

## Proper Curing Management to Minimize the Occurrence of Green Tobacco

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Properly cured tobacco is the result of many physical and chemical changes that transform tobacco from the green, high-moisture leaf at harvest to the aromatic, low-moisture leaf that is sold. These changes begin even before tobacco is harvested in the field. As leaves ripen and begin the process of leaf senescence, chemical changes begin and continue after the tobacco is cut and hung in the curing barn. Many environmental conditions influence how well tobacco cures. Therefore, many undesirable effects can arise when curing conditions are improper. One of the most common results of improper curing is “green” tobacco. Tobacco that is considered green is less desirable and will usually receive a G (green) grade for color and a discounted price.

Harvesting of immature tobacco is often associated with the occurrence of green tobacco in the barn because the natural process of leaf senescence has not had time to proceed to a desirable level when the tobacco is cut. Tobacco that has been produced with excessive levels of nitrogen or that has been through a drought will often require more time than normal crops to mature due to excess nitrogen remaining in the plant at the end of the growing season. Tobacco that is immature when cut or allowed to sunburn in the field (particularly dark tobacco) is more likely to cure green regardless of the curing conditions in the barn. Additionally, immature tobacco has not reached maximum weight potential in the field and will cure to thin, medium body, close-textured leaves that are low in oil and weak in strength.

In most years, tobacco transplanted in mid- to late May will be ready for harvest in mid- to late August. Tobacco cut and housed in August is usually not exposed to the low temperatures in the early stages of curing that are associated with green tobacco. However, growers who transplant tobacco late or experience adverse weather conditions or other situations that delay harvest are more likely to face conditions conducive to green tobacco.

### Critical Factors in Curing

Although proper harvest timing is important, the most critical factors that lead to green tobacco occur in the barn. Properly cured tobacco requires mean daily temperatures of 65° to 90°F, mean daily relative humidity of 65 to 70%, and a minimum airflow of 15 ft/min (0.17 mph).

Although relative humidity has the narrowest optimum range and is therefore the most difficult to control, temperature has the greatest influence on the occurrence of green tobacco. Even if tobacco is harvested at maturity, is free of sunburn, and is housed properly (8- to 12-inch spacing between sticks on the tier rail for most barns), low temperatures (<60°F) in the early stages of curing can still cause green tobacco regardless of the relative humidity and airflow. At temperatures below 60°F, the chemical conversions that allow chlorophyll to disappear from the leaf leaving the yellow leaf pigments, carotene and xanthophyll, occur too slowly, and green pigment remains in the leaf.

Drying rate also has an effect on the degree of green color remaining in the leaf. High drying rates increase the extent of green pigment remaining in the leaf and make it difficult for green to be removed in later stages of curing. If tobacco is drying slowly and some moisture remains in the leaf, it is possible to “run” the green out of the leaf if temperatures rise into optimum range.

However, low temperatures early in the curing process may also be accompanied by low relative humidity that causes the drying rate to be too fast. Tobacco that is undergoing an optimum drying rate will come in and out of order almost daily and will be moist and pliable in the morning (in order) and dry in the afternoon (out of order). When drying rates are too fast, the leaf does not stay in order long enough for adequate color change to occur. Under these adverse curing conditions, temperatures need to be 70° to 75°F.

If temperatures do not increase into this range naturally, growers may want to use small heaters or even small fires under the tobacco to raise the temperature inside the barn. The drying rate can be slowed down by closing ventilators and barn doors during the day to slow moisture loss. Doors and ventilators should be opened at night to allow moisture from the more humid night air to enter the barn. Under extremely dry conditions, growers can also increase the relative humidity in the barn by spraying water on the barn floor, walls, and even the tails of tobacco on the bottom tier. If weather conditions remain cool and dry, spraying should continue frequently until adequate color change is achieved. Applying water to cured tobacco should only be used as a last resort due to possible houseburn risk and adverse effects on quality.

It is easier to maintain warmer temperatures in dark fire-cured tobacco barns than in air-cured barns. However, if cool conditions occur in the five to eight days after hanging and before the first normal firing, small fires can be started earlier than normal to raise the temperature of the barn to at least 70° to 75°F. If tobacco is drying too fast, growers should add moisture to the sawdust, barn walls, and possibly the bottom tier of tobacco and close ventilators and barn doors.

## Summary

Green tobacco is a problem that reduces profits each year, but it can be prevented or at least reduced by:

- refraining from excessive use of nitrogen,
- harvesting at maturity,
- preventing sunburn in the field,
- housing the tobacco properly, and
- manipulating environmental conditions in the barn.