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Abstract
One variation of early winter storms is sleet and freezing rain. This transition between rain and snow is often very rapid and seldom is considered to be more than a short-term travel hazard. Some ice storm events can persist for several hours and deposit a significant crust of ice. Should this be considered a risk to the successful overwintering of perennial crops, such as alfalfa or other forages?

Keywords
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Crop Production

Ice storms in Iowa and thoughts about alfalfa’s overwintering success

by Stephen K. Barnhart, Department of Agronomy

One variation of early winter storms is sleet and freezing rain. This transition between rain and snow is often very rapid and seldom is considered to be more than a short-term travel hazard. Some ice storm events can persist for several hours and deposit a significant crust of ice. Should this be considered a risk to the successful overwintering of perennial crops, such as alfalfa or other forages?

The ISU Extension publication, Evaluating Hay and Pasture Stands for Winter Injury, PM 1362, addresses ice sheeting briefly. PM 1362 is available in print—call ISU Extension Distribution Center at (515) 294-5247; it is not available via the ISU Extension online publications page.

Smothering of plants when covered by ice sheets

The roots and crowns of perennial forage plants continue to respire during winter dormancy. During respiration, they are using oxygen and accumulated carbohydrate stores and releasing carbon dioxide, ethylene, and other gaseous compounds. As long as there is open porosity in the soil, these gases exchange freely during the winter months. This exchange of gases is blocked by a persistent, continuous sheet of ice cover. This condition of anoxia is similar to the physiological injury caused by extended periods of saturated soils and water logging.

Smothering of alfalfa, due to ice cover, may cause noticeable winter injury with 1 to 3 weeks of cover, and death with 2 to 6 weeks of impaired gas exchange. Ice damage is somewhat unpredictable. Rather thick layers of ice can persist for weeks or months, if the ice is porous, or alternating layers of ice and snow. If the soil

A heavy frost and freeze on a field in central Iowa (Natural Resource Conservation Service)
surface is warmer than freezing, ice will often melt sufficiently even though the air temperatures are colder.

One step toward prevention of ice sheet damage is the recommended practice of leaving 6 to 8 inches of vegetative stubble in the fall to help reduce the occurrence of solid ice sheet formation.

I am not aware of any research that has been done on attempts to alleviate damage from ice crusting. There are anecdotal reports of producers physically breaking ice crusts with chain harrows or rotary hoes. The success of these practices is unknown.

Ice can form in low or depression areas of fields where snow melt or winter rain ponds and freezes. Observations also have been made of lasting damage to alfalfa where wheel tracking on snow has caused persistent ice cover. Birdsfoot trefoil, red clover, and white clover have tolerance to smothering that is similar to alfalfa, while ladino clover is more susceptible to injury. Grasses are more tolerant than legumes to smothering and can withstand injury for up to 10 to 14 weeks.

Cold exposure of root and crown tissue and the physical freeze/thaw cycle process called heaving are more frequent causes of winter injury in perennial forages.

Stephen K. Barnhart is a professor of agronomy with extension, teaching, and research responsibilities in forage production and management.

Announcements

2005 Winter Crop Schools
by Brent Pringnitz, Department of Agronomy

The 2005 Winter Crop Schools offer agribusiness professionals and producers in-depth training on a variety of topics. By focusing on a specific management topic, students have more time to fully understand the material presented. Class sizes are limited to allow more student-instructor interaction.

For individuals preparing to take the Certified Crop Adviser (CCA) exam, these schools provide an excellent opportunity to brush up on specific topics. Each course is approved for CCA credits (see below) for those already having their certification.

Dates and locations for each course are listed. All participants must be preregistered—no walk-in registrations will be allowed. Registration is $170 for single-day courses and $270 for multiple-day courses. Registration includes meals, breaks, and materials notebook.

For questions about the 2005 Winter Crop Schools or other Agribusiness Education Programs, please contact our office at (515) 294-6429 or e-mail us at aep@iastate.edu. You can also find more information or register online at www.aep.iastate.edu.

Soybean Management (2-day course)
February 8, 8:00 a.m.–5:00 p.m.
February 9, 8:00 a.m.–3:30 p.m.
Comfort Suites, 2609 Elwood Drive, Ames
5.5 crop management, 6.0 pest management, 1.0 nutrient management

Soil Fertility and Nutrient Management (2-day course)
February 15, 8:30 a.m.–5:00 p.m.
February 16, 8:00 a.m.–4:15 p.m.
Scheman Building, Iowa State Center
10.0 nutrient management, 3.0 soil and water management

Alfalfa Production and Management
February 17, 8:30 a.m.–4:00 p.m.
Room 118, Building A, Northwest Iowa Community College, Sheldon
2.0 pest management, 0.5 nutrient management, 3.5 crop management

Forages for Pasture and Grazing
February 22, 8:30 a.m.–4:45 p.m.
2104A Agronomy Hall, Iowa State University, Ames
5.0 crop management, 0.5 nutrient management, 1.0 pest management

Herbicide Physiology
February 24, 8:00 a.m.–5:00 p.m.
Comfort Suites, 2609 Elwood Drive, Ames
6.5 pest management

Brent Pringnitz is coordinator of the Agribusiness Education Program.