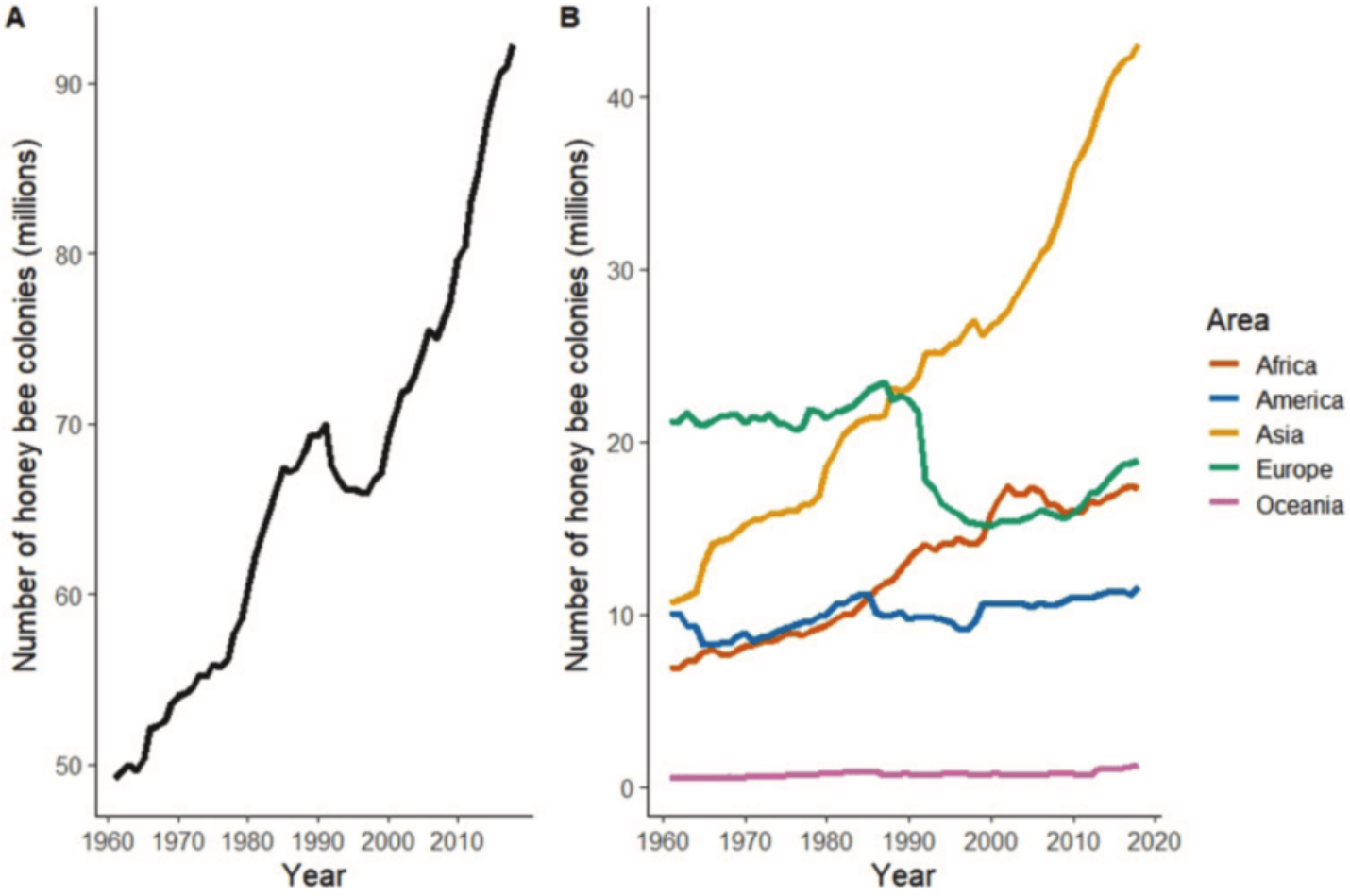
Managed honeybee and bumble bee colonies in the US are up as much as 85%, a 60 year high, as independent researchers challenge bee apocalypse narrative

The Western honey bee (*Apis mellifera*) is amongst the best-monitored insects but the state of other managed pollinators is less well known.

Here, we review the status and trends of all managed pollinators based on publicly accessible databases and the published literature.

We found that, on a global scale, the number of managed *A. mellifera* colonies has increased by 85% since 1961 [with every region showing increases except Europe, which began reversing its decline in 2010], driven mainly by Asia. This contrasts with high reported colony overwinter mortality, especially in North America (average 26% since 2007) and Europe (average 16% since 2007).



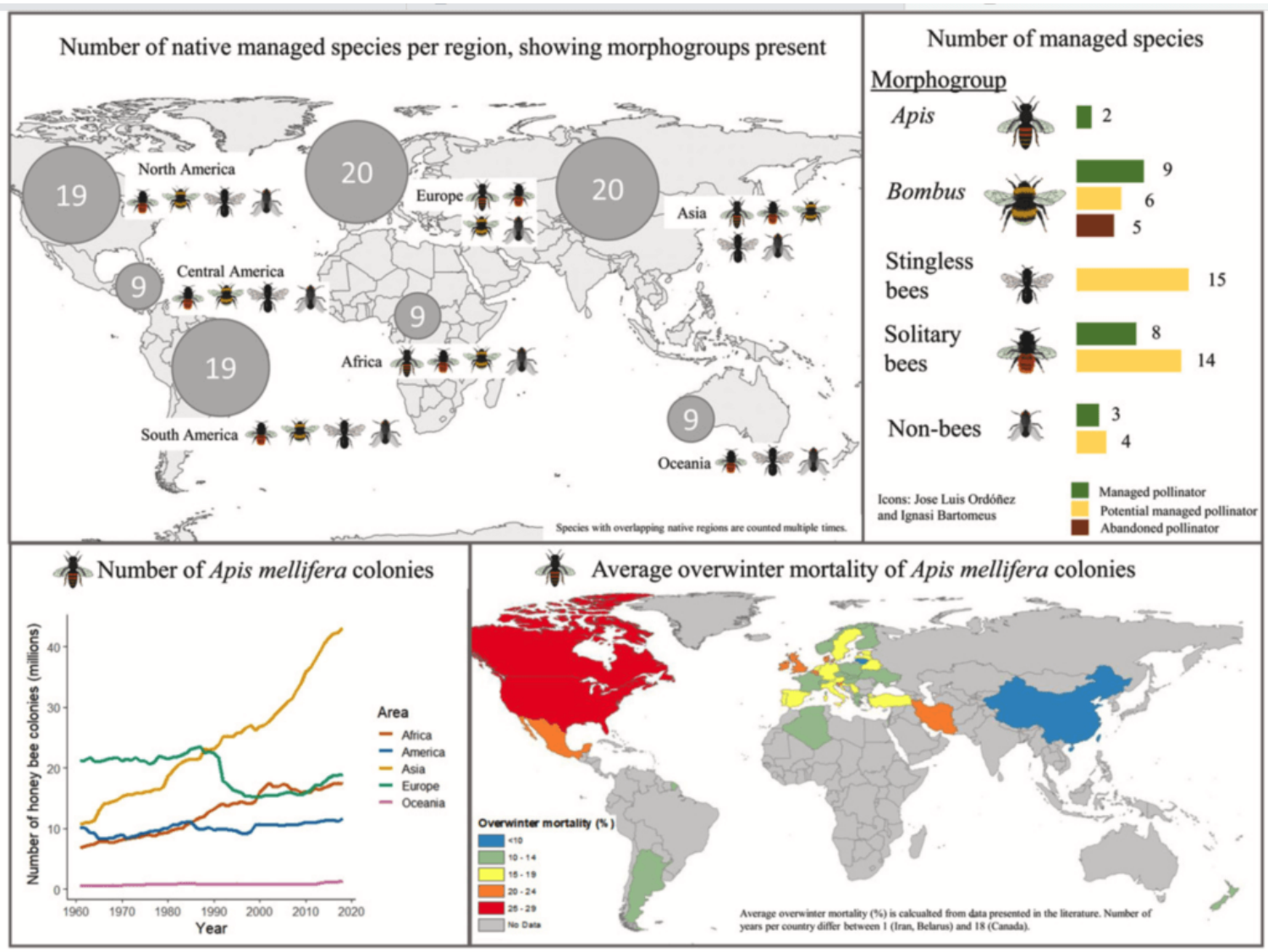
Increasing agricultural dependency on pollinators as well as threats associated with managing non-native pollinators have likely spurred interest in the management of alternative species for pollination, including

bumble bees, stingless bees, solitary bees, and flies that have higher efficiency in pollinating specific crops.

We identify 66 insect species that have been, or are considered to have the potential to be, managed for crop pollination, including seven bumble bee species and subspecies currently commercially produced mainly for the pollination of greenhouse-grown tomatoes and two species that are trap-nested in New Zealand.

To ensure sustainable, integrated pollination management in agricultural landscapes, the risks, as well as the benefits of novel managed pollinator species must be considered.

We, therefore, urge the prioritization of biodiversity-friendly measures maintaining native pollinator species diversity to provide ecosystem resilience to future environmental changes.



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There are, however, some general patterns that can be discerned from the data. North American beekeepers have experienced higher overwinter mortalities of 26% (± 7% S.D.) than beekeepers in Europe (16% ± 8% S.D.), who themselves experienced higher losses than other regions (11% ± 4% S.D.; post-hoc analysis, $P < 0.005$; Fig. 4 A and Fig. 5). Fluctuations within regions can be large; within Europe, several countries reported annual overwinter losses above 30% in one or more years, for example during winter 2007/08 or winter 2009/10 (Fig. 4B).

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Discussion

We clearly demonstrate an increase over the past seven decades in the number of insect species, particularly bees, which are managed as pollinators, as we expected. For the most numerous commercial insect pollinator, the Western honey bee (*A. mellifera*), the number of colonies worldwide has also increased over the past seven decades despite high overwinter colony losses in Northern temperate regions of the world.

Though our data do not address the cause or causes for the increase in the number of managed insect pollinator individuals or species, we hypothesize that the greater reliance of agriculture on insect pollinator-dependent crops (Aizen et al., 2009; 2019), the rise in crop cultivation under permanent cover (Cuesta Roble, 2020), and the rise in awareness of the negative effects of non-native pollinators on local species (Aizen et al., 2020) may all have been important in increasing the demand for managed pollinators, as outlined in our first two hypotheses. For those bee species that produce a surplus of stored honey or other products, increasing market prices might also have led to greater uptake of managed species. High overwinter mortality of *A. mellifera* might have a minor influence, as two-thirds of the species have been mentioned before 2007, when honey bee mortality became widely publicized (Oldroyd, 2007), and regions with higher honey bee overwinter mortality rates such as North America do not have particularly high numbers of native or alternative managed pollinator species.

Bumble bees

The rising number of managed bumble bee species and number of colonies might be driven by a trend towards more cultivated area under permanent cover (Cuesta Roble, 2020), as honey bees do not perform well in these environments. Moreover, honey bees are unable to buzz pollinate (Buchmann, 1983) and, therefore, are unlikely to provide an adequate pollination service to buzz-pollinated crops like tomato that are regularly grown under cover.

Conclusions

The number of insect species managed for pollination, especially bees, has increased markedly over recent decades, paralleled by a growing number of honey bee colonies and commercially-reared bumble bee colonies. Currently, 66 species are known as manageable pollinator species globally. While some taxonomic groups (e.g., solitary bees) and species native to geographical regions (e.g., North America) have long been used as managed pollinators, others have only been considered rather recently (e.g., stingless bees and species from South America).

The rise in consumer demand for pollination-dependent fruits, nuts, and seeds is likely driving the increasing dependence of agriculture on pollinator-dependent crops and the trend towards crops cultivated under permanent cover. At the same time, there is growing awareness and recognition of the negative effects of non-native species on local pollinators. Only a few bee species are commonly used in pollination, which represents a challenge for food security and farmer livelihoods. For instance, we demonstrate high mortalities of *A. mellifera* colonies, the most widely used managed pollinator, especially in North America.

This highlights the need to preserve wild pollinators, e.g., through pollinator-sympathetic land management, as well as to consider a more diverse set of managed pollinator species. Though the management and deployment of novel pollinator species are not without risks, particularly if employed in locations where a pollinator is non-native, crop-specific and sustainable management of a diversity of new pollinator species may contribute to safeguarding future crop yields and food security.

This is an excerpt. Read the original post here.