GROWTH AND DEVELOPMENT

Peanut growth and development is temperature dependent, with 86°F being about optimal. High temperatures (> 95°F) slow plant growth and there is little growth below 60°F. Drought stress reduces flower production and pollination, and extreme soil surface temperatures cause peg abortion.

Peanut is an indeterminate plant capable of recovering from drought stress even during the reproductive period to rebloom and produce another crop of pegs. However optimal yields are produced when drought stress is avoided and extreme temperatures are minimized during the critical 60 – 100 DAP interval.

Temperature requirements can be thought of in degree days where the base developmental temperature (56°F) is subtracted from the average daily temperature and summed over a period of time. For example, medium maturity Virginia type peanuts such as Bailey and Sullivan require about 2,590 and 2,630 degree days (DD), respectively, whereas a somewhat later maturity Virginia type like Wynne requires about 2,700 DD.

Based on the 20-year temperature average shown below for Blackville SC, it takes about 124 days to accumulate 2700 DD if the crop emerges on 10 May. So adding 7 days for emergence, under optimal moisture conditions it should take about 131 DAP to mature a variety like Wynne at Blackville if we plant on 3 May. Many factors influence harvest maturity. Never dig based solely on days after planting. See the harvest maturity section to determine when to dig.
High Temperature Effect on Pollination and Seed Set:
Peanut pollination and seed set hold up well under hot weather as long as daily maximum
temperatures do not exceed 97°F.

Even under the most ideal conditions, maximum peanut pollen viability is about 90% and
maximum seed set is about 75%. Above 97°F maximum temperature there is some decline in both
pollination and seed set. If the daily high temperature reaches 104°F pollen viability can drop to
around 70% and seed set to around 50%. Although standard weather station temperatures seldom
reach 104°F, keep in mind that the air temperature within the peanut canopy may be greater than
that measured in weather station shelters.

PEANUT GROWTH STAGES

<table>
<thead>
<tr>
<th>Approx. days after planting*</th>
<th>Growth Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Emergence</td>
<td>Seedling “cracking” the ground and cotyledons visible</td>
</tr>
<tr>
<td>35</td>
<td>Bloom (R1)</td>
<td>Half of the plants with a bloom</td>
</tr>
<tr>
<td>45</td>
<td>Peg (R2)</td>
<td>Half of the plants with a visible peg</td>
</tr>
<tr>
<td>50</td>
<td>Swollen peg (R3)</td>
<td>Half of the plants with a peg tip swollen to twice the peg diameter</td>
</tr>
<tr>
<td>60</td>
<td>Full size pod / begin pod-fill (R4 – R5)</td>
<td>Half of the plants with a full size pod (R4) and a visible seed beginning to form (R5)</td>
</tr>
<tr>
<td>75</td>
<td>Full size seed (R6)</td>
<td>Half of the plants with a seed filling the pod cavity</td>
</tr>
<tr>
<td>100</td>
<td>Early maturity (R6)</td>
<td>Half of the plants with a pod having interior hull color and orange to brown mesocarp</td>
</tr>
<tr>
<td>130 – 140</td>
<td>Harvest maturity (R8)</td>
<td>70% of harvestable pods have an orange, brown, or black mesocarp, with 30% in brown / black category. For runners, 75-80% in orange, brown, black; with 40% brown/black. (based on pod blasting)</td>
</tr>
<tr>
<td>150</td>
<td>Over-mature (R9)</td>
<td>Kernels in oldest pods develop tan-brown seed coat and pegs may have deteriorated; over-mature pods have coal-black mesocarp color.</td>
</tr>
</tbody>
</table>

*Based on adequate soil moisture and average temperature conditions for a mid-maturity (130 – 140 day) variety at Blackville.

Peanut Management Calendar: For a brief step-by-step management timing outline based on
days after planting and growth stage see the Peanut Management Calendar at the back of this book.

Growth Regulator: If vine growth control is needed for digging, Apogee (7.25 oz/A) can be
applied when 50% of the laterals touch in the row middle. A second application is made at 100%
row closure. Treating “marker rows” such as the middle two of a 6-row digger pass is more cost-
effective than broadcast treatment, but on varieties with very high canopy biomass such as Bailey,
broadcast treatment has improved yield above and beyond just the benefits of staying on the row.
Effective uptake of Apogee requires addition of nitrogen to the spray solution. Use 1 pt
urea/ammonium nitrate (UAN) or 1 lb ammonium sulfate (AMS) per treated acre. 1 qt/A crop oil
concentrate is also recommended.