New Look for Illinois Pest Degree Calculator Provides More Options for Specialty Crop Growers

KELLY ESTES¹ AND JENNIE ATKINS²
UNIVERSITY OF ILLINOIS
¹ILLINOIS NATURAL HISTORY SURVEY, ²ILLINOIS WATER SURVEY

Pest Degree-Day Tools for Specialty Crop Growers

• Update target pest lists, focusing on specialty crops
• Improve current tools
• Maintain historical and forecast degree-day information
• Integrate new tools
• Maps
• Graphs
• Mobile-friendly

Improving the Degree-Day Calculator

2019 Goals/Activities

• Surveys: face-to-face grower meetings, print & electronic media and well as social media outlets.
• Summaries
• Evaluation

2020

• Setting the feedback into action
• Website redevelop started
• Our goal was to have this ready to roll out for growers at the January 2021 conference...but COVID.

Degree days aid in crop and pest management

• Forecast important life stages of insect pests
• Aid in timing activities such as scouting or pesticide applications
What drives development of an organism?

The development rate of many biological organisms is controlled primarily by temperature.

Models are used to calculate developmental units, known as **degree days**.

Degree days can be used to measure (and predict) the development of an organism based on current and historical data.

Degree-day Refresher

Degree-days are measurements of heat units over time, calculated from daily minimum and maximum temperatures.

Used to predict insect life cycles and in turn, insecticide treatments to those life cycles.

Insect Degree days

- Similar to plants, there are minimum and maximum temperatures at which development slows or stops.
- Minimum and maximum temperatures for development vary by insect.
- Values developed based on controlled experiments in the laboratory.

Degree days - insects

\[ DD = \frac{T_{max} + T_{min}}{2} - T_{base} \]

- \( T_{max} \) – Daily Maximum Temperature
- \( T_{min} \) – Daily Minimum Temperature
- \( T_{base} \) – Baseline or the lower developmental threshold (varies by insect)

Example

For example, a day where the high is 72F and the low is 44F would accumulate 8 degree days using 50F as the baseline:

\[ DD = \frac{72 + 44}{2} - 50 = 8 \text{ DD} \]

Example

For example, a day where the high is 98F and the low is 44F, but the upper developmental threshold for an insect is 90F, would accumulate 18 degree days using 50F as the baseline:

\[ DD = \frac{98 + 44}{2} - 50 = 18 \text{ DD} \]
Degree days

When do they begin accumulating?

Biofix
- An observable biological event that determines when DD accumulations begin for a particular insect
- Often the capture of insects in a pheromone trap

Calendar date
- Date varies by insect
- Often January 1 or March 1

Illinois Pest Degree Day Calculator

http://www.isws.illinois.edu/warm/pestdata/

Calculating Degree Days for Codling Moth

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Kelly Estes, State Survey Coordinator
Illinois Cooperative Agricultural Pest Survey Program
1816 South Oak St.
Champaign, IL 61820
(217)333-1005 (217)649-4087
kcook8@illinois.edu
https://ilpestsurvey.inhs.illinois.edu/
@ilpestsurvey
@ilpestsurvey
www.illinois.edu