

July 24, 2012

## Soybeans – Grain or Hay

The deterioration of the corn crop due to heat and drought are obvious but soybeans seem to be hanging in there. Soybean is susceptible to yield loss from water deficit, drought stress, at two key development stages, germination and reproduction-seed development. Drought stress at germination or after germination results in poor hypocotyl elongation, while root elongation may be unaffected. This response in soybean allows the plant to search for additional soil water while having an overall low water use rate. Assuming adequate rainfall occurs again, soybean has the ability to reinitiate shoot growth, and shoot growth rate may be greater than that observed prior to the onset of drought stress. This is called compensatory growth.

Short term moderate drought stress during vegetative growth stages generally does not impact soybean yield. However, longer-term severe drought stress can cause irreversible plant cell death causing low yields. Soybean yield is most sensitive to water deficits during reproduction. Water deficits at this stage result in increased flower abortion, reduced pod number, reduced seed per pod, and small seed. Nitrogen fixation is a key biochemical pathway for soybean yield and nitrogen fixation can be severely limited or completely halted by even moderate drought stress. Once nitrogen fixation has been stopped, substantial precipitation and soil water accumulation is required to reinitiate the process. Compensatory reproductive growth rarely occurs in soybean under moderate drought stress at reproductive growth stages.

The heat and drought and shortage of forage have some farmers considering the possibility of harvesting drought-damaged soybean for hay or silage. Soybeans were first introduced to the United States as a forage crop and still have that potential. According to Rob Kallenbach, Forage Specialist, University of Missouri, soybean hay or silage should be harvested when 50% of the pods have immature beans. Fortunately, soybean makes decent quality hay or silage at any stage before the beans fully develop. Quality of soybean hay is quite variable but typically contains 16 to 19% crude protein and 50 to 55% TDN if harvested when 50% of the pods have immature beans. Once leaf drop starts, forage quality drops rapidly and soybean probably should not be harvested for forage after this point.

There are some potential problems with soybean hay.

1. Immature beans dry slowly in the pods and often mold inside the hay. Crimping the hay with a mower conditioner will make drying more even, but the pods are still the slowest drying part of the plant. Waiting to bale until the pods dry fully reduces the problem, but more leaves will be lost. Chopping soybean for traditional silage or making them into baleage will minimize the problem. If making soybean into silage, the ideal moisture content for storage is 55%.

2. Soybean hay does not weather well when stored outside. Large round bales left unprotected from rain deteriorate much faster than grass hay. It is not uncommon to lose 50% of the forage to weathering if left unprotected. Store in a well-drained and covered stack or in a barn. Net wrap helps keep the bales in better shape for feeding than twine does.
3. Soybean hay is stemmy and may be refused by cattle. Typically, 10-20% of soybean hay is wasted during feeding due to the coarse stems. If soybean is harvested for silage, or if soybean hay is chopped in a tub grinder, cattle will eat almost all of it.

**CAUTION:** Soybean treated with many herbicides can **NOT** be used for livestock feed. If in doubt, **READ THE LABEL!** Because the restrictions on herbicide labels change frequently **BE SURE TO READ THE LABEL** of any herbicide applied to soybean before harvesting for forage.

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