



A failed invasion

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Alien species – plants and animals that become established outside their native home – can cause problems if they monopolise the food and habitats of indigenous species. But things don't always end badly for the locals, as Thomas Ings and colleagues from Queen Mary University found out.

Bumblebees are important pollinators and each year commercial growers around the world use nearly one million colonies of *Bombus terrestris* in greenhouses. As a result of commercial importation, the species has become established in at least two countries where it is not native, Chile and Japan.

Crop-growers in southern France alone imported thousands of colonies of the bumblebee subspecies *B. terrestris sassaricus* from Sardinia, between 1989 and 1996.

A potential risk of introduced subspecies (different populations within the same species) is that they can alter the population structure of a native species through interbreeding or competition.

Non-natives can have potentially large ecological and economic costs too. For example, they might out-compete a native species and take over their habitat

completely, but then fall prey to local pests or environmental change (something that's already being seen with farmed fish), resulting in the total loss of an important pollinator with potential knock-on effects to crops and the animals that eat them.

It only takes a single fertilised queen to establish a breeding colony, and commercially reared bumblebees tend to be selected for traits that are good for the growers – which can lead to the production of more queens. So if the new subspecies became established outside the greenhouses, it could be a real threat to the three subspecies already in residence in southern France.

Together with Pierre Rasmont from the Université de Mons-Hainaut, we monitored the bumblebees in a long-term study that covered the whole of southern continental France over several years. In all, we counted 8424 *B. terrestris*, singling out any incomers by their reddish-brown legs and

lack of the distinctive yellow collar on the thorax sported by the native French bees.

We found male and queen *B. t. sassaricus* close to commercial greenhouses in the 1990s – clear evidence that imported bumblebees had escaped. Then two years after importation had stopped we found several bees more than 30km from the nearest greenhouse. Bumblebees don't live long, so this means they must have bred and become established in the wild.

But when we looked again six years later we found no sign of them, which was a real surprise because the conditions appeared to be perfect for them.

We wouldn't rule out the possibility that the bumblebees have interbred, producing a hybrid that was harder to spot. But in this case it looks like the natives foiled the would-be invaders by out-competing them for food and habitat, and stopped them gaining a permanent foothold. ■