

Sprouting Damage and Harvest Management in Sorghum

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Recent prolonged rainfall following a period of dry weather has opened the door for preharvest sprouting of grain sorghum across all counties in North Carolina. Reports from the piedmont, coastal plain and tidewater indicate sprouting in almost every field. Preharvest sprouting of grain sorghum occurs when there is a period of prolonged rainfall, high humidity, high temperature and alternate periods of wetting and drying that last for several consecutive days. Weather variables that affect the amount of preharvest sprouting include the amount of rainfall, humidity, temperature, and wind that is received.

What is Preharvest Sprouting and How Does it Affect Sorghum Grain and Quality?

When inspecting the sorghum head or panicle the protrusion of the radicle through the seed coat of one or more seeds is a visual confirmation of sprouting. During periods of wet weather the protrusion of the radicle is followed by the emergence of white or light green coleoptile and small green sprouts from the seed. Once the rainfall ceases and drying occurs, the radicle and coleoptile sprouts become shriveled and inconspicuous except upon close inspection. Sprouting leads to the breakdown of kernel structure and eventual loss of viability. Weathered grain is usually discolored in external appearance, has a dark discolored embryo, and the inside of the kernel is chalky in appearance due to partial hydrolysis of starch and protein. The most obvious damaging effects of sprouting are yield losses due to shattering, and lower grades and bushel weights. A lower grade will result in a lower price per cwt of grain sorghum. Also, the growth of fungi can occur increasing the incidence of mycotoxins. The conditions that favor sprouting often compound the problem by delaying harvest. At harvest time, weathered grain tends to be trashier and has a higher percentage of fines and broken kernels. Grain sorghum is not significantly altered nutritionally by weather damage. For livestock feeding purposes only slight differences in nutritive value or chemical composition have been found when comparing nonweathered to weathered grain sorghum. Also, livestock and poultry feeding trials have shown that weathered grain sorghum does not hinder animal performance.

What Should a Grower Do About PreHarvest Sprouting?

Few remedies are available for preventing preharvest sprouting when weather conditions promote preharvest germination. Prompt harvest of the grain is usually the best solution to prevent further sprouting and to reduce the damage to the grain that has sprouted but this is easier said than done when rainfall persists over a long period of time. Depending on the stage of development of sorghum in the field growers should consider two options.

1. If over 60% of the grain in the field has some brown or red color indicating the beginning of maturity (or in the case of white or yellow sorghum has grain at the top of the head that has hard kernels) growers should apply a killing desiccant such as Roundup as soon as weather permits. This will kill the sprouts along with the sorghum plant itself and prevent further deterioration of the grain and hasten harvest. Plants that have green kernels that are in the milk or soft dough stage will dry down and those kernels will turn color allowing them to be harvested. While this will result in smaller kernels and some chaffy or light kernels this is still preferable to losing more of the earlier maturing grain.
2. If less than 60% of the field has kernels that are maturing then the grower should NOT apply a killing desiccant but rather wait for drying weather to stop further sprouting damage. In this situation the loss of the sprouted grain or the reduction of grain quality is a small loss compared to the loss of kernel weight in the immature plants. Clearly, whether or not a grower uses a killing desiccant is a judgement call that should be made on a field by field basis.

Summary

- Preharvest sprouting of grain sorghum is caused by weather conditions that feature prolonged rainfall following a period of dry weather. While some sorghum hybrids will sprout less than others most growers will experience some preharvest sprouting in these types of weather conditions.
- While the grain is damaged causing lower grain weight, test weight and yield there is little loss of feed value
- The only remedy is to manage harvest – growers with 60% or greater of the field with maturing (brown or red) grain should desiccate and harvest as soon as possible – growers with less than 60% of the field with maturing grain should wait for dry weather to stop the sprouting and then harvest when the majority of the grain in the field has matured.