Scientist: Pesticide harm overstated

University of Massachusetts Professor Karl H. Deubert, believes much of the uproar over pesticide residue is unfounded and that "proper use of pesticides on golf courses will cause no harm at all to groundwater.

"Modern analytical equipment can detect even smaller amounts" than the 0.01 to 1.0 parts per billion of pesticde residues found in groundwater, he says. "At this level, the accuracy of the quantitation is questionable.

"Precautionary measures must be taken by analysts to assure that the data are qualitatively and quantitatively correct.

"Otherwise it can happen that 'pesticide residues' are detected in soil samples taken nearly 100 years ago and stored in sealed jars," he said.

"The reason for the excitement about these residue levels is difficult to understand when we may find, in most areas where chlorination is used, up to 1,000 times more chloroform in drinking water (83 ppb U. S. average) than pesticide residues where they are detectable.," Deubert says.

He said there is as little proof that these residue levels may be injurious as there is proof that they may not be.

"The word 'pesticide' conjures up all sorts of speculation called potential danger," he said. "This does not mean that pesticides are harmless. In concentrated form, they are as toxic as any other chemical."

He said that Dr. Bruce Ames (whose Ames Test determines the potential, carcinogenic hazard of chemicals) suggested to rank carcinogenic hazards according to exposure of humans and carcinogenicity to rodents.

Based on Ameses' estimates, the possible hazard of PCBs, DDT and EDB ranks lower than that of cooked bacon, peanut butter and beer containing natural, in contrast to synthetic, carcinogens, Deubert said.

"Unfortunately, despite the absence of supporting data, the general public believes that cancer in humans is caused by synthetic chemicals, pesticides in particular," he said.

"Chemical compounds break down in the ground to simpler compounds. The breakdown process can be slow (such as with plastics and DDT), or it can be rapid (as with most modern pesticides), depending on the nature of the chemical in question. Microorganisms are primarily responsible for the degradation of pesticide residues.

Therefore, they generally break down faster in aerated, warm and most soils with a good supply of organic matter, than in cold, wet and compacted soils without vegetation. For practical purposes, breakdown takes place in and above the root zone.

"Chemicals are intercepted in their movement by soil organic matter and clay. Adsorption on organic matter can be very weak (dicambas) or strong (DDT).

It stands to reason that weakly adsorbed compounds have a better chance to move in the ground than other compounds."

"Breakdown and adsorption determine the persistence of a chemical." Deubert adds.

"Modern pesticides are less persistent (1to16 weeks half-life) than the older ones (up to 8 to10 years half-life).

They generally break down or are intercepted by soil organic matter before they have a chance to reach the groundwater table.

"Most pesticide residues in groundwater are found in areas with intensive agricultural production," he says.

"Where chemicals are used on a large scale, the root mass is relatively small, and where the groundwater is shallow, contamination may occur.

"To reduce the risk of groundwater contamination, one should use the right chemical in recommended amounts and avoid spills. Users should keep book on any chemicals used, data, amounts, treated area (location and size), for their protection (the label is the law)."

Low spots with high groundwater table may be vulnerable to groundwater contamination, although they not necessarily have to be vulnerable)," Deubert says, adding, "Unfortunately, there are no black and white situations."