

Foreword

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All of us are aware that insects and other arthropods are capable of inflicting serious losses to crops and livestock and that actions to prevent losses are frequently necessary. An integrated pest management approach in which multiple tactics, often including conventional pesticides, may be used is generally accepted as the preferred way of dealing with pests. However, as conventional chemical pesticides become less acceptable, biological controls will be used increasingly in integrated programs to suppress pest populations and prevent pest outbreaks. Although many biological products have been marketed for decades, up until now the role of this class of products has been limited. But there are a number of environmental and human health concerns associated with conventional pesticides that are favoring biological or biorational products. These concerns include riparian, soil, and ground-water contamination; adverse effects on nontarget species, including endangered species; undesirable pesticide residue levels in food, with a major focus on dietary exposure in children; and worker safety associated with both short- and long-term exposure. Other issues favoring biologicals include reduced performance of conventional insecticides in the field caused by the development of resistance; the loss of materials because of the economic cost of re-registration; and the increased cost of development, registration, and labeling of new conventional pesticides. Consequently, the numbers of research and development activities related to biological pest