CO2, Global Warming, and Pollen−Allergies

By Thomas Ogren

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The benefits of added organic matter to the soil have long been known and are usually attributed to increased nitrogen, greater water−holding capacity and an increase in activity of soil earthworms and microbes. But experiments have shown that the increase in carbon dioxide (CO2) release that accompanies added organic matter is certainly one of the main reasons why adding organic matter to the soil increases plant growth.
Greenhouse owners have long understood that plants consume CO2 and release oxygen. In a greenhouse packed full of plants, through the process of photosynthesis, the plants can quickly use up most of the available CO2 and then their growth slows down or stops. To compensate for this, old time growers used to place boxes or flats of fresh manure underneath their greenhouse benches. As the manure decomposed it released CO2 into the greenhouse air and the plants grew faster as a result.
In today's modern greenhouses, especially those with concrete floors, lack of CO2 is always a concern. Most of the newer greenhouse ranges are now equipped with automatic CO2 regulators that monitor the amount of CO2 in the air inside the greenhouse and then release more as needed.
In these greenhouses with their gas growth CO2 generators the plants don't just grow bigger−− they also mature earlier.

So, what has all this to do with global warming and allergies?

As we become more and more reliant on burning petroleum products and as our global temperatures continue to rise, carbon dioxide levels in our air are rising. Before the last election we in the US had assumed, incorrectly, that no matter which candidate won the election, new controls were going to be placed on CO2 emissions.
We know better now.
The US with its huge consumption of fossil fuels, (the U.S. produces nearly 25 percent of man−made carbon dioxide emissions worldwide). also is experiencing the greatest increase in CO2. Actually, CO2

accounts for 80−85 percent of the heat trapping (greenhouse) gases contributing to global warming.
The idea that is now called the "Greening Theory" holds that all this extra CO2 is good. It will result in increased plant growth and thus in resulting increases in food supplies. There is some merit to this theory but there are numerous downsides too.

Pollen−Allergies
There are many negative effects from global warming but let's just consider one here, pollen production and it's affect on allergies.
Since 1959 allergies have dramatically increased in the US from 2 to 5 percent of the population affected, to a whopping 38 percent now.
Largely because of the huge horticultural "success" of the much over−simplified theory of "litter−free" landscaping we already have vast urban landscapes that are heavily loaded with wind−pollinated

dioecious male cultivars (clones) of trees and shrubs. These modern landscape trees result in surrounding air with unnaturally large amounts of allergenic pollen. Because the "messy" urban female trees are now so rare, almost none of this pollen is now trapped, removed from the air and turned into seed. (Female trees produce no pollen, ever, but they do make seeds, pods, and fruit.)
We have tidy sidewalks but pollen−filled air.
Under normal carbon dioxide levels these male cloned trees will always produce abundant amounts of pollen. Under increased levels of carbon dioxide, they produce considerably more. The increase in temperature itself also results in increased pollen production, and in pollen production that starts earlier in the spring and lasts further into the fall. There is research that shows that under stress conditions male plants are able to take up more water than are females. Under stress conditions, such as drought, male trees are also able to hold onto the water they already have better than are female plants.
Where there are abundant water and soil nutrient sources the increases in carbon dioxide levels in our air will result in larger urban trees, which if they're allergy trees, will be capable of producing ever more pollen.
Increases in carbon dioxide increase plant growth but only if there is enough available extra water and nitrogen in the soil to support this additional growth. When the supplies of water and nutrients are not adequate to support this added CO2−induced growth interesting physiological things happen in plants. Foremost, it is an added stress on the plants and stress often results in an increase in unusual reproduction factors.

A stressed lemon tree, for example, will often produce a huge crop of tiny, very seedy lemons. This is simply the lemon tree's way of preparing for it's own imminent demise and also it's own legacy of possible seedlings.
Another stress example: In daily pollen collections taken by biology professor Dr. Lee Parker and his students from the top of the Fisher Science Building at Cal Poly, San Luis Obispo, California, taken during the middle of a severe seven year drought, all−time record oak pollen count levels were recorded.
In the past twenty years in particular there has been a huge increase in this planting of male cloned street trees. These trees can not produce pollen until they mature but with the increases in CO2 levels, we can predict that they will mature earlier than expected.
Shannon L. LaDeau, a researcher at Duke University found that pine trees grown with elevated levels

of CO2 produced three times the normal amount of seeds and also matured prematurely.
Lewis H Ziska, Ph.D., a USDA researcher, recently found that increased CO2 resulted in huge increases in the pollen production of ragweed and other weeds.
David Karowe, a researcher at the University of Michigan, found another interesting factor about increased CO2 levels and plants: their leaves contain fewer nutrients than normal.
Nancy Tuchman, biology professor at Loyola University in Chicago, is also researching the feed value of CO2 enhanced leaves on microorganisms and insects. She found that they all grow slower when fed these "enhanced" leaves. "If all the plants are altered on a global level, then it's certainly going to affect all the organisms on Earth," she said. "No one is going to escape."
Compounding all of this is that excessive burning of fossil fuels and the resulting pollution may well be compromising our very endocrine and immune systems. Theo Colburn explored this well in the very interesting book, "Our Stolen Future."
Great increases in the already excessively high rates of urban pollen, combined with further compromised immune systems, may well be the recipe for allergies of true epidemic proportions in the not too distant future.
Dr. Robert C. Stebbins, renowned biologist from UC Berkeley, told me recently in a phone conversation, that the planting of all these cloned male dioecious and compromised monoecious trees,

"is a classic example of how they just didn't think about the ecology involved."
If we don't start paying closer attention to how we landscape our cities, and we don't start getting serious about alternative clean energy sources, rampant allergies and other pollen−related illnesses may well be the end result.

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As one who makes his living by writing about allergies and asthma I am often asked about the potential health benefits of using local honey.

Honey contains bits and pieces of pollen and honey, and as an immune system booster, it is quite powerful. I have often in talks and articles, and in my books, advocated using local honey. Frequently I'll get emails from readers who want to know exactly what I mean by local honey, and how "local" should it be. This is what I usually advise:

First, a word of warning: do not give honey to babies one year of age or younger. This therapy is recommended for older children (five and up, and adults).

Allergies arise from continuous over−exposure to the same allergens. If, for example, you live in an area where there is a great deal of red clover growing, and if in addition you often feed red clover hay to your own horses or cattle, then it likely you are exposed over and over to pollen from this same red clover. Now, red clover pollen is not especially allergenic but still, with time, a serious allergy to it can easily arise.

Another example: if you lived in a southern area where bottlebrush trees were frequently used in the landscapes or perhaps you had a bottlebrush tree growing in your own yard, your odds of over−exposure to this tree's tiny, triangular, and potently very allergenic pollen is greatly enhanced.

In the two examples used above, both species of plants are what we call amphipilous, meaning they are pollinated by both insects and by the wind. Honeybees will collect pollen from each of these species and it will be present in small amounts in honey that was gathered by bees that were working areas where these species are growing. When people living in these same areas eat honey that was produced in that environment, the honey will often act as an immune booster. The good effects of this local honey are best when the honey is taken a little bit (a couple of teaspoons−full) a day for several months prior to the pollen season.

When I'm asked how local should the honey be for allergy prevention I always advise to get honey that was raised closest to where you live, the closer the better since it will have more of exactly what you'll need.

It may seem odd that straight exposure to pollen often triggers allergies but that exposure to pollen in the honey usually has the opposite effect. But this is typically what we see. In honey the allergens are delivered in small, manageable doses and the effect over time is very much like that from undergoing a whole series of allergy immunology injections. The major difference though is that the honey is a lot easier to take and it is certainly a lot less expensive. I am always surprised that this powerful health benefit of local honey is not more widely understood, as it is simple, easy, and often surprisingly effective.

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