

bers were small, the researchers noted that, together, these results lend support to "the hypothesis of EMF acting on hormonal-dependent organs."

According to *Microwave News*, the Floderus study is the fifth to link occupational EMF exposure to male breast cancer. The authors of the first study say that there is less data on breast cancer in women who work in electrical jobs, but point out that this is most likely due to the small percentage of women who work these types of occupations.

Tree of Life

For thousands of years, the people of India have known about the powers of the neem tree. They clean their teeth with neem twigs, heal skin disorders such as ulcers and eczema with neem-leaf juice, drink neem tea as a tonic, place neem leaves in their grain bins and cupboards to ward off insects, and pour neem tea on their plants to repel insects.

Now scientists around the world are researching the possibilities that the neem, a member of the mahogany family, could provide answers to many global problems such as including reforestation, cancer prevention methods, pesticide alternatives, and population control, including a role in the development of a male birth control pill.

"Even some of the most cautious researchers are saying that neem deserves to be called a wonder plant," according to Noel Vietmeyer, the study director of a 1992 National Research Council report entitled "Neem: A Tree for Solving Global Problems."

Indian scientists began research on the neem in the 1920s, but their work was little recognized until a German entomologist, Heinrich Schmutterer, witnessed a locust plague in the Sudan in 1959. Schmutterer began researching the neem when he saw that the only plant survivors of the plague were neem trees. Interest in the tree spread, and by 1991, several hundred researchers in over a dozen countries were conducting research on the neem. The U.S. Department of Agriculture has been studying the neem tree since 1972.

One of the most promising benefits of the neem tree may be the use of neem extractions in new organic insecticides. According to the World Health Organization, over



The giving tree. The neem tree may provide answers to some of the toughest environmental and health questions.

20,000 deaths and a million illnesses each year result from misuse or overuse of pesticides in the Third World alone. Neem insecticides have many advantages over traditional chemical methods: research indicates they are not harmful to humans or animals, insects don't become resistant to them, neem extracts do not accumulate in the environment, and they also spare beneficial insects like butterflies and ladybugs.

Entomologists have found that neem compounds can affect more than 200 insect species, including mosquitoes, fruit flies, head lice, Japanese beetles, Colorado potato beetles, Gypsy moths, fire ants, fleas, cockroaches, and boll weevils. The neem serves as a unique insecticide in that its compounds do not immediately kill insects, but rather alter insects' behavior or life processes in subtle ways as to impair the insect so that it can no longer feed, breed, or metamorphose.

The chemical structure of the neem con-

tains only carbon, hydrogen, and oxygen, in contrast to inorganic, synthetic insecticides. The neem relies on four major compounds which act as anti-hormones in combating insects, and these are backed up by some 20 or so other minor, less active compounds.

The four major compounds, azadirachtin, salannin, meliantriol, and nimbin, are of the general class of natural products called triterpenes, or more specifically, limonoids. Azadirachtin is the major agent for warding off insects, causing about 90% of the effect on insects. It repels and disrupts the growth and reproduction of insects by interrupting the process of metamorphosis by blocking molting, thus ending the insect's life cycle. Meliantriol and salannin both repel insects by causing them to cease eating. The fourth compound, nimbin or nimbidin, is involved in antiviral activity, affecting potato virus X, vaccinia virus, and fowl pox virus. Other neem ingredients also work as antihormones, including some that are able to paralyze certain insects' swallowing abilities.

It is a fairly simple process to obtain these compounds by extracting them from the seed kernels of the tree. Crushing the kernels and extracting them with water is the most effective way for village peoples to obtain neem insecticides. Scientists have developed more advanced

processes and means to convert neem extracts to forms of granules, dust, wettable powders, or emulsifiable concentrates. Scientists have also developed formulations, including the addition of chemicals or chemical modification of the neem ingredients, to increase shelf life of products or to reduce phototoxicity, the damage to sensitive plants.

There are currently four neem-based insecticides available on the U.S. market. AgriDyne Technologies, Inc. manufactures Azatin, Turplex, and Align. Azatin, which was introduced in 1992, is produced for use on ornamental plants, such as greenhouse plants and flowers. Turplex, also introduced in 1992, is used for turf and lawn care, while Align was introduced last year for use on food crops. W.R. Grace manufactures Margosan-O, which is now registered in all 50 states, also for use on food crops. The EPA has approved the use of both Align and Margosan-O for food crops. According to

John Cuomo, the director of chemistry research at AgriDyne, the products have been accepted very well by growers, and the company continues to receive many requests for the products.

Although the neem seems to have endless possibilities, there are some disadvantages that need to be overcome. According to the NRC study, "the truth is that despite all its properties and promise, some impediments must be overcome and many uncertainties clarified before neem's potential can be fully realized." For example, neem products sometimes degrade and lose their pest-control properties when exposed to sunlight. This has been mitigated in some U.S. products by the addition of sunscreen. Cuomo said that the AgriDyne products do not contain sunscreen because it is not necessary for them to be effective. On a positive note, he said because of the UV breakdown and the hydrolysis of the neem products, they decompose rapidly, preventing buildup in the environment.

Although there appear to be few adverse human health effects of neem ingredients, further toxicity tests need to be conducted. Toxicity tests on fish and other wildlife also require investigation. Another disadvantage of the use of neem insecticides is that they kill insects by delayed action, so they work slower than synthetic pesticides. Consumers who have become accustomed to instant results may be impatient with the slower action of neem insecticides. Cuomo said that although AgriDyne's products are slow-acting, they are very effective if used for a full season.

Perhaps one of the greatest advantages of the neem is the fact that its fruits may be harvested without destroying the tree, making the neem more profitable standing than felled. As stated in the NRC report, "the use of neem products has the merit of promoting a greening of the earth."

Asthma Gene Is Nothing to Sneeze at

Approximately 5,000 people, many of them children, will die of asthma this year.

Scientists have long known that allergic reactions to environmental irritants such as dust, pollen and other allergens, air pollution, and cigarette smoke trigger asthma attacks. They have now identified a gene that may contribute to susceptibility to asthma attacks by telling the body to overproduce a receptor for immunoglobulin E (IgE), an antibody involved in allergies.

Researchers led by William Cookson of John Radcliffe Hospital and Julian Hopkin of Churchill Hospital, both in Oxford, England, presented the new research in the June issue of *Nature Genetics*. When IgE binds to a protein receptor in cells lining the airways of the nose and chest, it sets off a series of events leading to an allergy attack. The gene found in the study contains the information for making part of the IgE receptor. The researchers found that people with a particular variant of the gene were likely to have high levels of IgE in their blood, an indicator of a tendency to allergy attacks. The researchers studied 60 families in which 10 had at least one person who had inherited both the variant and the allergic reaction. Of the 12 children who had the variant, all had allergic reactions, compared to only 2 of the children who did not inherit the variant.

The researchers stressed that the association was found only in a minority of the families, and that other genes may be implicated in asthma as well. Still, in an article by the Associated Press, Marshall Plaut, chief of the asthma and allergy branch of the National Institute of Allergy and Infectious Diseases, said, "I think they might have at least a partial answer, and it could be very important."

Any answers as to how and why people develop asthma would be good news to the 12 million Americans who suffer from it. But answers to these questions alone will not stop the increasing rates of asthma, which has become a major environmental health threat, particularly among inner-city children who are more often exposed to allergens and air pollution and may be especially sensitive

to them. Misdiagnosis, mismeasurement or lack of treatment, and lack of the means to remove environmental contributors to asthma are common in inner cities. Answers to these problems are also needed to prevent the increasing numbers of childhood deaths from asthma.

Recent studies sponsored by NIH and the National Center for Health Statistics (NCHS) show that African-American children who live in urban areas are more likely to develop asthma than white children who live in the suburbs and more likely to die from it due to a lack of diagnosis or treatment. In an article in the *Washington Post*, epidemiologist Diane Wagener of the NCHS said, "Deaths due to asthma among children should not happen, because it's a preventable situation." Public health officials say that although genetic research may help to identify individuals who may be susceptible to developing asthma, without adequate prevention and treatment measures the information has little worth.

Making Headlines on Health

In a recent statement, David Satcher, director of the Centers for Disease Control, criticized the news media for giving too much coverage to attention-grabbing health-related stories and not enough to less sensational, more substantive issues. In October more than 400 environmental journalists gathered in Utah, in part to examine this and other complaints about their profession.

Speaking at the plenary session of the 1994 Annual Meeting of the Society of Environmental Journalists, Jim Detjen, an editor at *The Philadelphia Enquirer* and the former president of SEJ, said, "The line is becoming increasingly blurred between what is news and what is entertainment." Detjen cautioned his colleagues that the current focus on "telling stories" erodes the credibility of the press and detracts attention from serious environmental and health issues. Detjen's observations were echoed by other members of the plenary panel including Thomas Winship, chair of the Center for Foreign Journalists and a former editor of *The Boston Globe*; Noel J. Brown, special representative of the executive director of the United Nations Environment Programme; and F. Sherwood Rowland, winner of the 1983 Tyler World Prize in Ecology and Energy for his discoveries of the depletion of ozone by chlorofluorocarbons and the 1987 Award for Creative Advance in Environmental Science and Technology. Panelist Erin Hayes, a correspondent for ABC News in Chicago, advised journalists to avoid the danger of overdramatizing stories just to make them sexy enough to get on the air or in the paper. Said Hayes, "Environmental stories

Asthma Facts

- Asthma affects as many as 15 million persons in the United States.
- After hay fever, asthma is the most frequent chronic condition in persons under age 18. Nearly 5.1 million Americans under age 18 have asthma.
- Asthma was the underlying cause of 5,106 death in the United States in 1991 and the number is growing.
- Blacks with asthma are about three times as likely to die of asthma as are whites. Inner city black children are more likely to develop asthma than white children in suburban areas, and are less likely to receive treatment.
- The 1991 National Center for Health Statistics National Hospital Discharge Survey indicates that asthma was the first-listed diagnosis in 490,000 hospital admissions.
- In 1990, the cost for treatment of asthma was estimated at \$6.2 billion. Forty-three percent of asthma's economic impact was associated with emergency room use, hospitalization, and death.

Source: National Institute of Allergy and Infectious Diseases