How Much Risk of Frost Do You Have?

Mark A. Licht
Iowa State University, lichtma@iastate.edu

Follow this and additional works at: http://lib.dr.iastate.edu/cropnews

Part of the Agricultural Science Commons, Agriculture Commons, and the Agronomy and Crop Sciences Commons

Recommended Citation
http://lib.dr.iastate.edu/cropnews/861

The Iowa State University Digital Repository provides access to Integrated Crop Management News for historical purposes only. Users are hereby notified that the content may be inaccurate, out of date, incomplete and/or may not meet the needs and requirements of the user. Users should make their own assessment of the information and whether it is suitable for their intended purpose. For current information on integrated crop management from Iowa State University Extension and Outreach, please visit https://crops.extension.iastate.edu/.
How Much Risk of Frost Do You Have?

Abstract
The last USDA crop progress report indicates 72% of corn in or past the dent stage with 5% of the corn acres mature and soybean with 26% leaves turning color. Heat unit accumulation has been and continues to be slower than normal resulting in a crop that is not maturing as early as planned. With the 50% probability of a 28°F frost generally being mid- to late-October, there is some concern with a fall frost killing the crop before maturity is reached, especially for corn.

Keywords
Agronomy

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences
How Much Risk of Frost Do You Have?

September 9, 2014

By Mark Licht and Sotirios Archontoulis, Department of Agronomy

The last USDA crop progress report indicates 72% of corn in or past the dent stage with 5% of the corn acres mature and soybean with 26% leaves turning color. Heat unit accumulation has been and continues to be slower than normal resulting in a crop that is not maturing as early as planned. With the 50% probability of a 28°F frost generally being mid- to late-October, there is some concern with a fall frost killing the crop before maturity is reached, especially for corn.

You can assess your risk of a killing frost by using the Corn GDD decision tool on the Useful to Useable website. This decision tool allows you to select a county and customize planting date, hybrid maturity, and comparison year. The tool then outputs growing degree accumulation and predicted date of black layer as well as fall frost frequency and date of 50% probability of first freeze.
This decision tool was used to calculate 2014 risk of frost for four different scenarios; planting a 102-day and 114-day hybrid on April 27, 2014 (Fig. 1) and planting a 102-day and 114-day hybrid on May 25, 2014 (Fig. 2). April 27 and May 25 were used because they represent when approximately 10% and 90%, respectively, of the Iowa corn acres were planted.

Figure 1. Useful to Useable Corn GDD decision tool scenarios for April 27 planting date with 102 day and 114 day hybrids. Green, yellow and red colors indicate low, moderate and high frost risk prior to reaching maturity.
Figure 2. Useful to Useable Corn GDD decision tool scenarios for May 25 planting date with 102 day and 114 day hybrids. Green, yellow and red colors indicate low, moderate and high frost risk prior to reaching maturity.

These four scenarios were run for select counties representing each of Iowa’s nine crop reporting districts. These figures suggest that corn planted in April of well adapted maturities have little to no risk of a killing freeze before maturity. The figures also indicate that later planted corn, even at shorter maturities may be at moderate risk of a killing freeze in the northern two thirds of Iowa.

What’s this mean for infield grain dry down?
Corn drydown infield is dependent on ear characteristics, date maturity is reached and weather (with temperature, humidity and wind to be the most influential). Ear characteristics that influence grain dry down are explained by Bob Nielson in Field Drydown of Mature Corn Grain. When maturity is reached later than normal not only are days suitable for drying reduced but the expected drydown rates are also reduced. Drydown rates can range from 0% to 1% per day. Cool, wet weather delays dry down while warmer, drier conditions speed up dry down. A rule of thumb for Iowa would be 0.75% to 1% per day in September, 0.25% to 0.75% per day in October, and less than 0.25% per day in November.

It should be expected that corn will reach maturity later than normal this fall. And likewise, infield grain dry down rates will be lower. While it might be tempting to leave crops in the field anticipating better drying conditions this also increases the risk of field losses.

Mark Licht is an Extension cropping systems agronomist with responsibilities in corn and soybean management and production. He can be reached at lichtma@iastate.edu or 515-294-0877. Sotirios Archontoulis is an assistant professor of integrated cropping systems and can be reached at sarchont@iastate.edu or 515-294-7413.

**Category:** Crop Production

**Crops:**
Corn
Soybean

**Tags:** Corn Soybean Weather frost risk frost

**Authors:**

**Mark Licht** Extension Cropping Systems Agronomist

Mark Licht is an Extension Cropping Systems Agronomist. His work in Extension focuses on corn and soybean production and management but includes looking at production and management interactions across the cropping system landscape. Interests are also in precision agriculture and deve...

**Sotirios Archontoulis** Assistant Professor

Sotirios Archontoulis is an assistant professor of integrated cropping systems at the Department of Agronomy. His main research interests involve understanding complex Genotype by Management by Environment interactions and modeling various components of the soil-plant-atmosphere continuum. His ov...