Air pollution threatens natural pest control methods in sustainable farming

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"Diesel and ozone appear to make it more difficult for the wasps to find aphids to prey upon and so the wasp population would drop over time."

When fields of oilseed rape are exposed to diesel exhaust and/or ozone—both found in emissions from diesel burning vehicles and industry—the number of parasitic insects available to control aphids drops significantly, according to research published in the Proceedings of the Royal Society B today.

The team, led by scientists from the University of Reading, used special equipment to deliver controlled amounts of diesel exhaust and ozone to oilseed rape plants. They also added aphids to the plants and measured the reproductive success of parasitic wasps that habitually lay their eggs inside a freshly stung aphid.

Dr. James Ryalls of the University of Reading said, "Even at the levels we used, which were lower than safe maximums set by environmental regulators, the overall numbers of parasitic insects still fell. This is a worrying result as many sustainable farming practices rely on natural pest control to keep aphids and other unwelcome creatures away from valuable crops.

"So, we could speculate that the stronger smell attracts the wasps and they are more successful in finding and preying upon aphids, that way. It could be that D. rapae is a good choice for pest control in diesel and ozone polluted areas. This really goes to show that the only way to predict and mitigate the impacts of air pollutants is to study whole systems."

As transport shifts away from diesel and towards electric motors, air pollution will change. Knowing how pest-regulation service providers such as parasitic wasps respond to these progressive changes will be essential to planning mitigation strategies to ensure sustainable food security, now and in the future. This research shows that we also must consider the impact of pollution on the plants, wasps, and prey insects, and the interactions...
among all three.


Provided by University of Reading


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