

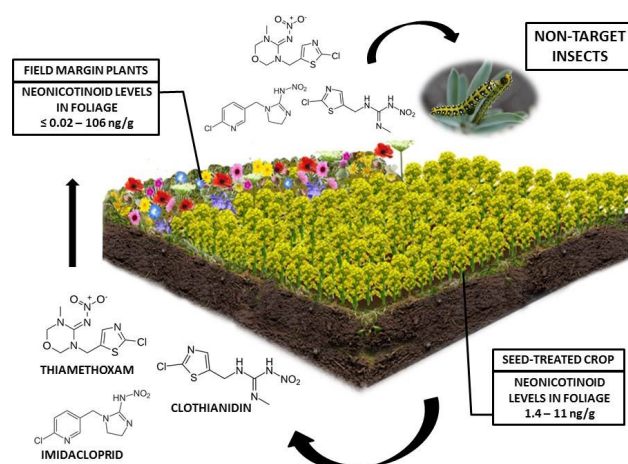


This issue is edited by [Dr Beth Nicholls](#). Each issue will be edited by a different member of the [team](#).



In the June issue of our quarterly [Buzz Club](#) newsletter we report on a recent paper by Dr. Cristina Botías investigating the exposure of herbivorous insects to neonicotinoid pesticides in farmland. Prof. Dave Goulson gives us an update on his hoverfly lagoons—remember it's not too late to [make one yourself!](#) We'll take

a peak inside a bumblebee nest, and get an update on what's been turning up in the pan traps. Linda will also tell you all about her new [Garden Shop Calculator](#), which allows you to calculate how much the food you grow would be worth in the shops. Plus exciting news, the welcome packs for members are ready!

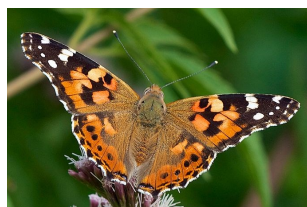


Beyond the Bees...

By [Dr Cristina Botías](#)

Wildflowers growing along the edges of fields provide food and homes for a wide range of insects, many of which are helpful to farmers, either by pollinating the crop or by eating pest species which could otherwise damage the food being grown. However scientists are worried about whether these habitats are being polluted with pesticides that are used on crops to kill insects that cause damage. Neonicotinoids are a particular type of pesticide that affect the brain of insects. They are very water soluble and last in the soil for a long time. [Previous work from The Buzz Club scientists](#) has found that these chemicals spread into the surrounding soil and get taken up by the roots of wild plants growing

at the edge of the field, next to the crop. A lot of research has looked at the risks to bees from eating the pollen and nectar of plants contaminated with pesticides. However very little is known about the risk to other insects living in farmland, such as butterfly caterpillars or beetles, which could be ex-



posed to these chemicals by eating or touching contaminated leaves. Neonicotinoids are taken up through the roots, and then enter all parts of the plant such as the stem and leaves. This means any boring, sucking, chewing

or root-feeding insect could end up eating a harmful amount of pesticide when feeding on a contaminated plant. For this reason, we collected vegetation from lots of different wild plants growing at the edges of farmers' fields, and from the crop itself, and looked at the levels of neonicotinoids found in the leaf tissue. [We found neonicotinoids in half of the wild plants we looked at](#), sometimes at higher levels than in the crop. Worryingly, often levels were high enough to kill some farmland insect species, based on data we found from previous scientific experiments. We found up to three different types of neonicotinoid pesticide in some plants, which means we need to learn more about the effect

on insects of eating different mixtures of pesticides. The fact that lots of plants were contaminated with these insecticides in wild plants means scientists need to understand more about the potential effects on important farmland insects that live on the edges of fields, which are sometimes the only suitable areas of habitat available to them in rural areas. Hedgerows and the edges of fields can actually help the farmer to produce more food by providing nest sites and food for pollinators, as well as habitat for natural predators of crop pests. If these habitats are being polluted with insecticides then this may be damaging both our environment and farmers' ability to produce food.

It's not just bees that are exposed to neonicotinoids...

Dave's Hoverfly Lagoons By Prof Dave Goulson

With our in-house hoverfly expert Dr Ellie Rotheray away on maternity leave (hopefully by the time you read this she will have a baby boy), I am standing in to give an update on our hoverfly lagoons project. I am no hoverfly expert, but I have found making and observing

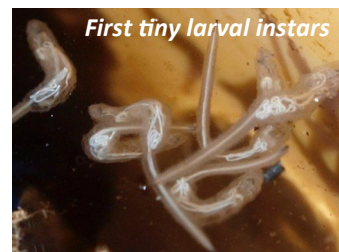
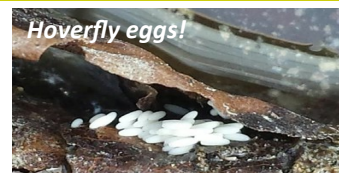


my own lagoons to be brilliant fun. I'm lucky enough to have a big garden, and to have inherited with it, scattered amongst the overgrown nettles and brambles, a selection of old containers suitable for making a fine array of lagoons. These include various plastic trays, a long, deep plastic window box, a galvanized metal dustbin, and a large metal jam-making pot. I

have to admit that they aren't beautiful, and they are much larger than the plastic milk-bottle setups that Ellie has experimented with, but I figured the bigger they were, the more hoverflies I would get. I have five in total, and in the winter of 2016 I set two up with wood shavings, two with grass cuttings from the lawn, and one with grass cuttings plus some well-rotted compost from the bottom of my compost heap, all topped up with rainwater (though tap-water will do). Every month since I've been searching though the gloop for hoverfly larvae.

The ones with wood shavings have been useless so far – nothing has gone near them, and the wood shavings appear to be unchanged. I will leave them a year or two as perhaps when the shavings eventually start to rot they will attract something. Hoverfly larvae feed on bacteria so they need the substrate to be actively de-

composing. I had high hopes for my grass-cuttings and compost lagoon, but it has also been a bit of a disappointment; it smells rather ripe, much more so than the others, and has attracted a dozen or so handsome ginger dung flies (*Scathophaga stercoraria*). They are territorial, and so are constantly fighting, which is fun to watch. They are also predators of small insects, so that may well be putting off female hoverflies looking for somewhere to lay their eggs; so far I have had no hoverfly larvae in this lagoon. I've nothing against dung flies, but they weren't what I was aiming for. Luckily my two grass-cutting lagoons have been rather better; in April I saw clusters of white, elongate eggs, a little like miniature grains of basmati rice. By May both lagoons had dozens of long-tailed larvae. Some of these have now pupated; when full grown each larva crawls out of the lagoon and drops to the



ground to find a quiet spot to turn into a pupa, a brown, barrel-shaped object which still retains the long tail and has two breathing holes which look a little like a pair of ears. I have found some of them and put them in a jam-jar to see what hoverfly species emerges. I can heartily recommend having a go at making your own lagoon, using any materials that come to hand; it couldn't be easier. Check out this [short video](#) and visit [@HoverflyLagoons](#) for inspiration. [It's not too late to make one](#) for this year, for hoverflies breed continuously through the spring and summer. No wildlife garden is complete without a hoverfly lagoon!

P.A.N Update By Dr. Rob Fowler

The third year of our Pollinator Abundance Network ([P.A.N. project](#) (the first official project under the Buzz Club banner) is well underway. Our participants have been busy with their May and June sampling, placing pans out in their garden to see what insects they can find. This year sees a slight change in our methods, as we are asking you to place two sets of pans out rather than just one. We have done this to try and capture a better picture of what pollinating insects are in your garden. The weather in May and June has

been typically uncertain, as I write this even now the wind and rain are beating against my office window. So it is completely understandable if you have struggled to find a 48 hour window of good weather to do your pan sampling. The BBC online weather forecast is what we use to assess the weather for our experiments and it is surprisingly accurate. Please do not worry if the weather isn't ideal for the entire 48 hours the pans are out, as long as the pans do not overflow with water due to heavy rains then they should be fine.

Initial results for this year appear promising, with warm sunny days between periods of poorer weather playing host to an abundance of bee and hoverfly species. We hope this continues in July and August. If you have any question, please don't hesitate to get in touch with us at buzzclub.uk@gmail.com.

*The bee-fly *Bombylius major* was spotted in a few samples. The females flick their eggs into the nests of solitary bees and their larvae then feed on the food stored in the nest, as well as the young bees. Check out [this video](#) to see them in action!*



Clare Flynn [@wildaboutnature](#) kindly sent us a photo of her PAN project set up.

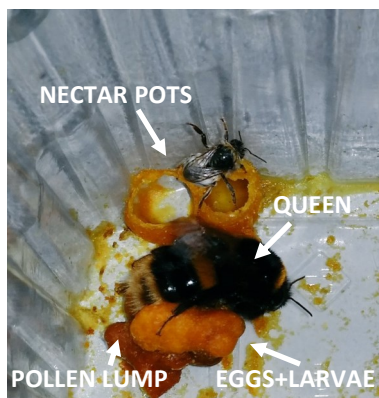


Rearing Bumblebees

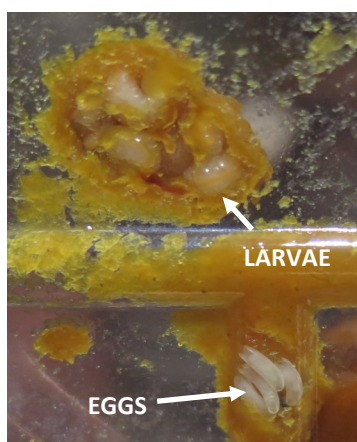
By Dr. Beth Nicholls

In March this year I collected wild buff-tailed bumblebee queens (*Bombus terrestris*) from the university campus here at Buzz Club HQ, for an experiment looking at the effects of neonicotinoid pesticide exposure and poor diet on bumblebee colony growth. Queens were kept in fruit punnets in the lab and were provided with sugar water and small lumps of pollen on which to lay their eggs. We recorded how much food they ate and weighed and photographed the colony once per week, recording when any new

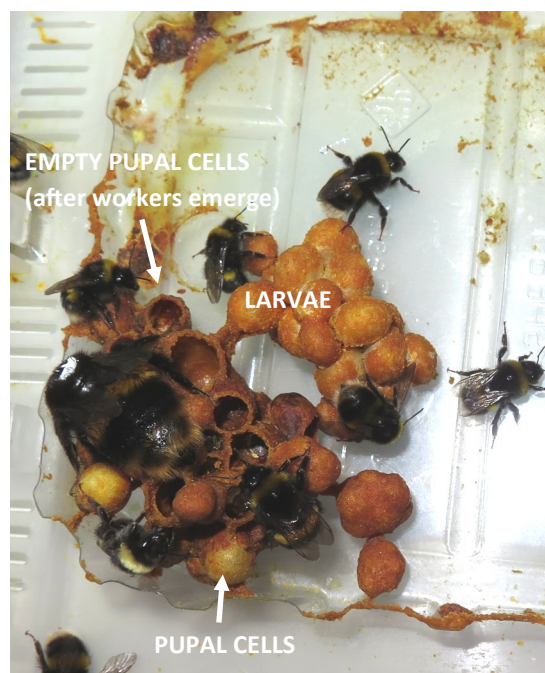
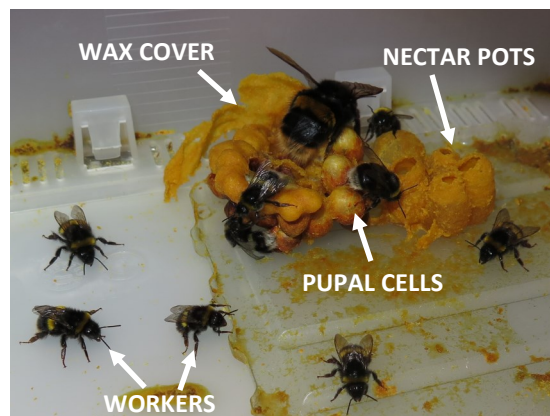
workers emerged. I thought I would share some pictures of the queens in action! The experiment is still ongoing— the queens and their small colonies have been released back into the wild now and we are monitoring their growth by weighing the nests and checking for dead bees every couple of days. Watch this space for the results of the experiment! coming soon.



Queen incubating eggs which have been laid on top of pollen lump and then covered with wax. Note the first small worker. She is still pale so has only emerged recently.



Looking from below the colony you can see eggs and larvae underneath the wax covering.



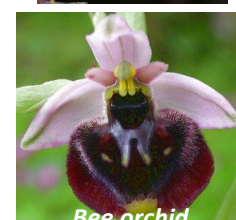
As the colony grows, more workers emerge and help with incubation and feeding larvae. In the top photo, workers have started to build a wax covering for the nest.

Pollinator Corner: Southern Cuckoo Bumblebee

The star of this issue is the southern cuckoo bumblebee, *Bombus vestalis*. Just like the birds of the same name, females hunt out the nests of other bees, such as *Bombus terrestris* (see above) to lay their eggs in, instead of building their own nest. To avoid being attacked by the host queen or workers, usually females will hide for a while after entering the nest so that they start to smell the same. Cuckoo bees do not produce workers, instead they let the

workers of the host nest do all the hard work! Typically *Bombus vestalis* will fight and kill the host queen, as well as any eggs or larvae present in the nest, so that the attention of the workers is just focussed on rearing her offspring. Cuckoo bees can be easily told apart from other bumblebees by the lack of pollen baskets on their hind legs— they don't need to collect pollen from flowers as the host workers do it for them! However, after leaving the host nest males and females

do visit flowers to drink nectar, pollinating as they go. Indeed, in another interesting tale of deception, the flowers of the bee-orchid *Ophrys chestermanii* look and smell very similar to female *Bombus vestalis*, (at least from a male bees' perspective!) tricking the males into landing on the flowers to try and mate and pollinating the orchids at the same time. You can find out more about bee orchid pollination in [this video](#).



Buzz Club News

WELCOME PACKS ARE HERE!

The biggest news from The Buzz Club HQ is that the welcome packs have arrived and should be winging their way to you shortly. A big thank you to everyone for your patience! Inside you'll find a seed mix that has been specially designed by scientists at The Buzz Club to attract pollinators to your garden, plus guidelines on how to sow them to make sure you really get the best out of the wildflower mix. You'll also receive an excellent guide to pollinator-friendly gardening, an ID chart and a handy magnifier that fits into a purse or wallet and can be used to get a better look at any interesting wild-life you might find on your travels. Pop the stickers on your car or window and let everyone know you're a citizen scientist!



Please let us know if you like the packs and send us some photos of you using the kit!

How much does your garden grow?

Have you ever wondered how much the fruit and veg you grow in your garden or allotment would be worth if you bought it at the supermarket? Well now there's an easy way to find out thanks to the [Garden Shop Calculator](#), designed by PhD student [Linda Birkin](#). Simply enter your yields into our handy spreadsheet and it will automatically calculate how much that produce would cost to buy, as well as exactly how much of that value you 'owe' to pollination by insects. It's free to use so give it a try and let us know how you get on!



To give you some of idea of what you might find, Linda analysed some data provided by [Bees n Beans](#) volunteers last year. Total values ranged from £10 to a whopping £800+, with the largest value attributable to insect pollination being a very healthy £427. Interested? [Sign up here](#) and help us calculate how much your garden grows.

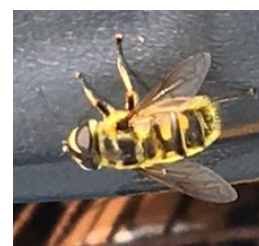
Tweets!



[@DaveGoulson](#) has got bumblebees in his shed. Check out his [video!](#)



Lola and her family drank a lot of milk to make their lagoons! [@GorillaMorals](#)



[@Alottyj](#) has *Myathropa florea* visiting her lagoons

Send photos or feedback to us at buzzclub.uk@gmail.com, [@The_Buzz_Club](#) or on [Facebook](#) and we'll add our favourites to the next newsletter!

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We are a group of scientists and non-scientists, adults and children, working together to find out more about bees and other pollinators. The Buzz Club's goal is to ensure that we look after our wild bees and other insects, giving them a future. We can only do this if we understand more about them; why are some disappearing, how many are left, and where are they? How fast are they declining? What can we do best do to help them?

Visit our website

www.thebuzzclub.uk

Help us study and save pollinators!