FORMULATIONS AND APPLICATION OF MICROBIAL INSECTICIDES

PREFACE

C. M. Ignoffo [1/] and L. A. Falcon[2/]

Presented herein is the second of a three-part symposium series which was planned to review and evaluate 3 major factors contributing to the total efficacy of field-applied entomopathogens, i.e. (1) the original activity or virulence of the entomopathogen, (2) coverage of the entomopathogen on the target site, and (3) persistence of the entomopathogen on the target site. The first symposium, "Stability of Microbial Insecticides," (at the Annual Meeting of the Entomological Society of America at Minneapolis, Minnesota, in 1974), reviewed the effects of sunlight, temperature, humidity-water, substrate, pesticides and adjuvants on field-applied protozoa, fungi, bacteria, and viruses (Ignoffo and Hostetter, 1977). This symposium deals with coverage of the target site through formulation and application technology as a means of increasing efficacy of entomopathogens.

Formulation and application technology of entomopathogens has been largely neglected in the past (Ignoffo, 1972). Scientists, familiar with this field, feel that inadequate coverage of the target site is a major factor contributing to reports of failure of entomopathogens to control or suppress insect pests. This symposium addresses that problem.

The primary objective of future research in industry as stated by T. L. Couch is to "develop a formulation with physical and biological characteristics which will permit disposition of the majority of the emitted spray on the target site." In many cases it appears that less than 10% of the microbial agent actually reaches the target site. In his report on use of microencapsulation, D. L. Bull concludes that "encapsulation of virus (*Heliothis* NPV). . . . . produces formulations remarkably resistant to solar irradiation. . . . ." and that "properly timed applications can maintain control of moderate infestations (of *Heliothis*) at levels equivalent to . . . . conventional insecticides." In the review of application of microbial insecticides on field crops, W. C. Yearian and S. Y. Young conclude that no one set of conditions may be optimal and that "Each situation should be judged separately and the crop, host insect, . . . and characteristics of the microbial, must be considered." The use of microbial insecticides to control forest pests poses a more unique problem for solution. In their review, J. A. Neisess and H. B. Hubbard discuss the problems that have developed with formulations of bacteria and virus, and review attempts to correlate extent of coverage with biological activity. In the last paper of the symposium, D. B. Smith, D. L. Hostetter, and C. M. Ignoffo suggest establishing

[1]Biological Control of Insects Research Laboratory, U. S. Department of Agriculture, Agricultural Research Service, North Central Region, Columbia, MO 65201.

[2]Division of Entomology and Parasitology, University of California, Berkeley, CA 94720.