Soybean Bloom/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 and/or drought may cause the plant to abort many more flowers and/or small pods than usual. The loss of small pods, along with less than optimum pod set, can be alarming to producers who may already be concerned for crops struggling with very stressful growing conditions.

A soybean plant often produces 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 good 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.

**Excessive 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) 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 Suggestions**

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.

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. Visit soybean fields on a regular basis to determine current conditions. Scout for insect and disease stress and apply timely control measures when necessary. It is also advisable to monitor yield potential and update marketing plans as needed. When irrigation is available, the application of water may help alleviate heat stress. In summary, control the stresses that are within your power. The final yield will be a result of genetics, management and the environment interacting with natural resources.

**Sources:**