

# TECHNICAL BULLETIN

## Late Season Frost on Soybeans

Soybeans can be easily damaged by late season frosts where temperatures drop to 28 degrees F or lower for more than a few hours. Soybeans are easily injured by frost until they reach physiological maturity, which is generally attained at “yellow pod” or R7™ growth stage (see below). Yields will generally not be hurt by frosts occurring after this stage, if pods remain intact. Depending on variety, the period before R7™ is considered a “Risk Zone” for damage to yields from frost. Freezing at the R6 growth stage and earlier will result in reduced yield and damaged beans with greenish color and wrinkled seed coats. Protein content should not be affected by frost; however oil content will generally be reduced if frost occurs before R6. Germination of seed beans is not significantly affected if the frost occurs after R6. But, frosted beans may have lower emergence scores and can be extremely susceptible to early fungal diseases. Therefore it is not recommended to keep frosted soybeans for next year’s seed.

Fields should not be harvested until pods have a mature color, even if a killing frost occurred when the pods were green or yellow. Beans on frost-damaged plants will mature and change color at least as early, and perhaps earlier than, undamaged soybeans. However, the frosted, dead leaves will remain on the plant and some beans may retain their green color.

In summary, if frost occurs after growth stage R6, yield losses will be minimal and the oil and protein content should not be diminished. The most serious effect of an early frost on soybeans may be the potential reduction in seed quality.

Growth Stage	Description	Yield Reduction
R4 Full pod	Green pod 3/4 inch long at one of the four uppermost nodes on main stem	70 –80%
R5 Beginning seed	Seed 1/8 inch long in a pod at one of the four uppermost nodes	50-70%
R6 Full seed	Pod containing a green seed that fills the pod cavity at one of the four uppermost nodes	15-30%
R7 Beginning maturity	One normal pod on the main stem is yellow and 50% of the are leaves yellow	0-5%
R8 Full maturity	Ninety-five percent of pods with mature brown color.	0%

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