

FUTURE DIRECTIONS IN URBAN ENTOMOLOGY— INTRODUCTION

DONALD H. DEVRIES
DowElanco, Letcombe Regis, UK

A GLANCE AT THE PAST

In order to properly discuss the Future Directions in Urban Entomology, it might be appropriate to first take a quick glance at the past. How far back does one go? Do we go back to the stone age where we see what pest problems ancient man had to contend with? It does not take much of an imagination to envision the fleas, lice, mosquitoes and ticks that ancient man had to share his cave with. Even if we move forward several thousand years to the Medieval Period the insect problems would not have changed all that much. These people still had to deal with the problems of living in filthy crowded conditions where they were infested with human fleas, and head and body lice. Living in close association with their animals would expose them to being bitten by dog and cat fleas not to mention the Oriental rat flea which would carry the dreaded plague. It is estimated that over 25 million people were killed by the Black Plague in the 14th Century. Millions more were killed by insects spreading other diseases such as Typhus, Cholera and Malaria. Moving into the 20th Century we find ourselves being bothered by many of the same insect pests as our forefathers. However, the advancement of civilization has also allowed us the luxury of being concerned by less life threatening problems such as the mere unpleasantness of the thought of having "creepy crawly" insects living with us or destroying the structure that we now call our home. It is this unpleasantness that has generated the need for controlling insects such as cockroaches, termites and ants, thus leading to the modern era of professional pest control.

In the early days of professional pest control the emphasis was on just that, i.e. pest control. The advent of synthetic insecticides made it very easy to apply and eliminate insect pest infestations. The use of insecticides resulted in the saving of millions of lives from insect borne diseases. However, in the early days little was known or understood about the environmental consequences or chronic toxicity of these early insecticides. In the area of urban insect control these new insecticides were treated and used like a magic wand. The pest control technician only needed to enter a structure with one of these new products, spray them around and the insects would disappear. The insecticides used for these applications came as spin-offs from the agricultural industry. Chemical companies would simply take an insecticide developed for use on crops and see if it had a use for urban insects. Few universities had special departments or research programs to study urban entomology. No attempt was made to study the biology of these urban pests, nor determine ways to control them without the use of insecticides. Universities, government authorities and chemical companies worked independently with almost no co-operation between their research efforts.

A VIEW OF THE PRESENT

Over the past two days of this conference you have seen how things have changed today in the area of urban entomology. One of the biggest changes is in the spirit of co-operation that now exists between universities, government agencies and private industry researchers. Many universities now have separate departments or divisions for research in urban entomology. Several have even established special centers for research on urban pests. Many chemical companies have established special divisions for research, development and sales specifically for non crop urban insect pests. These university, government agency and industry researchers can join together to do joint research projects and also to sponsor scientific conferences to share the results of their findings.

Much has been learned about the biology of urban insect pests. Knowledge of the biology has allowed researchers to develop methods to target their control. For example, knowledge of cockroach harborage and foraging behavior has helped to understand that crack and crevice applications of insecticides is much more effective in controlling cockroaches and less environmentally stressful than simply treating all exposed surfaces. Knowledge of the pest behavior has taught us that integrated pest management can be used to help in pest control. Exclusion and sanitation are just as important as the proper use of insecticide. Use of the same insecticide over and over can rapidly result in the insect population developing resistance to that insecticide. Research has shown that rotating between different insecticide classes can help delay or avoid this resistance. Knowledge of insect biology and biochemistry has led to some new methods of insect control. Insect growth regulators such as Juvenile Hormone Analogs and Chitin Synthesis Inhibitors are the direct result of understanding the function of these insect systems. The knowledge of insect pheromones has led to the ability to control or manipulate insect pests by their behavior.

Many advances have also been made in the area of insecticide chemistry. New classes of insecticides have been developed which are less prone to accumulate in the environment and are also much less toxic to non target organisms. New types of formulations have been developed which are specific for use in urban environments and for urban pests. Microencapsulated formulations can protect the insecticide from the environment and vice versa. The use of baits can ensure that the insecticide is delivered specifically to the target pest.

A VISION OF THE FUTURE

What can possibly lie ahead? A Vision of the Future is the subject of the remainder of this symposium.