



Curing Methods And Materials Have Changed For Dark Fire-Cured Tobacco

“Mixed Wood Species And Quality Of Sawdust Can Create Challenges In Fire-Curing”



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The overall fire-curing process for dark tobacco is one of the few things that hasn't really changed much in a long time and still remains more art than science. Yellowing, color setting, drying, and finishing are still the curing stages that occur

in the process of transforming dark-fired tobacco from the freshly harvested green plant to the characteristic deep brown, heavily finished, aromatic leaf following curing. Tobacco is housed and allowed to begin yellowing under natural ventilation or forced air for several days before the firing process begins. Traditionally, four to five firings were used that corresponded closely with the stages of curing. In recent years, buyers have favored slightly less smoke finish on the cured leaf which has reduced the number of firings. Additionally, more aggressive curing techniques have been used, particularly by larger growers, to speed the curing process and allow first cures in double-crop curing to be complete in 4 to 5 weeks instead of the traditional 6 weeks or more. Some growers may now use as few as 2 fires.

While we have only a limited amount of control of how hot a dark-fired barn will get during firing, we would like for barn temperatures to not get much over 130 F, even during the drying phase. We know that tobacco can be dried and sufficiently fire-cured and finished without exceeding 130 F, and when barn temperatures substantially exceed 130 F for a sustained period of time, increases in tobacco-specific nitrosamines (TSNAs), which are major carcinogens in tobacco, can be expected. Our research in 2011 showed that when barn temperatures reached 160 to 190 F, a three-fold increase in TSNA was seen compared to an identical barn where temperatures did not exceed approximately 130 F. The general rule of thumb for heat regulation in dark-fired barns is more slabs and less sawdust equals faster burning and more heat, and less slabs and more sawdust equals slower burning and less heat, depending on how seasoned and dry the slabs and sawdust are. The number of fires started in the barn also influences speed of burning and heat. We would like to have lower fires early in the cure to slowly complete yellowing and begin color setting, and hotter fires during color setting and particularly during drying. Finishing fires can also be lower heat as we are mainly trying to maximize smoke volume in the barn to increase the smoke finish on tobacco that has some order.

Although the length of the process has changed somewhat for some growers in recent years, the primary materials used in fire-curing are still wood slabs and sawdust. The slabs are laid in the floor of the barn in rows, beds, or even solid, and covered with sawdust. Sawdust

over the burning slabs causes a smoldering fire with little or no open flame. Dark-fired tobacco growers are dependent on the sawmill industry to provide slabs and sawdust, and in some cases woodchips, for fire curing. As the number of sawmills in the dark tobacco region of Kentucky and Tennessee have declined, so has our ability to obtain quality materials for fire curing. Ideally, we would like to use hardwood slabs and coarse, circular sawdust from sawing of oak and hickory. In reality, much of what we get now may still be predominantly hardwood, but may also contain substantial amounts of other species such as sycamore, poplar, and even sweet gum. We have been able to largely avoid pine and cedar which would likely impart unpleasant flavor and aroma characteristics in the tobacco. Although the mixing of wood species in our firing materials has been a concern, a larger concern to many growers is the texture of much of the sawdust that we may get today. In the past, most sawmills used circular saw blades that produced a coarse, fairly uniform sawdust. Today, some sawmills use band saw blades that produce much finer and less uniform sawdust.

While the finer band sawdust can be used successfully for fire-curing, growers should be aware that fires with band sawdust can behave differently than when coarser circular sawdust is used. It has been observed that the finer band sawdust is more difficult to wet and has more of a caking tendency, causing the fire to tunnel more under the sawdust. When this occurs, it can be expected that barn temperatures will be somewhat hotter with more open flame exposed, and more open flames could result in increased exposure to nitrous oxides (NOx) in the tobacco. Increased temperature and increased NOx can result in increased TSNA. The sawdust finally falls in on the fire as normal, but may cause more cinders and sparks when this occurs. It has also been observed that fires may try to burn on top of the finer band sawdust. Although we would always like to use moist sawdust, it is recommended to spend more time wetting down band sawdust before loading the barn.

It is unclear if the use of the finer band sawdust plays a role in increasing the likelihood that a barn catches on fire. Nonetheless, growers should use extra precaution when using band sawdust. Make sure the sawdust is as damp as possible before loading the barn. Trying to wet the tops of rows or beds after the barn is loaded may only result in more caking with band sawdust. It may also be a good idea to use a little more sawdust in the barn if band sawdust is used and make sure all slabs are completely covered. As a safety precaution with any firing, always maintain adequate clearance of 2 feet or more between sawdust and walls and posts in the barn. Δ

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