USDA United States Department of Agriculture

Illinois Grazing Manual Fact Sheet
SPECIES • POISONOUS PLANTS

Oaks

Photo by: Robert H. Mohlenbrock Hosted by the USDA-NRCS PLANTS Database

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Plant Characteristics

Quercus species: Oaks are easily recognized by their fruit, the acorn. Most oaks in the Midwest have broad blades that are shallowly to deeply cut or lobed on the margins. Some have rounded or blunt teeth or lobes and are classed as white oaks; others have bristle tips on the teeth or lobes and are classed as black oaks. Two species in the Midwest—the shingle oak (Quercus imbricaria Michs.) and the willow oak (Quercus phellos L.)—have leaves with margins that are not toothed or lobed, but entire. The shingle oak has leaves that are densely pubescent beneath.

Occurrence

Oaks are found in woodlands. Some species are restricted to dry, sandy soils; some to bluffs; some to uplands; and some to flood plain forests. Certain species have broad ranges while others have limited distribution. The shingle oak is common in parts of the Midwest. The willow oak, a Costal Plain species, has glabrous leaves, and is rare in the Midwest, found primarily in the extreme southern tip of Illinois and southeastern Missouri.

Condition of Poisoning

Oak leaves emerge from the buds in early spring and remain on the trees or on the ground below the trees through the fall and winter. Animals turned into woodlots to graze before grass becomes abundant may eat large quantities of the young leaves. Or, in seeking the young grass and other browse on the ground, they may eat quantities of old leaves with whatever else they can pick up. Small amounts of oak leaves do not seem to be injurious. But large amounts can cause severe illness, usually resulting in the death of the poisoned animal in a timeframe of two weeks to one month. In the Midwest, cattle and sheep are most often reported as suffering from oak poisoning, and the majority of cases occur in the early spring.

Control

The initial reaction to either acorns or leaves of oak trees appears to result from tannin. Later clinical signs are attributed to two toxic agents found in the leaves and in acorns—quercitrin and quercitin. Although the toxic principles are not readily water soluble, animals have been poisoned by drinking water in which oak leaves have soaked.

Clinical Signs

Anorexia, rumen stasis, constipation, rough hair coat, dry muzzle, evidence of abdominal pain, excessive thirst, and frequent urination are observed in ruminants. Feces are dry and dark-brown in color, followed by diarrhea that may be blood-tinged, and frequently there is edematous swelling in the ventral portions of the body. The pulse is rapid and weak, respirations are rapid and shallow, and there may be a brownish discharge from the nostrils. Lowered milk production in lactating animals follows subtoxic doses of acorns.

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Necropsy

Gastritis and enteritis, with a bloody false mucoid membrane forming in the intestine, are typical. Increase peritoneal and plural fluids and petechiation on the subserous tissue, kidney, and heart are constant findings. Necrosis of the proximal tubules, abundant hyaline casts in the kidney, and necrosis of the liver are observed on microscopic examination

Treatment

Supportive treatment and stimulants have been recommended. An oil-type laxative will help clear the intestinal tract and coat the inflamed mucosa. Blood transfusions, parenteral fluid, nutrient therapy, and glucocorticoids have been found helpful. Feeding calcium hydroxide reportedly prevents the development of signs of poisoning.

References

Evers, Robert A., and Roger P. Link. Poisonous Plants of the Midwest and Their Effects on Livestock, 1972. Special Publication 24, College of Agriculture, University of Illinois at Urbana-Champaign.