

Sweetclover Toxicity

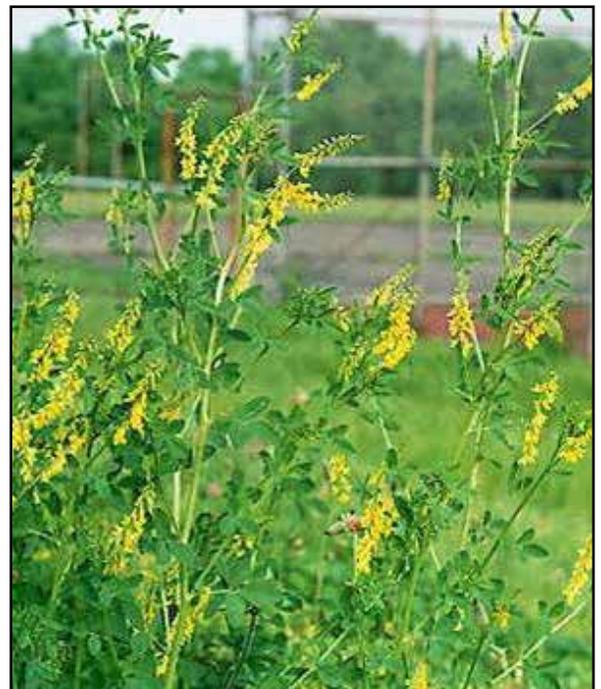
Larry C. Hollis, DVM, M.Ag
Beef Veterinarian

Deon van der Merwe, BVS, Ph.D.
Veterinary Toxicologist

Last year there appeared to be a bumper crop of yellow sweetclover (*Melilotus officinalis*) and white sweetclover (*Melilotus alba*) growing in ditches, pastures, and CRP fields across much of Kansas. The delayed arrival of spring, coupled with adequate moisture in most areas, created a favorable growing environment for these common plant species. Because of the abundance of the plants last year in areas suitable for haying, cattle producers should remember that sweetclover may have potential side effects that should be considered when haying, storing, or feeding.

Grazing fresh, undamaged yellow or white sweetclover is normally a safe management practice except for possible bloating problems when grazing immature plants. Problems with sweetclover typically occur when it is damaged or spoiled either shortly before or as it is being made into hay. A naturally-occurring substance in the plants called coumarin, which is responsible for the characteristic smell of sweetclover, is converted to a toxic substance called dicoumarin when the plant is damaged. Damage can occur before harvest by hail, drought, or frost; by improper curing; or harvest or storage conditions that allow the hay to become moldy.

Dicoumarin (the active ingredient in some rodent poisons) interferes with the synthesis and metabolism of vitamin K1. Because vitamin K1 is essential for proper blood clotting, dicoumarin toxicity problems are manifested primarily as bruising or bleeding disorders. The first noticed sign is usually bleeding from a wound or body orifices, or excessive bleeding following calving, castration, dehorning, or ear tagging. Occasionally the first signs are severe lameness caused by bleeding into joints. Young animals are more sensitive to the toxin than older animals.



White sweetclover (top), U.S. Forest Service; Yellow sweetclover (bottom), Copyright © 1997 by Janet Stein Carter. Used by Permission.

The toxin can also be passed through the milk to calves when nursing cows are fed affected hay. Because the depletion of vitamin K1 reserves in the animal's body has to occur before signs begin, the damaged or moldy hay usually has to be fed a minimum of two to three weeks or longer before initial signs appear. Toxicity is usually seen as a herd problem affecting many animals, and is most commonly seen during the winter after prolonged hay feeding. Affected hay will usually remain toxic for years.

To prevent sweetclover toxicity from occurring, it is essential that recently damaged plants not be harvested for hay. Also, the stems of sweetclover plants should be examined to make sure that they are properly cured (thoroughly dry) before being baled as hay. If conditions are right for hay to become moldy, they are right for coumarin to convert to dicoumarin.

Questionable or obviously moldy hay should be tested for dicoumarin levels before feeding. Spots and other types of discoloration on leaves and stems may indicate fungal infection. Check with your local K-State Research and Extension agent or veterinarian to see about having hay samples tested. Test the most heavily damaged or moldiest spots in the bale. If hay is found to contain toxic levels of dicoumarin and it is the primary hay supply, alternating between feeding one to two weeks of sweetclover-containing hay and one to two weeks of good-quality alfalfa hay has been found to reduce the likelihood of toxicity signs. Hay containing significant amounts of sweet clover should not be fed as cows approach calving time or to calves before surgical procedures.

References

www.vet.purdue.edu/toxic/plant16.htm

Beef Cattle Handbook, BCH-3415 Sweet Clover Poisoning

Yellow Sweet Clover @ biology.clc.uc.edu

White Sweet Clover @ www.fs.fed.us

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

Publications from Kansas State University are available at www.bookstore.ksre.ksu.edu

Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. In each case, credit Larry C. Hollis and Deon van der Merwe, *Sweetclover Toxicity*, Kansas State University, January 2011.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-2950

January 2011

K-State Research and Extension is an equal opportunity provider and employer. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Gary Pierzynski, Interim Dean and Director.