Aphids are sentinels of climate change

August 6 2008

Aphids are emerging as sentinels of climate change, researchers at BBSRC-supported Rothamsted Research have shown. One of the UK's most damaging aphids - the peach-potato aphid (Myzus persicae) - has been found to be flying two weeks earlier for every 1°C rise in mean temperature for January and February combined.

This year, the first aphid was caught on 25 April, which is almost four weeks ahead of the 42-year average. This work is reported in BBSRC Business, the quarterly research highlights magazine of BBSRC (the Biotechnology and Biological Sciences Research Council).

Dr Richard Harrington of the Rothamsted Insect Survey said:
"One of the most noticeable consequences of climate change in the UK is the frequency of mild winters. As a direct result of this, aphids seeking new sources of food are appearing significantly earlier in the year and in significantly higher numbers. We have been studying the seasonal biology of aphids for a long time now and we know that populations can continue to grow over the winter and spring provided that conditions are warm enough. After a warm winter, there are much larger numbers flying and they are hence detected much earlier. This means that there are more aphids flying in spring and early summer, when crops are particularly vulnerable to damage."

Scientists at Rothamsted Research have been monitoring the flying form of all aphid species for 42 years. They use a network of 16 suction traps (12 in England and 4 in Scotland), placed at various sites, to collect a representative sample of all flying insects.

The long term data on aphids can be used to understand the wider implications of climate change, and also to prepare for the season ahead by determining the need for and timing of aphid control measures (based on preceding winter temperatures). As well as being important indicators of a changing climate, aphids can cause devastating damage to crops. They extract large amounts of sap, weakening the plant, and also spread plant viruses.

In addition, because the sap is very high in sugars the aphids excrete very sticky honeydew, which can encourage the growth of sooty moulds that build up and prevent sunlight from reaching the leaves, causing further weakening.

Professor Nigel Brown, Director of Science and Technology, BBSRC said:
"Environmental change is one of the big challenges facing the world today. These long-term data on the seasonal appearance of flying aphids not only show that there are already noticeable changes in the UK climate, but they also provide the knowledge which will help to mitigate the consequences."

Source: BBSRC