

# Ask The Expert

*Editor's Note: How often have you been faced with reading or hearing a topic that sounds interesting but do not quite understand some of the details. We have selected such a question and have had an expert on the topic provide an answer.*

## **QUESTION:**

**What is integrated pest management?**

## **RESPONSE:**

A pest is defined as any organism judged to be a threat to humans or to their interests. Pests include certain insects, plants, animals, and pathogens. Integrated pest management is the coordinated use of tactics to maintain pest damage below economic levels while minimizing hazard to humans, animals, plants, and the environment. Effective integrated pest management programs rely on information and knowledge of the 1) biology and ecology of the pest, 2) biology and ecology of the host or plant community affected by the pest, 3) causes of pest invasion, 4) tactics available to manage the pest, and 5) benefits and risks of the integrated pest management strategy to agriculture and society. Preventing pest dispersal into new habitats and early detection of the pest invasion are critical to successful pest management programs.

Once a pest is discovered, there are several steps to developing an integrated pest management program. First, accurately identify the pest. Second, investigate and understand the biology and ecology of the pest and host or plant community. Third, conduct a survey to quantify the level of pest infestation. Fourth, determine if the pest is sufficiently abundant to require action. Fifth, evaluate available control tactics and select those that, when applied in the appropriate sequence and combination, yield the desired result. Sixth, continue to monitor and evaluate the pest population after the integrated management strategy is implemented and make adjustments as necessary to increase pest management efficacy.

On rangelands, unwanted plants or weeds tend to be the most common pests. Tactics to manage rangeland weeds include biological, cultural, mechanical, and chemical control technologies. Biological control of weeds is the planned use of living organisms to reduce a plant's reproductive capacity, abundance, and impact. Biological control can involve conservation, augmentation, or importation of natural enemies.

Conservation involves manipulating the environment to enhance the effect of existing natural enemies of the weed. Augmentation is the repeated release of natural enemies and is usually restricted to managing weeds in high-value food crops because it requires large investments of time and money. Importation, also known as classical biological control, is the planned relocation of natural enemies of exotic or nonindigenous weeds from their native habitats onto weeds in habitats they invade. This strategy seeks to reestablish weed and natural enemy interactions that reduce the weed population to a desired level. Cultural practices include fire, grazing, revegetation or reseeding, and fertilization. These methods are aimed at providing a barrier to weed invasion by enhancing desirable vegetation. Mechanical treatments involve either removal of the aerial portions of the weed or removal of enough of the root and crown to suppress the plant. Chemical controls involve the application of pesticides to manage pest populations. Herbicides to control unwanted plants are probably the most commonly used pesticides on rangelands. Herbicides are classified according to their chemistry and mode of action and are usually selectively phytotoxic within certain rates of application, environmental conditions, and methods of application. Foliar-active herbicides are applied directly to the leaves or stems of plants, where they are absorbed and translocated within the plant. These herbicides may or may not remain active once moved into the soil. Soil-active herbicides are absorbed by the roots from the soil water solution and have a phytotoxic affect on susceptible plants. A successful and sustainable integrated pest management strategy involves careful consideration, selection, and application of appropriate control tactics in a mutually supportive manner that enables land management objectives to be met.

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*Dr. Robert Masters, Dow AgroSciences LLC, Lincoln, Nebraska;  
E-mail: ramasters@dow.com*

*If you have a question on a topic, please send a short note to: Rangelands Editor-in-Chief, 7820 Stag Hollow Rd, Loveland, Colorado 80538, or e-mail: gfrasier@aol.com. If selected, we will attempt to locate an expert for an answer and publish it in a future issue of Rangelands.*