

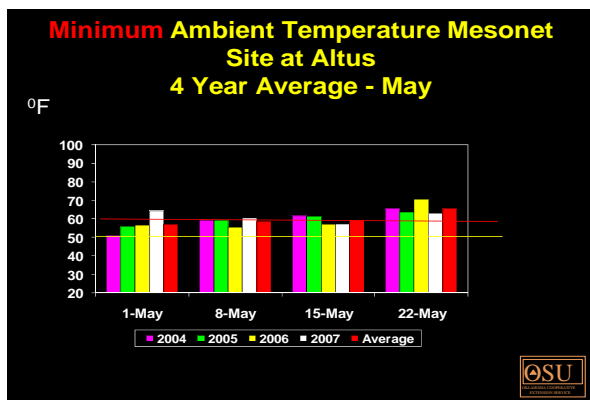
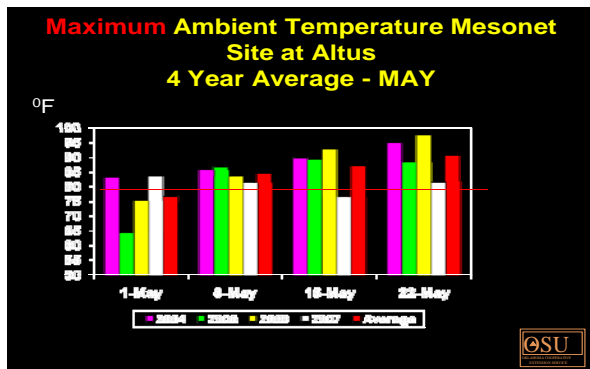
Cold Chilling Injury in Cotton

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Each year as the temperature warms it's tempting to plant cotton but it could too early. Germination can begin when the mean daily temperature is 60 degrees F at the planting depth, but growth may be slow at these temperatures.

At planting, soil temperatures in the seed and root zone should exceed 60 degrees F and the five day forecast for the daytime maximum temperatures should exceed 80 degrees F. Also, nighttime minimum temperatures should be forecast to be above 50 degrees for the following five days. In Oklahoma the four year average maximum and minimum air temperatures are shown in the following graphs.



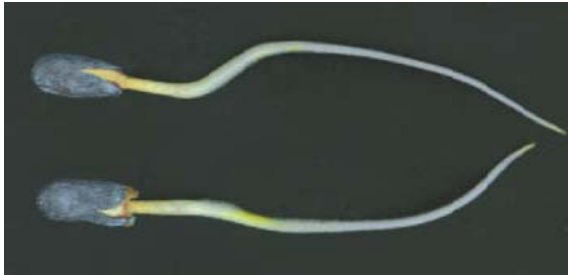
Based on the maximum ambient temperature at Altus, OK the four year average is above 80 degrees F starting the second week in May. In addition the minimum ambient temperature is not below 50 degrees F during this time as well. This is important since soil temperatures in the seed zone will mimic or lag air temperature by about 3-5 hours. Cold chilling injury occurs on germinating cotton seed at temperatures below 50 degrees F.

Cold chilling injury results in a dead root tip and a swollen club root that has lateral root growth and no main tap root growth. Cold chilling injury is shown in the pictures below followed by a photograph of normal cotton roots.

Cotton seed showing cold chilling injury, note the formation of lateral roots at the dead growth tip.



Normal root development



Germinating cotton that is exposed to temperatures less than 50 degrees will not grow to its full potential due to an injured root system. This will limit its ability to use moisture and fertilizer that is accessible to a normal root. Also, cold chilling injury slows emergence and predisposes the plant to root and seedling disease resulting in plant loss and delayed growth.

Distorted root growth can also be caused by soil compaction and the lack of deep soil moisture can cause distorted root growth although cold chilling injury has the most severe effect on seedling plants.

For more detailed information and further discussion on “Cold Chilling Injury on Cotton” read more at the links below and note information in this article was reproduced from the following:

<http://lubbock.tamu.edu/cotton/pdf/cptvol13no12007.pdf>

<http://lubbock.tamu.edu/cotton/pdf/scs-2005-17.pdf>

<http://pestdata.ncsu.edu/cottonpickin/disorders/>

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