

# AGRONOMIC ALERT



## Soybean Bloom and/or Small Pod Abortion Due to Extreme Heat

During the early reproductive stages, a soybean plant may abort flowers and small pods as it adjusts to the surrounding environment. The percentage of flower and/or pod shed is determined by how much fruit the plant can support to full development. While some flower and small pod shed is a normal occurrence, unfavorable growing conditions such as high temperatures or drought may cause the plant to abort many more flowers and/or small pods than usual. The loss of flowers and small pods can be alarming to many producers who may already be concerned for their crops struggling with unfavorable growing conditions.

A soybean plant may produce more flowers than it needs, especially with optimal early-season growing conditions. Soybeans that are produced in high input/high yield environments may grow faster and produce more nodes and flowers. When flowering occurs at a high rate early in the season, many flowers may be aborted later while still maintaining high yield potential.

### Soybean Physiology—Flowering and Pod Set

The nodes on the soybean plant will produce a cluster of flowers. Soybean flowers self-pollinate, so pod set can occur shortly after the appearance of the flower. During this early reproductive stage as many as 60 to 75% of the flowers and/or small pods may be shed by the plant.

Flower and small pod abortion is a natural part of soybean growth and development. When a flower or pod is shed from the plant the soybean plant is adjusting to its environment. The amount of plant photosynthate available will dictate the number of pods that will reach maturity. If the plant produces more pods than the production of photosynthate, flowers and/or pods will be shed. If the plant produces sufficient photosynthate, the plant may continue to flower and set additional pods. Fields that have severe early flower and small pod shed may initiate more flowering and possibly set new pods if environmental conditions improve to increase photosynthate production; however, yield potential may already be compromised by early stress.

### Heat/Drought Stress

Heat and/or drought stress during the R3 to R6 (beginning pod to full seed) growth stages may increase flower and small pod abortion. A study conducted by Mann and Jaworski (1970) results showed that pod formation was severely limited at temperatures above 40°C (104° F). Pods will typically not abort once a plant reaches R6 stage. During seed filling stages, remember that any yield loss encountered is likely realized through reduced seed size due to unfavorable environmental conditions and not necessarily by pod shed.



### Management

High soybean yield requires an aggressive pod and seed set; however, a moderate amount of early flower or pod abortion will not necessarily hurt yields. The soybean plant is amazingly adaptable and will simply produce more and larger seed if enough photosynthates are available. The final yield is determined by the genetics of the variety and the end result of the environment.

Little can be done to prevent soybean plants from shedding flowers or pods in hot weather except reducing other environmental stresses as much as possible. Stresses to the soybean plant should be closely monitored and controlled if possible. Insect or disease stress and nutrient availability are factors a grower can usually control. When irrigation is available, the application of water may help alleviate heat stress. In short, control the stresses that you can, and hope that Mother Nature cooperates along the way.

*Sources: Egli, D. B. 2005. Does Flower Abortion Limit Soybean Yield? Corn and Soybean Science Group Newsletter. University of Kentucky Cooperative Extension Service. <http://www.uky.edu> (verified 8/15/10)*

*Mann, J. D., and E. G. Jaworski 1970. Comparison of stresses which may limit soybean yields. *Crop. Sci.* 10:620-624.*

*Soybean Growth and Development. University of Minnesota Extension. 1998. WW-05071. (verified 8/10/10)*

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