

Heat Unit Research

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Summary

Heat unit requirements for early season short staple cotton development, spring emergence and generation times of pink bollworm have been field tested since 1975. These heat unit models can be used to determine 1.) pink bollworm spring population levels in pheromone traps compared to other years and/or other areas, 2.) when to start pink bollworm field monitoring, and 3.) when to time the application of pheromones by confusion or mass trapping for early season pink bollworm mating disruption.

Since insects and plants are "cold-blooded", their development times can be determined and predicted very accurately using heat unit accumulations. By using this system of keeping track of biological events based on heat inputs, we can eliminate most of the guesswork that occurs when we try to compare or predict insect and plant development using calendar dates that are not sensitive to differences in changing temperature patterns from year to year, area to area, and day to day.

The following table presents a summary of results from 6 years of field studies on heat unit requirements for pink bollworm and early season short staple cotton development in Arizona.

Heat Unit Requirements for Pink Bollworm and Early Season Short Staple Cotton Development Using Daily Maximum and Minimum Air Temperatures *

<u>Organism</u>	<u>Event</u>	<u>Average Heat Unit Requirement</u>
Pink Bollworm	Begin continuous spring emergence	500 from Jan. 1st
	50% spring emergence	1180 ± 30 from Jan. 1st
	Complete spring emergence	2200 ± 50 " " "
	Time to complete 1 generation	750 ± 50 from first time 10 day old cotton squares are available in early season, or from egg to egg or adult to adult during mid and late season.
Short Staple Cotton	First pinhead squares	700 ± 50 from planting date
" " "	First flowers	1190 ± 50 " " "
" " "	First 1" diameter bolls	1570 ± 50 " " "

* Heat unit accumulations are based on a computerized system using a base temperature of 55° F and a high cut-off temperature of 86° F. For heat unit tables and further information, contact Roger Huber, Entomology Dept., University of Arizona, Tucson, AZ 85721.

Pink Bollworm Pheromone Mass Trapping Research

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Summary

Comparisons of pink bollworm infestations in pheromone mass trapped long-staple cotton and untrapped long staple cotton showed significantly lower pink bollworm infestations in the mass trapped long staple during 1980. This is the third consecutive year that significantly lower infestations were found in pheromone mass trapped long staple cotton when compared with similarly managed untrapped long staple fields.