

Handbook of Toxic Plants of North America

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Handbook of Toxic Plants of North America. George E. Burrows, and Ronald J. Tyrl, Blackwell Publishing, 2121 State Avenue, Ames, Iowa 50014, USA. 2006. 307 Pages. ISBN 0-8138-0711-5. \$89.95 U.S. (paperback).

Review by Larry D. Howerly

When livestock or companion animals suffer the consequences of ingesting toxic plants, one of the first steps for managers or caretakers is to do some investigative detective work to determine the likely cause of toxicity or death. Such a task can be daunting considering there are more than 1,000 plant species that have been documented to be toxic to livestock in the United States and Canada. If you have experienced the difficult and complex process of attempting to deduce the cause of intoxication or death after an animal has ingested a toxic plant, the *Handbook of Toxic Plants of North America* by George E. Burrows and Ronald J. Tyrl may be for you.

This reference handbook provides a tool for managers to diagnose poisonous plant maladies by examining the primary symptom(s) exhibited by animals who have ostensibly ingested a toxic plant or plants. Hence, the unique feature and selling point of this handbook is that it addresses toxic plant problems largely from the perspective of the salient symptoms exhibited by the animal in question. The handbook's scope includes toxic plants that grow in natural environments across North America that can potentially cause toxicosis in livestock and companion animals. The combined expertise of a veterinary toxicologist (Burrows) and a botanist/taxonomist (Tyrl) gives the handbook a unique flavor.

The handbook is arranged in 11 chapters that describe toxic plant ailments that negatively impact the following systems/organs: blood, cardiovascular, digestive, ocular, liver, neuromuscular, reproductive, respiratory, skin, urinary, and a final chapter covering plants that can cause sudden death. Each chapter is subdivided by the clinical manifestations one might observe in an animal suffering from a particular kind of malady. The authors envision the handbook's users will be "veterinarians, pathologists, veterinary students, animal scientists, agricultural extension agents, farmers, and ranchers...that is, individuals who are likely to be the first to encounter a dead animal or one showing signs of intoxication."

Included in each chapter are detailed descriptions of the signs of each symptom related to a body system or organ, an overview of the

underlying problem associated with a toxic plant, pathology and possible treatments and prevention practices, and taxonomy and ecology of the suspected plant species known to produce the symptom, along with basic explanations of the plant's key characteristics to assist the reader in plant identification. A high-quality color photo and/or sketch are included for many of the plant species along with a shaded map depicting their general distribution across North America. Plant species are grouped into three categories (i.e., primary, secondary, and tertiary) by their degree of effect on an animal's particular system or organ. There is a botanical glossary at the end of the handbook that will help nonbotanists interpret descriptions of plant parts, and an extensive index that includes plant common and scientific names as well as keywords and phrases that are presented in layman's terms.

As an example of how this handbook might be used in the field, let's assume that you observe a horse (or some other animal) that is panting heavily or otherwise showing signs of labored breathing. Chapter 8 provides three categories of clinical manifestations regarding plants that might negatively affect the respiratory system in this way. Category III, Respiratory Distress Severe, or ARDS (Acute Respiratory Distress Syndrome) is the category that best fits the symptoms you have observed. A quick perusal of the next few pages would point you in the direction of either alfalfa or purple mint as being potential culprits that could be causing the respiratory affliction. Your detective work, however, should not stop here.

As mentioned earlier, diagnosing plant toxicosis in animals is often a complex endeavor. The authors aptly point out in the Preface that toxic plants "may affect only a single organ or system and produce a well-defined suite of clinical signs and/or pathological signs, or they may affect several different organs or systems to varying degrees and produce a plethora of clinical signs." In other words, it would behoove users of the handbook to peruse and cross-reference chapters concerning interrelated body systems and organs (e.g., respiratory vs. neuromuscular vs. cardiovascular systems) while doing their detective work. For example, numerous toxic plant species that can produce respiratory problems in animals are not listed in the chapter on the respiratory system (Chapter 8) but are instead found in several other chapters. Because all body systems and organs are to some degree interrelated, you may need to dig deep to discover the true cause of an observed malady.

In the "Use of this Book" section of the handbook, the authors correctly advise the

reader that knowing which plant species are present in a pasture or land management unit is a crucial part of rounding up the usual suspects (toxic plants) that might be responsible for an observed ill effect (or effects). Obviously, if a particular toxic plant species does not grow in the management area it cannot be implicated as a causal factor—unless it has been imported and fed to animals in hay or processed feed (e.g., pellets).

The authors also offer an “obvious caveat” that not *all* toxic plants are covered in the handbook. Recalling our earlier example of the horse with respiratory difficulties, there are other plant compounds that occur in various plant species that could, when ingested, result in respiratory distress in certain animals (e.g., glycosides in mountain mahogany [*Cercocarpus*], wild flax [*Linum*], and dogbane [*Apocynum*]; selenium in woody aster [*Xylorrhiza*], prince’s plume [*Stanleya*], and salt bushes [*Atriplex*]). I could find none of these potentially toxic plant species in the handbook. The handbook does not go into detail regarding how environmental or phenological aspects in plants, or how learning by animals, can greatly influence the level of toxicity experienced by animals across space and time.

This handbook provides a useful tool that will help livestock managers or owners of companion animals detect and diagnose problems associated with toxic plants. It will also be useful in helping one devise management strategies to avoid future problems. The handbook will be a good addition to your library if you have the need to decipher toxic plant problems by “keying out” an animal’s clinical signs of toxicity compared to the potentially toxic plant species known to grow in a particular pasture or land management unit. If you are looking for a comprehensive book that covers all toxic plants in North America, the book titled *Toxic Plants of North America* published in 2001 by the same authors may be more suitable for your needs. Owning both of these reference books along with one or two reference books that focus on the specific toxic plants in your state or local area would allow you to perform your best detective work.

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