

## Maple Grading in New York

*Stephen Childs, New York Maple Specialist*

I recently attended the New England Maple Grading School in New Hampshire and came away with a better understanding of just how confusing this whole issue of maple grading can be. Since many states and provinces were represented there, our first task was to understand the different regulations. The state and province regulations vary significantly and so do the definitions. Some states have no regulation at all. The USDA standards for grades of maple syrup are voluntary and violations are based only on incorrect grading of products. States generate their own standards that are enforced by their agriculture or markets departments. I can see why selling across state lines can be a major headache. For instance, there is no “fancy” syrup in New York, but if light amber syrup produced in New York is sold in Vermont it must be labeled fancy or it can be pulled off the shelf as improperly labeled. Canadian syrup correctly graded as medium amber by Canadian standards and shipped for sale in New York could be pulled from the shelf here because by New York standards it should be classified as dark amber.

Even the trusted thermometer cannot seem to give a universally accepted syrup product. Not that the thermometer is wrong, the standards for finished syrup density differs from place to place. In New York, syrup is of legal density when at or above 66% sugar or 66° Brix at 68° F. That would require a finish temperature of 7.1° F over the boiling point of water. In Vermont, the lower limit is 66.9% sugar or 66.9° Brix at 68° F, this would require a minimum finish temperature of 7.46° F over the boiling point of water. Several states also place an upper limit on the density of syrup that can be sold. New York does not have an upper limit. In New York, a producer is free to make and market an extra thick syrup that would be pulled off the shelf as off grade if sold in Vermont.

### **Grading for density**

Density testing with the hydrometer though reasonably accurate at measuring density is affected by temperature. Density or thickness decreases as temperature increases. The key issue when using a hydrometer to finish syrup is to make corrections for the temperature of the syrup being tested. For instance, syrup that had a hydrometer reading of 67° Brix at 68° F would have an acceptable finish density. However, if this same syrup were still cooling after boiling and tested at 120° F, it would read 64.6° Brix on the hydrometer. This reading could make one think it was not yet up to legal density if the temperature adjustment was being ignored.

A very simple means of measuring density is with the hand held refractometer. The concern here is that some models automatically adjust for the temperature and some do not. Be sure you know which you have and adjust accordingly. Even the units that automatically adjust for temperature are for a limited range of temperatures, typically 60° F to 100° F. I found on the manually adjusted refractometer I could throw off the adjustment thermometer by where I held it with my warm hands when taking the reading. Also adjusting to the syrup temperature may take a little time, so an immediate reading may not be as accurate as waiting a minute or so. The hand held refractometer is also

poor at reading hot syrup. This makes it impractical to test the density of syrup that is being boiled and nearing finish. By the time the sample cools enough for a correct reading, the syrup being boiled has changed. I'm also learning that as I get older seeing some refractometer scales seems more difficult.

The new digital refractometer appears to be very easy to use, simple to read and automatically adjusted for temperature. The first day of using this tool at the grading school was very disappointing. The various instruments did not agree and even a given machine was constantly changing its reading. A discussion with a company representative did wonders. We were used to placing just a drop or two of syrup on the hand held refractometer and continued that practice with the new digital tool. We were advised to fill the sample well as full as possible using more like a teaspoon or two of syrup. This change did wonders. Following this change in the amount of sample used, all the machines were reading consistently.

### **Grading for color**

The color and flavor of maple syrup were also very problematic to the grading school participants. Color of syrup fortunately is consistent between all the states, the USDA and Canada. The color standards of US Grade A and Canada Number 1 are the same; however, the three subdivisions or classifications of this grade are not titled the same. The lightest classification of US Grade A is called light amber in New York and all other states except Vermont where it is called Fancy Grade Light, but Canada calls this classification extra light.

The USDA standard and most states including New York say the flavor must be characteristic of the color. In other words, a light colored syrup that for some reason carried a flavor normally associated dark syrup should be titled dark amber. The interesting issue here is that to sell syrup in New York, the producer or packer is not required to list the classification (light, medium or dark amber). Only the fact that it is Grade A or Grade B "extra dark for cooking" is actually required. If the producer chooses to list the classification (light, medium or dark amber) on the label, then what is in the container must meet that standard or it can be pulled as off standard.

The only legal color standard used in New York is the "USDA glass color standard". The Vermont temporary kit may be very helpful, allowing the producer to come very close to the proper classification but an inspector from New York Agriculture and Markets will have to test it against the USDA glass color standard according the current New York law. At the grading school with various levels of light and a mix of color grading kits, we found the 33 of us occasionally disagreed as to the color classification of some samples. Many samples clearly belonged in certain color classes, others due to variation in the kits, light levels and individuals eyes were not so consistently assigned the right color. Having lots of light when grading is a must. There is much more to be said on the issues of color grading and flavors which I need to save for a separate article.

We spent some time evaluating the performance of light transmission equipment, such as the Hanna meters. We again were having some trouble getting consistent readings. Some light transmission machines seemed to consistently read the samples slightly darker than machines made by other manufactures. Many times the same machine would give slightly different reading on the same sample. It was obvious that using the proper standard to calibrate these machines is very important. Calibration, cleanliness of sample tubes, consistency of room and sample temperature and clean storage of the equipment and sample containers all must be meticulously managed. Where the small plastic sample containers are used, they should only be used once or very carefully cleaned. They must not be scratched. Readings should be taken from each of the four sides of the sample and averaged to get results in which you can have good confidence. The sample containers may have small scratches or defects that may change the reading from one or more of the sides, thus the need for an average of the reading from each side. All this was very interesting except that light transmission is not a legal grading measure in New York. New York has no standard for this. In fact, Vermont is the only state that has a transmission standard. Canada has a national standard. That's not to say the standards won't change in New York in time but right now it doesn't exist

Overall the training was very helpful and useful. If you sell only in New York you have just a few key things to remember. Color grading is based on the USDA glass color standard which is closely mimicked by the Vermont temporary and other grading kits. The color Grades in New York are Light Amber, Medium Amber, Dark Amber, and Extra Dark for Cooking. Minimum density is 66° Brix at 68° F obtained by boiling sap to 7.1° F over the boiling temperature of water. Grade A syrup must be of good maple flavor, characteristic of the color, clean, practically clear, practically free of damage and free from serious damage. B grade syrup can be sold in a pint or larger container and must be marked with "Extra dark for cooking" and should be of fairly good color and flavor with no serious damage. For a copy of the New York grading law "Circular 947" and "US standard grades" go to the Cornell Maple Web Page <http://maple.dnr.cornell.edu>. If you sell outside of New York, I would be glad to assist you with understanding the regulations in other areas.

Stephen Childs, Maple Extension Specialist, Cornell University