flowering time of the model legume *Medicago truncatula*. I enjoyed the practical aspects of it which helped me realise that I wanted to head in a more applied science direction rather than pure research.



I spent 6 months at Seedling Systems, the largest propagation nursery in South Auckland. As well as hand-sowing they have an Urbinati Zeta Compact sowing line that can sow all pelleted seed, multiple seeds per cell and up to 650 trays an hour. My then boss introduced me to Antony Toledo of Multiflora tissue culture, who talked to me about horticultural careers and IPPS! I joined up straight away and enjoyed my first IPPS field trip to Tauranga.



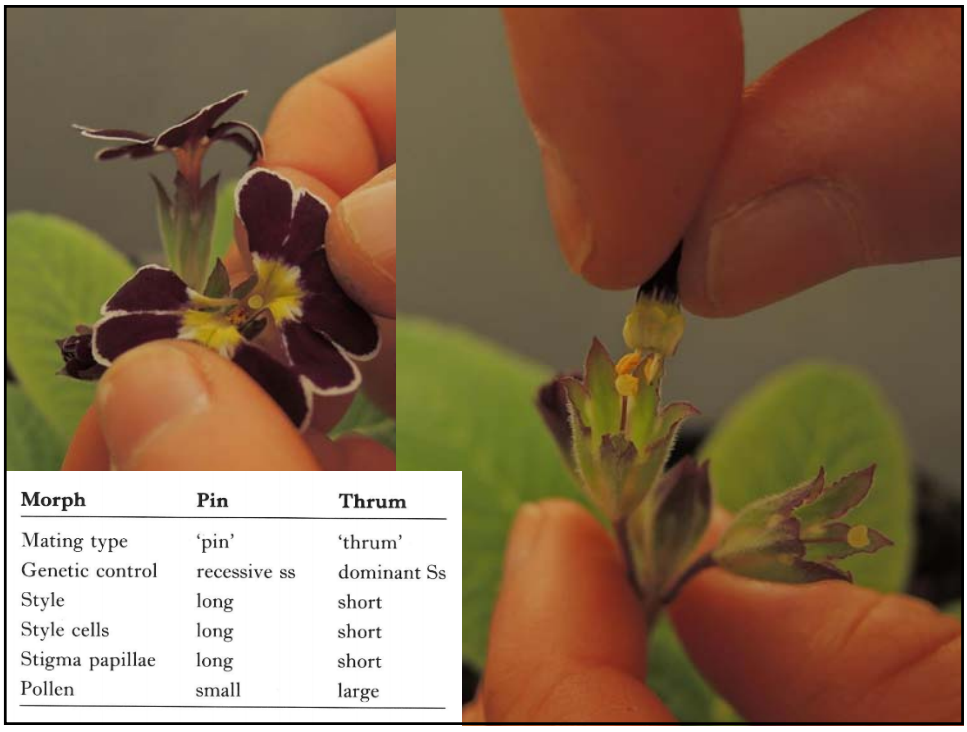
I discovered plant breeding and took two papers with Massey University on the fundamentals of plant breeding while I worked part time with Dr Keith Hammett. I became full time in January 2016.


Botanical Science
Taxonomy
Breeder
Marketer
Production Nurseries
Retail
Consumers
Plant breeders sit in a network of people in the plant propagation industry. We rely on taxonomists and botanical science to understand the breeding system and breeding possibilities of the total germplasm and specific species we deal with.
Once we have a new cultivar, it needs to be made available to fellow plant lovers, this requires growers, marketers, and retailers.


Vision + Inspiration
Goal
Strategy
Method

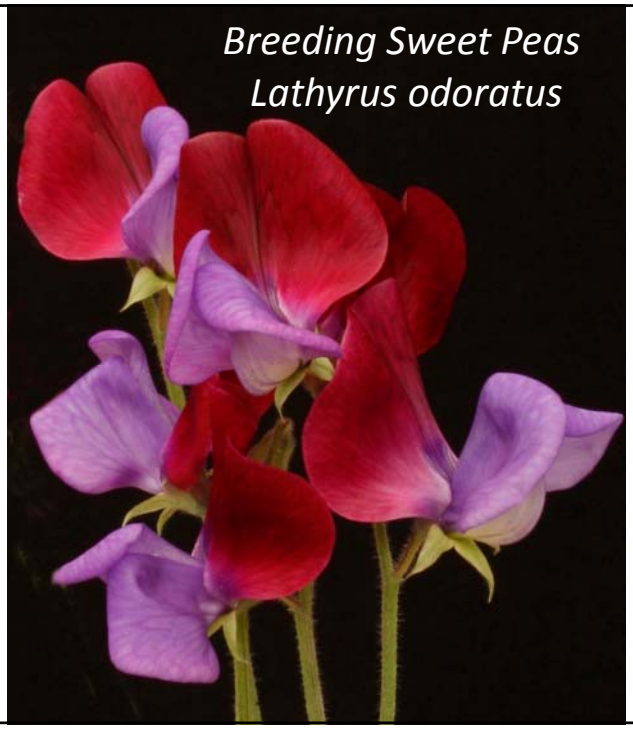
- Vision + Inspiration
- Goal
- Strategy
- Method

Polyanthus are outbreeders with two mechanisms of self incompatibility: one is spatial separation of anther and stigma (heterostyly): pin form (left) has the stigma raised above the anthers, thrum form has anthers raised visible above the stigma (right).



Morph	Pin	Thrum
Mating type	'pin'	'thrum'
Genetic control	recessive ss	dominant Ss
Style	long	short
Style cells	long	short
Stigma papillae	long	short
Pollen	small	large


Outcome



- Dawn Edwards, The Plantsman, December 2014.


Challenges: Embryo abortion, seedling abortion
(weak chlorotic plants fail to mature)
Methods: Embryo rescue and in vitro culture

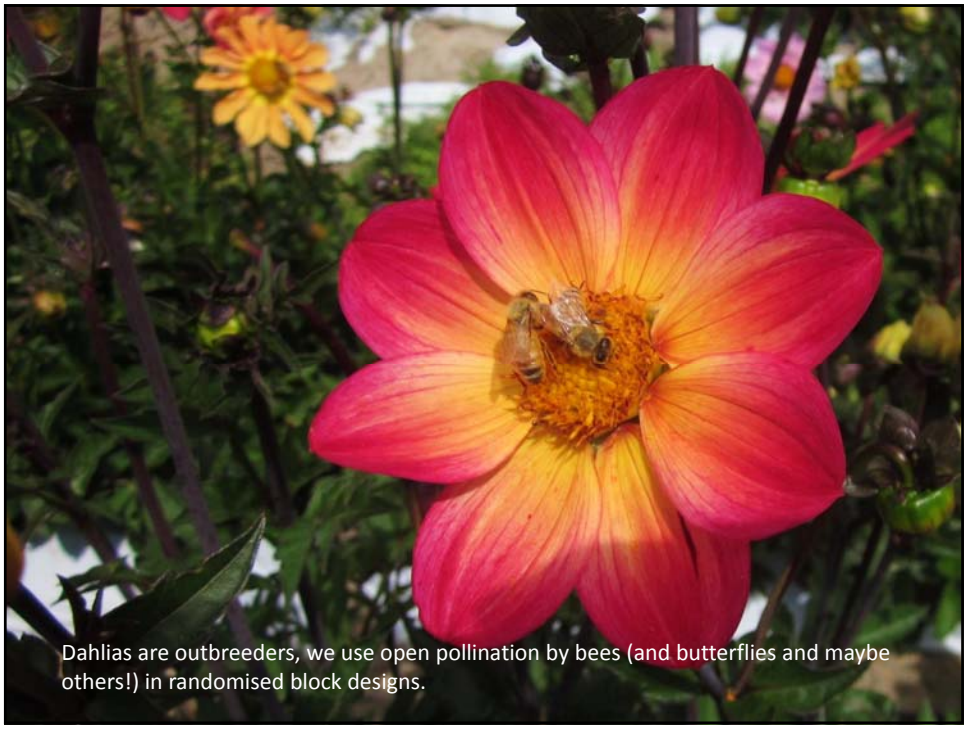

Other consequential results: Backcrossing the F1 hybrids to other
Lathyrus odoratus cultivars produced a range of new commercial
cultivars with new colour combinations never seen before.


Contributions?
Challenges?
Phenotype = Genotype (nature)
+ Environment (nurture)


Are we finished yet?


Breeding Dahlias
Vision + Inspiration
Goal
Strategy
Method


The variety of foliage in dahlia species as seen in their natural habitats in Mexico inspired my boss to breed for foliage in dahlias for garden plants (something that dahlia exhibitors do not care for on the show bench). We now have a wide variety of foliage types and also shades from bright green to dark black.


Dahlias are outbreeders, we use open pollination by bees (and butterflies and maybe others!) in randomised block designs.


When you move away from show standards/confines, anything is possible!

Size differences as well as disc colour, ray and collar colour, and floret shape.

	Standard Bicolour		Self		Reverse Bicolour	
	Yellow Disc	Dark Disc	Yellow Disc	Dark Disc	Yellow Disc	Dark Disc
Green Leaf Tall Entire	1	2	3	4	5	6
Green Leaf Tall Divided	7	8	9	10	11	12
Green Leaf Intermediate Entire	13	14	15	16	17	18
Green Leaf Intermediate Divided	19	20	21	22	23	24
Green Leaf Dwarf Entire	25	26	27	28	29	30
Green Leaf Dwarf Divided	31	32	33	34	35	36

	Standard Bicolour		Self		Reverse Bicolour	
	Yellow Disc	Dark Disc	Yellow Disc	Dark Disc	Yellow Disc	Dark Disc
Dark Leaf Tall Entire	37	38	39	40	41	42
Dark Leaf Tall Divided	43	44	45	46	47	48
Dark Leaf Intermediate Entire	49	50	51	52	53	54
Dark Leaf Intermediate Divided	55	56	57	58	59	60
Dark Leaf Dwarf Entire	61	62	63	64	65	66
Dark Leaf Dwarf Divided	67	68	69	70	71	72


Contributions?
Challenges?


Thank you for listening!

References

- www.drkeithhammett.co.nz
- Edwards, Dawn. *The Plantsman*, December 2014.
- Richards, John. *Primula*. B.T. Batsford Ltd., London, 1993, pp 46 – 47.
- www.americanprimrosesociety.org