Rising CO2 levels makes pollen less nutritious for bees, may contribute to colony collapse

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. . . [S]cientists testing the pollen content from goldenrod collected between 1842 and 2014, when atmospheric concentrations of carbon dioxide rose from about 280 parts per million to 398 ppm, found the most recent pollen samples contained 30 percent less protein. . . .

More than 100 previous studies have shown that elevated levels of atmospheric carbon dioxide decrease the nutritional value of plants, such as wheat and rice. But the goldenrod study, published last month, was the first to examine the effects of rising CO2 on the diet of bees, and its conclusions were unsettling: The adverse impact of rising CO2 concentrations on the protein levels in pollen may be playing a role in the global die-off of bee populations by undermining bee nutrition and reproductive success.

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A number of new and accumulating pressures are threatening bee populations. From 2006 to 2011, annual losses from managed honeybee colonies averaged 33 percent per year in the United States, according to the USDA. Beekeepers have had to replace 50 percent of their colonies in recent years. Factors such as mite outbreaks and the use of neonicotinoid pesticides have been implicated in so-called "colony collapse disorder."

"I am not saying that understanding neonicotinoids or Varroa mites is not important, but I am saying that how bees respond to these stressors might have something to do with their nutrition," says Lewis Ziska, a plant physiologist at the USDA Research Service in Maryland and lead author of the study. "If we are mucking around with their nutrition, all these other responses could be affected."

Read full, original post: How Rising CO2 Levels May Contribute to Die-Off of Bees