BETWEEN THE ROWS®

Winter Survival of Corn Pests

Wyffels.com
March 2, 2022

When winter temperatures dip below average in the Midwest often times it leaves many corn growers asking, will insect pressure be lower this next growing season? Unfortunately, there is no quick answer, and it will depend on which specific insects we are discussing and other weather-related factors.

Winter Survival

Insects are cold-blooded and are reliant on their environment for warmth. Despite this, many insects are able to survive cold climates through production of anti-freezing agents, overwintering in a protected environment such as plant debris or the soil itself, or a combination of both.

When winter temperatures become colder than normal it seems likely that we would expect below average pest pressure for the following growing season, but this is not always case. Each pest needs to be assessed individually depending on location of overwintering, tolerance to cold temperatures, and climate conditions of the overwintering environment.

Southern Strategy

One of the best ways to survive extreme cold conditions is to overwinter in the south and avoid these conditions. This is the primary mechanism of survival for corn pests such as:

- Armyworm
- Black Cutworm
- Corn Earworm

These pests do not survive Midwestern winters and must migrate north from the southern states each year in order to feed on our Midwestern corn acres. In years where southern states experience below normal temperatures, it may lead to lower survival rates and/or delayed migration to the north.

Overwintering in a Midwest Environment

In general, these corn pests are well adapted to overwintering in a colder environment. Below average winter temperatures can have an effect on survival of these pests, but snow cover provides insulation which protects against exposure to cold temperatures.

Common corn pests that overwinter in the Midwest include:

- Corn Flea Beetle
- Stink Bugs
- Grubs and Wireworms
- European Corn Borer
- Corn Rootworm

Flea beetle and stink bugs

These two pests overwinter above ground in protected or grassy areas and can be susceptible to extreme cold temperatures. Although they are corn pests, they rarely cause significant yield damage to corn in the Midwest.

Grubs and wireworms

Grubs and wireworms find safety below the frostline. If winter conditions allow the frostline to penetrate deeper than normal, survival can be negatively affected.

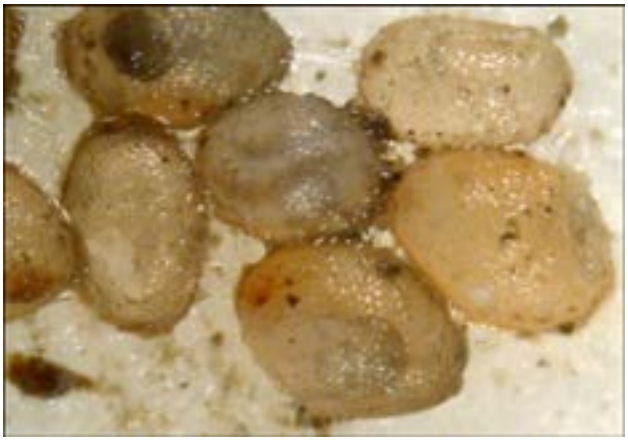
European corn borer

Corn borer overwinters in corn stalks and residue. Cooler than normal temperatures can negatively impact survival if snow is not present to buffer against extreme cold temperatures.

European corn borer overwinter as full-grown larvae in corn stalks or other plant residue. Photo credit: Purdue University; J. Obermeyer

Corn rootworm

Corn rootworm eggs overwinter in the soil. Studies have found that western CRW eggs can survive extended periods of exposure down to 14°F. The Midwest commonly experiences air temperatures at or below this during the winter months, but the key is to think of the soil environment. Residue, egg depth, and snow cover all play a role in buffering soil temperatures and usually keep the environment conducive to egg survival. Colder temperatures may affect shallower placed eggs, but keep in mind most eggs are deposited where soil moisture is present, with the bulk of egg laying taking place between 4-6 inches.



Corn rootworm overwinter as eggs in the soil. Photo credit: Purdue University

What about 2022?

Winter 2021-2022 has so far shown to be average to above average in terms of temperature. We have experienced some periods below normal, however, they have been short in duration. Additionally, snowfall for the Midwest has been average to below for most areas. When combined, these two factors set us up for pretty average winter survival and pest pressure for 2022.

Parts of Central Illinois and Southeast Iowa did experience above average snowfall this winter, which means ground temperatures likely didn't get as cold in these areas when they were insulated by snow cover. Given the fact that we already had mild temperatures, we wouldn't expect a big difference, but there could be greater winter survival in these areas that experienced increased snowfall.

One pest that I'm sure is top of mind is corn rootworm, especially in areas that saw above average rootworm pressure in 2021. These areas often coincided with drought and we would expect corn rootworm eggs to be laid deeper depths in these areas, allowing them to be even more insulated from cold temperatures. This will likely lead to sustained pressure for the 2022 growing season.

Corn rootworm larva. Photo credit: Marlin E. Rice

The weather we really need to pay most attention to for CRW survival is rainfall in May to early June during hatch. Corn rootworm are most vulnerable during the early larvae stage after hatch, and heavy rain during this time can have a big impact on CRW larvae survival.

Scouting Remains Important

As with all corn pests, scouting remains important. It's impossible to make assumptions on the coming season's pest pressure based on winter conditions. Although there may be pockets where a cooler than normal winter will reduce pest pressure, it will likely not be the norm especially for those major yield limiting pests (i.e., CRW). Insects that overwinter in colder climates are well adapted to do so. If CRW and corn borer pressure was elevated in previous years, expect it to remain high for the coming growing season. This ***Corn Scouting Calendar*** can help determine the typical time to begin scouting for common insect pests.

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