



# SOILLESS AUSTRALIA

Official Newsletter of the Australian Protected Cropping Industry  
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**Bumblebee  
Campaign**



# Bumblebee Campaign

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### Front Cover:

In this photo, PCA Chairman Marcus Brandsema is seen pollinating his commercial crop of cherry tomatoes with a hand-held vibrating wand.

Marcus, like many PCA members, is at a huge disadvantage without equal access to the internationally acclaimed *Bombus Terrestris* (Bt) bumblebees to pollinate efficiently and naturally.

Australian growers are begging the PCA to help with political support for a Bt bumblebee trial in Tasmania.

For 20 years they have been buzzing in Tasmanian gardens to no alarm, yet it is illegal to use them in commercial greenhouse crops.

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Australian tomato, capsicum, eggplant and berry growers keep telling the PCA that they want *Bombus terrestris* (Bt) bumblebees to pollinate their crop. They want to be on a level playing field with other greenhouse growers around the world.

Back in 2008, the then Minister For the Environment Peter Garrett rejected our application to import Bt bees onto the Australian mainland. Feedback suggested we won the case on scientific grounds, but ultimately had not yet won political support.

PCA Chairman Marcus Brandsema grows cherry tomatoes in Tasmania, where Bt bees have been endemic in the wild for over 20 years. They buzz around his garden to no known ill-effect, but he is not permitted to use them inside his greenhouse.

Originally the exotic Bt bees in Tasmania probably hitchhiked from New Zealand in cargo. It may come down to a matter of a point of law about exactly how the bees were initially introduced.

The Federal Minister for the Environment, The Honourable Greg Hunt MP is being asked from all sides to reconsider the current prohibitions on possession and use of Tasmanian Bt bees under the Environment Protection and Biodiversity Conservation (EPBC) Act. They say that the Act does not apply in the specific context of Bt bees already in Tasmania, for commercial pollination purposes locally in Tasmania.

Currently labelled a pest species, there are restrictions under the EPBC Act that says the possession of illegally imported specimens and the progeny of such specimens is prohibited.

So commercial greenhouse growers cannot use Bt bees on their tomatoes, and must resort to a hand held vibrating wand to each flower to set fruit. This is expensive and inferior to Bt pollination and puts our industry at an economic disadvantage in a global market.

Like many others, the PCA struggles to understand why the Tasmanian growers cannot use Bt bees when they are already there, with no demonstrated ill-effect, and yet can be used to boost yield and fruit set.



**Bt bees dislodge and spread pollen by buzz pollination or sonication. They grab onto the flower and vibrate their flight muscles rapidly, and most efficiently for fruit set**

Following below is a detailed report by the Costa Group who produce more than 11 million kilos of premium truss tomatoes per annum. It was part of their submission to the 'Inquiry into the future of beekeeping and pollination industries in Australia' in February.

A collection of letters on page 10-11 of this magazine shows more support (from both sides of politics) to begin a Bt bee trial in a commercial glasshouse in Tasmania.

Therefore, due to overwhelming demand from industry, the PCA is seeking clearance for the already present Bt bees found in Tasmania to be commercially reared and utilised for pollination purposes. PCA Chairman Marcus Brandsema is offering his glasshouse as a trial site.

Make your voice known to PCA and we can represent you to the authorities.

*Excerpt from Costa's Submission to the Senate Rural & Regional Affairs & Transport Reference Committee Bee Keeping Enquiry.*



## Pollination Of Glasshouse Crops

Fresh produce retailers (ie. Coles, Woolworths et al) are increasingly requiring quality-guaranteed, year-round supply. This is also the case in other countries and Australia's aspiration to be the food bowl of Asia will be influenced by our ability to meet these requirements.

The efficient and effective pollination of glasshouse tomato plants is crucial to the year round production.

Tomatoes belong to a unique class of fruits (and vegetables) that require 'buzz' pollination. Known scientifically as sonication, buzz pollination is the technique used by some bees to release pollen which is more firmly held by the male sexual part of the flower the anther, to make pollination more efficient.

The most efficient pollination is accomplished by a few species that specialise in buzz pollination. Whilst the use of native bees has been researched, there remains only one serious contender for this job namely the bumblebee.





In order to release the pollen, bumblebees and some species of solitary bees are able to grab onto the flower and move their flight muscles rapidly, causing the flower and anthers to vibrate, dislodging pollen. Honeybees do not pollinate flowers by this method.

In glasshouse grown crops where wind is not available, bumblebees add to the considerable yield and sustainability advantage over field-produced crops.

Commercial glasshouse tomato growers in New Zealand claim that using bumblebees as pollinators results in a superior quality tomato and about a third more fruit set than other methods of pollination.

In a glasshouse tomato crop, a single bumblebee had the ability to pollinate 450 flowers per hour.

Bumblebees in the crop mean that pesticides use has to be greatly reduced in favour of biological pest management, resulting in improved safety for Australian consumers and crop workers. It also creates a 'clean and green' marketing advantage as used to sell produce in Europe.

Bumblebees enhance the quality and yield of other crops relevant to Australian growers. Crops for which bumblebees are used overseas include fruit crops (almond, apple, apricot, black currant, blackberry, cherry, cranberry, gooseberry, peach, pear, plum, red currant, strawberries,

blueberries, kiwifruit), vegetable crops (courgettes, cucumber, eggplant, melon, tomato) and seed crops (cabbage, carrot, cucumber).

Unfortunately the possession and use of bumblebees is prohibited in Australia because of limitations with the Commonwealth Environment Protection and Biodiversity Conservation Act (EPBC) 1999 Act, and bureaucratic misunderstanding of the intent of the Act.

As a (poor) substitute Australian tomato glasshouse producers must use a vibrating wand which is used by tapping each tomato plant to ensure pollination. Manual pollination is an additional production cost of \$3 million annually because of its inefficiency, but is not an impediment to Costa's international competitors where bumblebees are used. Consequently the prohibition on the use and importation of bumblebees places otherwise highly efficient glasshouse fruit and vegetable producers in Australia at a competitive disadvantage.

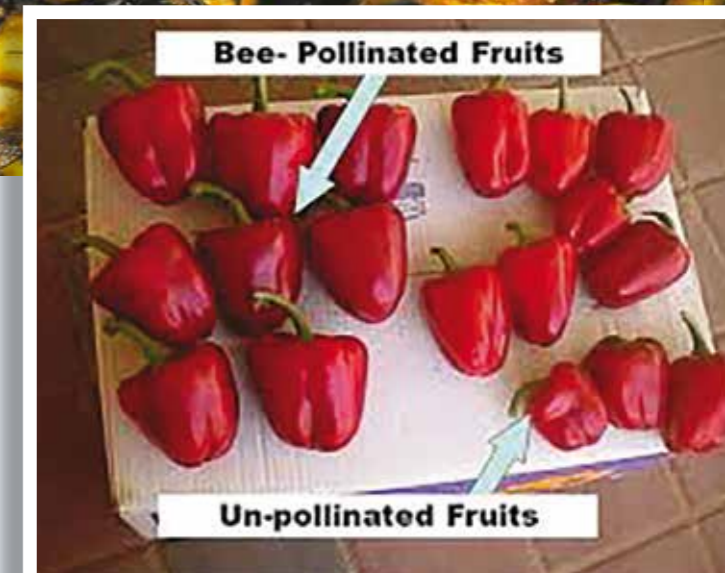
Because of the desire of both Liberal and Labor governments to enter into free trade agreements (the most recent being South Korea), and the strong probability at least some of these agreements (e.g China) would be with other glasshouse fruit and vegetable producers, the competitive disadvantage to Australia is an important and growing issue.

### Current Prohibition On Bumblebees

Although bumblebees have been present in the Tasmanian wild since 1993, the use of bumblebees to pollinate glasshouse crops in both Tasmania and on the Australian mainland is deemed to be prohibited under the Commonwealth Environment Protection and Biodiversity Conservation Act (EPBC) 1999.

In October 2008 the then Environment Minister Peter Garrett rejected an application by the Australian Hydroponic and Greenhouse Association (AHGA now PCA) requesting the Minister approve the importation, and use of bumblebees for pollination purposes in commercial glasshouses. The Minister's decision was based on the following reasons:

- Bumblebees brought into Australia for crop pollination in greenhouses could have posed a serious risk to the Australian environment, native bee populations and native bird species.
- The scientific evidence and advice suggested that the environmental and economic risks of a large earth bumblebee population spreading throughout mainland Australia were significant.
- The risk of bumblebees escaping into the environment and spreading weeds were too great.



**ABOVE: Scientific comparison between the effectiveness of honeybee (*Apis mellifera*) and bumblebee (*Bombus terrestris*) as pollinators of greenhouse sweet pepper (*Capsicum annuum*)**  
Dag, A. and Kamer, Y. (2001)

Because these concerns are not widespread and cannot be demonstrated by the available scientific evidence, the Minister was forced to rely on the precautionary principle. The principle is applied on the basis that lack of full scientific certainty should not be used as a reason for postponing a measure to prevent degradation of the environment where there are threats of serious or irreversible environmental damage. However it is important to note that the Minister did not determine such threats existed.



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**Competition With Honeybees**

It has been alleged by the Commonwealth Department of Environment that bumblebees could adversely impact on honeybees, however it is a fact that nowhere else in the world has this been raised as a concern .

Honeybees and many species of bumblebees coexist in the Northern Hemisphere, where both originated. Honeybee colonies last several years, may contain thousands of individuals, and contain honey stored for future needs.

In contrast a bumblebee colony lasts only several months, may contain between one and at most a few hundred individuals, and contains only enough honey for immediate use.

There are also major differences in foraging preferences and communication abilities, with a bumblebee's foraging range also much more restricted. The range of a bumblebee is estimated to be no greater than 5 kilometres.

If there is any competition at all, at most it is only going to be transitory and local. Researchers from the University of Tasmania have attempted over several years to demonstrate the negative effects of bumblebees on native flora and fauna, and have consistently failed to establish any link between bumblebees and decline of native fauna or an increase in 'sleeper' weeds.

It has also been noted by Costa that in using honeybee hives for our raspberry crops in Tasmania, the honeybees actually kill the bumblebees when they attempt to enter the hive. The evidence of this is the large collection of bumblebee carcasses immediately on the ground at the base of the hives.

It should not be forgotten that the honeybee as we know it in Australia is not a native bee and was originally introduced from Europe.

Should honeybees in Australia contract varroa mite, or be decimated by other parasites and pathogens, there will be a major shortage of pollinators. While native bees may assist in the summer months, bumblebees will work in cooler temperatures and can be managed commercially to provide pollination on demand.

**Impact On Humans**

While bumblebees can certainly sting if provoked, they are not aggressive and stings are rare. In the northern Hemisphere many species of bumblebees coexist with each other and with humans without this being an issue except for rare cases. Bumblebee production facilities and greenhouses using bumblebees usually keep Epi-pens on hand in case of an allergic reaction.

It is virtually impossible to respond to decisions relying on the precautionary principle because they are not data based and cannot be subjected to analytical examination.

Further, the Minister did not investigate the impact of bumblebees on the environment of New Zealand, a country where bumblebees have been present for at least 150 years or Tasmania where they have been present for 20 years.

While the Minister made his decision in part because of the risk of bumblebees establishing themselves on the mainland he did not examine why they have not done so already even though they have had 20 years to do so.

The AHGA's submission addressed comprehensively (citing 500 references) and scientifically the various arguments which have been raised against the importing of bumblebees into Australia for commercial purposes.

The fact that the use of bumblebees in Tasmanian commercial glasshouses in particular is prohibited under the EPBC Act is simply absurd. The basis for their prohibition is that it cannot be proved that the bumblebees were introduced lawfully.

This situation is depriving the state of Tasmania the opportunity to capitalise on a competitive advantage with respect to glasshouse horticulture. If bumblebees could be used in Tasmania, it would also provide a genuine and new growth opportunity for the beekeeping industry to provide pollination services to the horticulture industry.





## Native Pollinators

Because there were claims that Australian native bees could replace the need for bumblebees in pollinating greenhouse tomatoes, the submission to the Environment Minister as referred to above examined this issue extensively. The most likely candidate is the buzz pollinator *Amegilla*, the blue banded bee. While it is an efficient pollinator, it is not a social bee and has no commercial value or use except on a limited scale as a pollinator for seed crops in greenhouses. Research was funded for several years with little result.

Beyond *Amegilla* there are no known native Australian bees that have the capacity to service commercial glasshouse horticulture in Australia.

## Spread of Diseases

Pathogens and parasites of bumblebees are well documented and are a concern primarily to other bumblebees. Very few are relevant to honeybees. Nowadays, with improvements in technology, these can be screened for at the point of entry into the country. New Zealand populations are not entirely free of harmful parasites and predators but the Tasmanian population arrived with only a common nest commensal mite, easily eliminated. The Tasmanian population of bumblebees could potentially be used as a basis for commercial production within Tasmania and colonies exported to the mainland.

## Global Competition

Like most other areas of primary production, glasshouse farming is subject to intense international competition.

New Zealand (where bumblebees are present and legal) exports about 4000 tonnes of tomatoes p.a. to Australia (worth about \$A4.26m), the Pacific Islands and Japan.

In November 2013, New Zealand grown 250g strawberry tomato (strawmato style) and plumato cherry tomato punnets were selling in Sydney based Aldi stores for \$3.99 each versus the Costa Perino 200g product selling at \$4.48 each.

This price difference is almost exclusively attributable to New Zealand growers being able to use bumblebees.

Over one million bumblebee colonies were produced globally in 2004 for pollination purposes for use in up to 40 countries in Europe, Nth America, Sth America and Asia.

These countries include China and South Korea, with China also being a major and growing threat to the Australian horticulture industry.

China has the largest protective cropping - glass/greenhouse industry in the world with in excess of 1.6 million hectares of glass/greenhouses and this area is rapidly growing.

China already is a major exporter of tomatoes in the South East Asia region and according to the Australian Bureau of Agriculture and Resource Economics and Sciences 'What Asia Wants - Long term food consumption trends in Asia' (October 2013), China is the largest producer of horticultural products in the Asia region and is a net exporter (in value terms) of horticultural produce.

In the event of a free trade agreement with China, which the Federal Government has signalled as a priority to be concluded within the next 12 months, Australian glasshouse tomato growers would be at a significant disadvantage against the Chinese, not only with respect to labour costs and environmental laws and regulation, but also key factors of production i.e. the use of bumblebees.

Bumblebees are also used in commercial glasshouses in South Korea, Japan, Chile and Peru. The Australian Government signed a free trade agreement with South Korea and is furthering trade liberalisation with Chile and Peru via the Trans-Pacific Partnership. Once again the Australian glasshouse industry would not be competing on a level playing field with these countries.

Covered production (ie. protective cropping) is important for much of Japan's vegetable production and increasingly for fruit, with 70% or more of tomatoes grown under cover.

In 2010, South Korea had 52,000 ha of horticultural production under protective cover, including significant tomato and strawberry plantings.

Biosecurity Australia already has approved the import of glasshouse tomatoes from New Zealand and Holland, thus placing the local industry at a competitive disadvantage domestically as well as internationally.

## Costa's Conclusion

The ability of commercial glasshouse horticultural producers to pollinate their crops with bumblebees would be of considerable economic and environmental benefit.

This would also potentially generate a level of demand for bumblebees and pollination services that would create a strong growth opportunity for the beekeeping industry, which has historically struggled economically and has little to no opportunity for diversification.

In particular, the Federal Government would be providing the state of Tasmania with a genuine competitive advantage if it were to take action and allow bumblebees to be used in commercial glasshouses in Tasmania.

Given that bumblebees have been known to exist in the Tasmanian wild for at least the last 20 years and during this time there is no credible evidence to suggest they have had a negative impact on the Tasmanian environment nor have they managed to become established on the Australian mainland, the current situation where the use of bumblebees in Tasmania is prohibited is simply and patently absurd.

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