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The Unrealistic IPM Parameters Of Vertebrate Pest Control

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In actual practice certain phases of integrated pest management (IPM), i.e., the utilization of a multitude of control methods, have always played a role in vertebrate pest management. For example, sanitation and rodent-proofing have always been viewed as most important aspects of rat control. IPM is a necessity in vertebrate pest control because total dependence on lethal chemical-control methods is not possible with many animal pest problems. Toxic chemicals, when used alone, are often not sufficiently effective as a single management practice.

While a wide variety of control techniques and methodologies are used in resolving animal damage problems, we have been remiss in not developing and promoting adequate schemes for monitoring the populations of many vertebrate pests and in not formulating more systematic control strategies for they, too, are an integral part of the IPM concept.

Integrated pest management can be carried much further in the field of vertebrate pest control, but we must avoid formulating control strategy using unproven control methodology as promoted by those not well versed in animal damage control. We must take a hard look at past experiences, especially when considering the introduction of predators and diseases to regulate vertebrates. The ecological and environmental consequences of introducing uncontrolled exotic life into the ecosystem can have far-reaching and devastating effects. Past history has shown that some predator introductions have been more destructive than the most flagrant misuses of vertebrate control pesticides would have been.

We must guard against "following the leader" and emulating the entomologist, for many of their principles and parameters are not applicable to vertebrate pest control problems. When a wildlife damage specialist or IPM specialist (who is often a professional entomologist) attempts to apply entomological IPM principles or parameters to animal damage problems, the results can sometimes be disastrous. Many of the parameters used by entomologists in establishing IPM programs for specific crops cannot be applied to vertebrate pests because they have a much longer life cycle than invertebrates. Such attempts lead to erroneous and sometimes counterproductive conclusions.

The establishment of rigid economic thresholds or economic injury levels for many vertebrate pests is very difficult, if not impossible, because it will vary not only with the crop, but depends on the time of year, proposed method of control, and the planting cycle of the crop. For example, the density of pocket gophers that will be tolerated in a newly planted alfalfa field will be much less than in the last year of production just before the field is to be plowed.

Vertebrate pest chemicals are even directed toward individual animals, because it is often the most practical solution to a problem. It is also generally most economical to control populations at their lowest level, thus the economic threshold, at times, may be only one animal. Control by hand-baiting of a few pocket gophers in a newly planted alfalfa field, or just
prior to planting, is an example.

When calculating cost-benefit ratios for some types of vertebrate control, it must include the life span of the animal, or the density of the population that will exist throughout the life of the crop, and not just the economic savings for a single crop season. For example, to control pocket gophers in a newly planted alfalfa field may have benefits which will project over the entire life of the field, i.e., for 4 to 6 years.

Depending on past crop production experience or other history about a particular pest problem in a given region, preventive control may be both economically and environmentally sound. As an example, it is best to control meadow mice living along a ditch before they can move into a developing adjacent crop. Pocket gophers are best controlled on fallow land before a fruit orchard is planted. Because of seasonal differences in bait acceptance, it is often necessary in the Far West to control ground squirrels in the late spring or fall after they have done most of their damage for that season, knowing that the major benefits of the control will not be capitalized upon until next year.

Other aspects which are sometimes not taken into account include the fact that vertebrate pests are often highly mobile and not host-specific and will often go from one crop to another. They are not usually influenced as critically by weather as are insects.

Introduced predators of rodents and rabbits have never been dramatically successful. Because such predators are not species-specific, the introduced predators often do far more harm than good.

The introduction of diseases for pest animal control has been fairly successful in only one instance—the use of myxomatosis virus for the control of the European rabbit. Using diseases, which usually are not species-specific, to control animal populations has in the past resulted in human and domestic animal fatalities.

The principles and parameters used in IPM programs for vertebrate pests differ substantially from those of other crop pests such as insects, diseases, and weeds. Understanding these differences is essential if vertebrate pest IPM programs are to be effective and practical.