

Get Ready to Itch and Sneeze; A warmer planet could mean we'll suffer more (and stronger) allergies.

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Abstract (Summary)

As one of 40 million Americans who suffer from hay fever, Lewis Ziska carries an inhaler in his pocket and takes a whiff to clear his lungs on bad allergy days. But hay fever is more than a personal-health issue for Ziska. A weed ecologist with the U.S. Department of Agriculture's Crop Systems and Global Change Laboratory, Ziska is a leading researcher in the fledgling field of allergies and climate change.

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As one of 40 million Americans who suffer from hay fever, Lewis Ziska carries an inhaler in his pocket and takes a whiff to clear his lungs on bad allergy days. But hay fever is more than a personal-health issue for Ziska. A weed ecologist with the U.S. Department of Agriculture's Crop Systems and Global Change Laboratory, Ziska is a leading researcher in the fledgling field of allergies and climate change. His findings regarding ragweed, an invasive plant whose pollen is the leading trigger of fall hay fever, are nothing to sneeze at. Global warming and increased atmospheric carbon dioxide from burning fossil fuels appear to supercharge the growth of ragweed. And not only does ragweed grow larger and produce more pollen, its pollen is more allergenic, studies show.

People allergic to ragweed aren't the only ones who'll be sniffing more. Studies show that increased CO₂ levels increase the level of tree pollen, a common source of allergies in springtime. There's evidence that warmer temperatures in Alaska have led to increases in yellow-jacket stings, bad news for people with bee-sting allergies. Not even your basement will be safe: fungal spores also proliferate in warmer temperatures and thrive when carbon-dioxide levels rise.

To test his ragweed hypothesis, Ziska planted the weed in three plots: a rural farm, a semi-rural county park and downtown Baltimore. The urban plot's ragweed produced four times the pollen count of the rural site. Cities already have more carbon dioxide than rural areas and are hotter, Ziska says. Cities are a surrogate for global warming.

The impact of global warming and increased CO₂ on allergies is also being studied by government agencies, scientists and doctors. The Environmental Protection Agency's National Center for Environmental Research is soliciting proposals for climate change and allergy studies to receive funding. The Intergovernmental Panel on Climate Change the leading international authority on man-induced warming and the EPA both cited increased allergic reactions due to climate change as a growing concern in 2007 reports.

Allergists are also worried. One new concern: a startling rise in the amount of tree pollen. Warmer temperatures in Europe are causing birch trees to bloom earlier, prompting an earlier and perhaps longer allergy season. Studies at Duke University show that elevated carbon dioxide increases pollen production of loblolly pines. Allergists suspect that record pollen counts are contributing to the onslaught of new allergy and asthma patients. I'm seeing an epidemic of new cases, says New

York City allergist Clifford Bassett.

Christine Rogers of the School of Public Health and Health Sciences at the University of Massachusetts is working with the USDA's Ziska on a study of fungal spores, which cause allergies in about 10 percent of the public. We have a greater proportion of the public that is sensitive to allergens, so the question of how climate change affects this is ever more important, says Rogers. Fungi everything from mushrooms in the woods to fungus that grows in damp basements play an important role in the ecosystem by decomposing plants. If plant biomass increases due to elevated CO₂ and global warming, fungi may proliferate as well, they suspect. Fungal spores are problematic because they affect air quality indoors as well as out. Higher temperatures will lead to increased use of air conditioners, which spread spores if improperly maintained. Heavier rainstorms and floods predicted under climate-change scenarios will also increase indoor dampness, allowing fungal spores to proliferate in homes and buildings, according to the 2007 study *Climate Change, Aerobiology, and Public Health in the Northeast United States*.

City dwellers who suffer from asthma already are being hit by a nasty synergy of hotter temperatures, smog and increasing pollen counts, says Paul Epstein of Harvard's Center for Health and Global Environment. A large percentage of asthmatics are also allergic to pollen. These patients suffer from a double whammy of pollen and smog on days when ground-level ozone levels are high.

Country folk face new challenges, too. Poison ivy, a woodland plant that causes itching and a weepy rash, is becoming more toxic. Researchers at Duke University stumbled across this discovery while conducting an experiment that involved pumping extra carbon dioxide into a plot of pine trees to see whether the forest would soak up and sequester more carbon, mitigating climate change. But they noticed that poison ivy on the forest floor proliferated. Subsequent testing showed that the poison ivy's rash-causing oil, urushiol, was more potent than normal.

Climate change could also spell trouble for people allergic to stinging insects. Alaska, which is warming faster than the rest of the country, could be a test case. In some areas, reports of severe stings from Hymenoptera the insect order that includes bees, wasps and yellow jackets are up 600 percent in eight years. Jeffrey Demain, an allergist with the Allergy, Asthma and Immunology Center of Alaska, says yellow jackets and wasps are showing up in places they never lived before.

Skeptics sometimes cite increased crop yields and more-prolific plant growth as reasons to be unconcerned about global warming. But if Ziska and his cohorts are right, the coming global greenhouse will be a sneezier, wheezier and rashier place and many more people may be whiffing from inhalers.