Science versus the dust mite

The increase in asthma and related respiratory complaints in Australia has reached alarming proportions. While looking for a cure is keeping medical and other professions busy, CSIRO scientists are taking other tacks.

Dust mites are a major cause of allergic responses and the conditions under which they thrive are well understood. But the University of Sydney's Department of Medicine recently asked CSIRO for information about the microclimate and materials in Australian houses and their relationship to high mite levels.

According to CSIRO Division of Building, Construction and Engineering researcher Ivan Cole, dust mites enjoy near-perfect breeding and living conditions in many parts of Australia: at least 70% humidity and moderate temperatures.

'In the Northern Hemisphere, if humidity falls to below 40%, the mites dehydrate and when summer comes there are so few left that there isn't a population explosion,' Cole says. 'In Denmark they've taken this natural occurrence and prolonged it by developing special ventilation and heat-recovery systems which reduce humidity to below 40%. But the technology is expensive, and may not be practical in Australia, where the outside humidity is not much lower than inside anyway.'

Cole says the local microclimate needs to be studied in detail before dehumidification schemes suitable for Australian conditions are developed.

Another researcher at the division, Steve Brown, is investigating dust mite levels in different types of carpet and buildings. He says limited studies overseas have shown that mite levels are much lower in some carpets, but the factors involved, such as carpet pile, fibre type and insecticidal treatment, are poorly understood.

'We want to assess these factors by combining laboratory experiments and field surveys of buildings,' Brown says. 'We know that in any location, different buildings can vary enormously in their levels of house dust mites. If we can identify those factors of building design or material selection that lead to low mite levels, these can be used for mite control in future buildings.'

Dust mites will probably never be wiped out altogether. Even if they were, there would be a risk that a pest we liked even less might take their place. Cole and Brown say a realistic goal would be to reduce the dust mite population from tens of thousands a square metre to hundreds.

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Making sense of the weather

Metaccess, a weather analysis software package developed by Dr John Donnelly and colleagues at the Division of Plant Industry, represents a breakthrough for farmers, land managers and the agricultural futures market.

The package, which costs less than $500, provides access to daily weather data and allows users to estimate the likelihood of specified weather patterns or events at any location, based on past experience. This means sporting bodies can be reassured that the picnic race meeting is less likely to be rained out and farmers can assess the odds of continued drought or choose the best period for harvest.

Flexible and easy to use, Metaccess runs on IBM-compatible personal computers. It displays menus and dialogue boxes that enable the user to select locality of interest, information required and type of display.

Metaccess, marketed by Horizon Technology, can analyse weather records for up to 18 elements including rain, evaporation, temperature, wind, thunderstorms and frost. It can be used to help select pastures and crop varieties that suit local weather patterns and to help regional and local authorities develop policies to cope with climate extremes such as drought, before they occur.

Weather records collected by the Australian Bureau of Meteorology are included as data in Metaccess. The program also allows users the opportunity to enter weather records from other sources.

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With Metaccess, farmers can estimate optimum harvest periods or the likelihood of continued drought.