

PREDICTING EUROPEAN CORN BORER DEVELOPMENT

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The European corn borer is a serious pest of corn and peppers in Kentucky. Corn borers overwinter as full-grown larvae in corn stubble. With the return of warm weather in the spring, development is resumed and the larvae pupate. Temperature plays a major role in determining the rate of corn borer development. The European corn borer has a 50° to 85°F temperature range at which it is most comfortable. Below 50°F it will not develop, and above 85°F development will slow dramatically. The rate of development of European corn borer can be predicted using this relationship. Dr. Grayson Brown at the University of Kentucky developed a degree day model which accurately predicts the occurrence of the different corn borer life stages. It is recommended that these predictions be used in combination with field scouting or pheromone trapping in order to make management decisions. These predictions will alert you to when it is necessary to monitor pheromone traps closely and scout fields for corn borers.

A degree day for European corn borer is one of degree above 50° F over a 24-hour period. For example, if the average temperature for a 24-hour period was 70° F, then 20 degree days would have accumulated ($70 - 50 = 20$) on that day. These accumulations can be used to predict when corn borers will pupate, emerge as adults, lay eggs, and hatch as larvae. With European corn borer, begin accumulating degree days January 1 of each year. Accumulated degree day totals can be compared with the values in the tables below that correspond to various

corn borer life history stages. Tables are available for the first and second generation, in some years a third generation may also occur. Values for the third generation are not available. Values corresponding to initiation indicate when the earliest individuals of that stage may appear.

For example, a degree day value of 750 would indicate that nearly 100% of adults have emerged from pupae, of which slightly more than 50% have flown, egg laying has begun, but is less than 25% complete, and that the earliest first instar larvae may be present. This example illustrates the need to compare the accumulated degree day total with values in several columns of the table. During the growing season there is usually a mixture of different stages in a field. Because corn borers emerge at different times, not all corn borers will be in the same stage at any particular time.

Current degree day accumulations are available for European corn borer as well as other insects for many locations in the state through the Agricultural Weather Center maintained by the UK Department of Agricultural Engineering. Up-to-date European corn borer estimates are available through the World Wide Web using the following address "<http://www.wagwx.ca.uky.edu/>" Click on the 'Ag/Wx Calculators' to access the insect models.

First Generation									
Percentage	Pupa	Adult	Flight	Egg	Larval Stages				
					1st	2nd	3rd	4th	5th
Initiation	250	420	550	610	750	970	1140	1290	1420
25%	340	540	690	790	920	1070	1220	1360	1490
50%	390	600	740	850	960	1110	1250	1390	1520
75%	450	650	790	900	1000	1140	1280	1420	1550
Peak	560	760	900	990	1090	1210	1350	1490	1620

Second Generation									
Percentage	Pupa	Adult	Flight	Egg	Larval Stages				
					1st	2nd	3rd	4th	5th
Initiation	1440	1620	1660	1740	1860	1970	2140	2250	2370
25%	1580	1730	1880	2020	2160	2280	2420	2540	2800
50%	1620	1780	1950	2110	2250	2370	2500	2630	2930
75%	1660	1830	2030	2190	2330	2440	2580	2700	3060
Peak	1730	1940	2190	2360	2490	2590	2720	2840	3500