

# new zealand gardener

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WIN 1 OF 6 VEGE PODS!

## 100 TIPS FOR BETTER VEGES

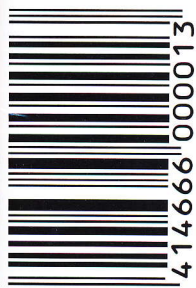
Getting started,  
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### WE VISIT

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plant lovers  
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### Inside

- Can you have a plastic-free garden?
- The gender politics of lawn care



stuff

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**SCIENCE**  
OF SWEET PEA  
BREEDING

**BEAT**  
ROSE  
PESTS

**BUILD**  
A SELF-WATERING  
PLANTER BOX

**MAKE**  
ELDERFLOWER  
GIN & TONIC

**HERBS**  
TO HELP  
HAY FEVER



PLANTS

Dr Keith Hammett  
and Larry amongst  
the sweet peas.







# Sweet on sweet peas

Thanks to the work of Dr Keith Hammett,  
New Zealand is the centre of the world when  
it comes to the development of this fragrant bloom.

STORY: JACK HOBBS PHOTOS: JASON DORDAY/STUFF



**K**iwis love to celebrate international success, especially in rugby and other sports. I reckon

Dr Keith Hammett deserves similar accolades for his world-leading plant breeding exploits.

Recognition certainly came his way in 2013 when one of his sweet peas was chosen as the flower to represent the centenary of the Chelsea Flower Show. The Royal Horticultural Society (RHS) selected one of his strains from trials held at Wisley Garden and named it 'Chelsea Centenary', undoubtedly one of the greatest horticultural honours bestowed on a Kiwi.


Keith regards plant breeding as an art form, his motivation the same as that of a composer or painter. He begins by visualising his objective, and then he formulates a plan as would be expected of a scientist. His inspiration comes from his love of the plant and his belief that it can be improved. Financial reward is a secondary benefit.

Sweet peas have been worked on by generations of breeders; Keith compares himself to a competitor in a relay race who runs a leg then passes the baton on. He feels fortunate to have Dharini Marinkovich working with him to continue his work if he "drops dead". Although still in her 20s, Dharini has developed a close understanding of the breeding operation after two years working with Keith.

Keith initially set out to breed sweet peas with bicoloured flowers, as these had largely disappeared because judging criteria in sweet pea shows dictated that only strains with flowers of one colour (known as selfs) won prizes. Exhibiting







Some of the new  
colours now available  
in sweet peas.



The flower on the left is close to the original colours of wild sweet pea. The flower in the middle has had the blue gene 'turned off'. The flower on the right has had blue and red genes 'turned off' to produce white blooms.





had become a competitive sport with arbitrary rules resulting in the demise of bicolours, so Keith set out to rectify this.

The development of selfs had been, in fact, some achievement as the original wild sweet pea was a bicolour, as was the very first cultivar 'Painted Lady'.

For his breeding programme, Keith returned to the ancestral 'Grandiflora' strains that are both bicoloured and strongly fragrant. Their exquisite fragrance has been inherited by strains such as 'High Scent' and 'High Society' which are the most popular varieties in the Hammett range today.

Although his goal of bicoloured sweet peas was achieved, Keith was still not satisfied with the result. He figured this was because their colour intensity was the wrong way round – the wings, which are the closest part of the flower when viewed, being paler than the standards. Keith explains that in a landscape, the closest mountain is darker and more defined than the furthest mountains that fade into the distance. So Keith set out to develop reverse bicolours with wings darker than the standards.

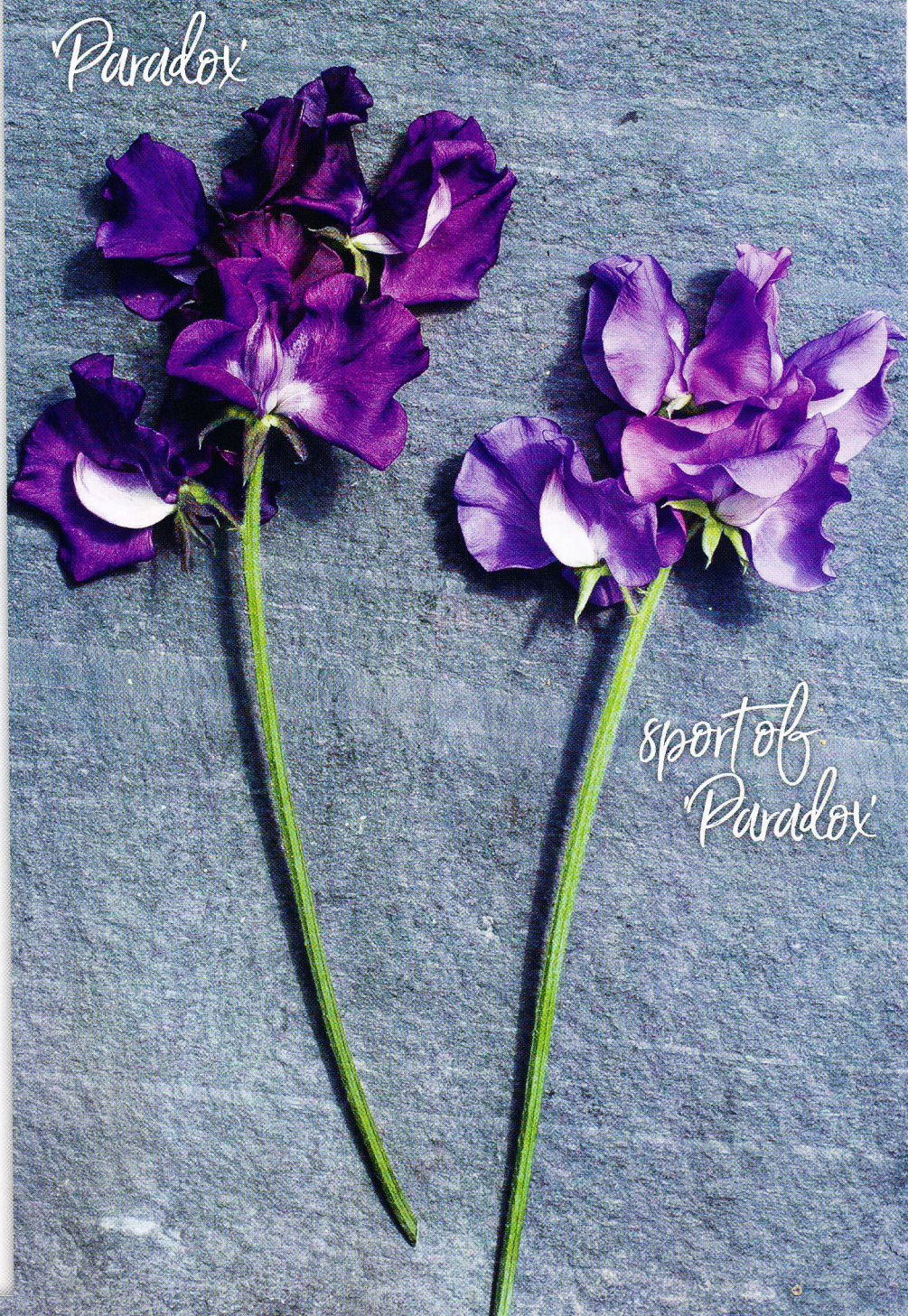
It took 20 years to produce reverse bicolours 'Leading Light' and 'Blue Mountain', but still, their colour contrast was not yet sufficiently distinct.

Keith sought a breakthrough, but his challenge lay in working with a crop that, in more than 300 years, was based entirely on subtle variations within just one self-pollinating species, *Lathyrus odoratus*.

To put this into historical context, it had taken breeders a century to produce the first six cultivars, and it was only by the end of the 19th century that breeders had sufficient varieties to produce the slightly larger-flowered 'Grandiflora' types.

The single most important breakthrough in sweet pea history happened in 1900, when a seedling with large flowers and

Many sweet pea breakthroughs have come via natural mutations – aka sports – where a seedling offers a desirable new quality (like the paler blue sport of 'Paradox' below).





On the left and right are two parent plants. In the centre is the cross, the F1 offspring or Filial 1 (literally "first child"). It will be self-pollinated to create the next generation.



*parent*



*parent*



*offspring*



wavy petals occurred at Althorp Park in Britain, the ancestral home of Lady Diana. The large, frilly flowers of 'Spencer' sweet peas caught public imagination despite being less fragrant than 'Grandiflora' types.

The next major breakthrough occurred almost a century later. It began when Keith noticed his old university in Southampton, England had the red and yellow-flowered *Lathyrus belinensis*. He asked his friend Brian Murray to visit and ask for seed, and fortunately the personal approach worked. This attractive species has yellow wings and paler standards with red veins, and surprisingly, was not discovered until the 1980s when found in a remote part of Turkey.

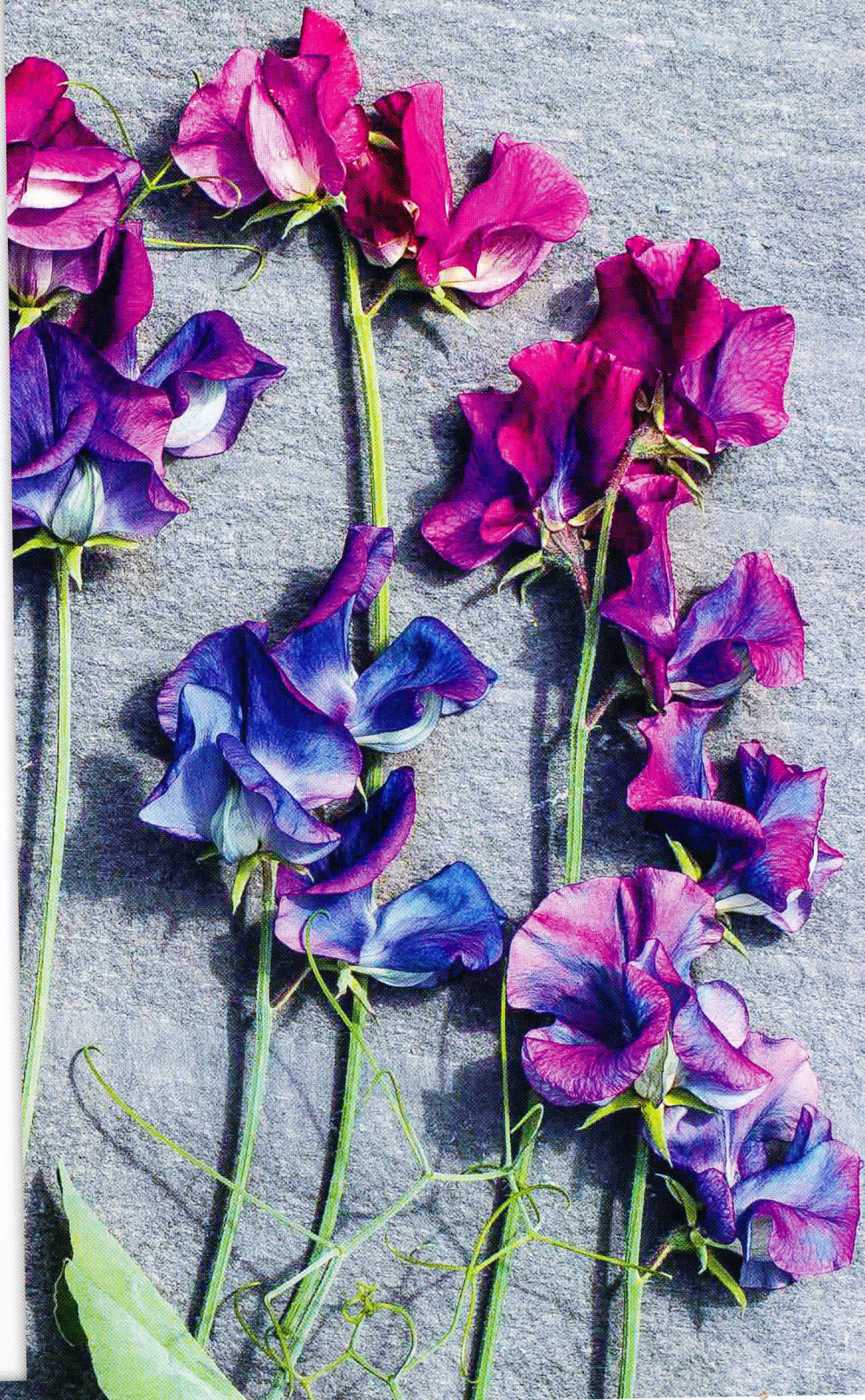
Keith crossed *Lathyrus belinensis* with sweet peas (*Lathyrus odoratus*), eventually producing a new hybrid strain now known as *Lathyrus x hammettii*. This introduction of new genetic material has led to the greatest breakthrough in sweet peas breeding since the advent of 'Spencer' types.

Frustratingly, the early crosses were unsuccessful as embryos withered and died, but finally one weak seedling survived when reared in a laboratory. Fortunately it produced sufficient pollen to be put onto both *Lathyrus belinensis* and *Lathyrus odoratus* flowers, with the latter cross producing the more robust offspring.

Another of Keith's main objectives was to produce yellow sweet peas, something yet to be achieved. However, other fascinating offspring have emerged, one of the most unexpected being "morphing", where the colours change in hue as flowers mature. 'Blue Shift' is an example of this novel effect, with flowers shifting with age from mauve to blue and ultramarine hues not previously seen. 'Turquoise Lagoon' is a paler version that also shifts over time.

Another benefit of introducing *Lathyrus belinensis* into sweet pea breeding is an intensification

Morphing is where colours change in hue as flowers mature. 'Blue Shift', pictured here, is an example of this novel effect, with flowers shifting with age from mauve to blue and ultramarine hues not previously seen.





## SWEET PEA NOTES

- **Most available sweet peas** are summer flowering, requiring 12 hours of daylight before they will bloom. Keith advises these are best planted any time between July and October, certainly not before June or the vines grow too large by the time days are long enough for flowering to commence. Removing the main shoot from young plants encourages stronger basal growth and bushier plants.

- **Spring-flowering types** require 11 hours of daylight and are best sown in May, and winter-flowering varieties need just 10 hours and are best sown late February or March. These typically produce a single main stem without strong basal growth and are mainly grown as cut flowers.

- **Dharini emphasises** the importance of protecting young seedlings from slugs and snails.

- **Cultural notes are sent out** with seeds. Order from Keith's website, [drkeithhammett.co.nz](http://drkeithhammett.co.nz).

On the left and right are *Lathyrus belinensis*, which Keith Hammett crossed with *Lathyrus odoratus*, aka sweet peas, to produce *Lathyrus x hammettii*. In the centre is the wild pea, *Pisum elatius*, which is what inspired him to pursue reverse bicoloured sweet peas.





of the colour contrast in reverse bicolour strains. This is most evident in 'Erewhon' which has the greatest colour contrast of any of Keith's reverse bicolours though it's not perfectly shaped – someone once describing it as looking "like a bat flying out of a sunset".


'Somewhere' is a more recent development with slightly less contrast but the flowers are larger and of better shape. 'Maloy' is the first bicolour with pinkish blooms, a popular complement to the bluish flowers of 'Erewhon'.

Keith takes great delight when others report new variations occurring from seed that he has provided. Recently, he was contacted by an overseas grower who had raised 'Turquoise Lagoon' seedlings that included one plant with intense blue flowers rather than the initial pink. Seed saved from this plant have produced offspring that produce sky blue flowers maturing to an almost "surreal tropical blue". The lesson is to watch out for plants that vary from the norm; they are more common than you think and can lead to extraordinary new developments.


The introduction of new genetic material into sweet pea breeding has opened new opportunities not previously considered possible. Although yellow flowers remain elusive, the quest continues, with Dharini making numerous crosses with *Lathyrus belinensis* last year. This is despite knowing that her time and considerable effort will mostly produce weak seedlings that will wither and die. Keith never gives up though – an essential attribute of any plant breeder.

Even if a yellow sweet pea does not emerge, the introduction of a species with yellow flowers has already transformed the colour range of sweet peas.

Keith believes a "cascade of other colours" is possible. For him, it is motivation enough to continue pursuing the art of plant breeding. ❀



Not all siblings are alike! Both of these flowers resulted from a cross between 'Earl Grey' and 'Nimbus'.



'Back mutation' can occur when traits from previous generations re-emerge – below on the left the tendrils have 'turned back' into leaflets with the acacia leaf form.