Ask Proctor

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We regularly get questions from maple producers about which defoamers are the best to use. Of course, the answer is…it depends.

Defoamers are used to break the surface tension of boiling sap and syrup, reducing the tendency to form bubbles and boil over. The objective is to use as little defoamer as possible when controlling foam to avoid developing off-flavors or an oily mouthfeel in syrup. As all producers recognize, the nature and extent of foaming varies considerably between boils and across the season, ranging from almost nonexistent foam to essentially uncontrollable foaming (especially at the end of the season). The quality of sap/concentrate, the level of heat, and the amount of niter/scale build-up on evaporator pans all affect the propensity of syrup to excessively foam. The efficacy of defoaming measures also varies, with little needed at times and large amounts needed at others.

Traditionally defoamers were whatever maple producers had at hand. Since many producers were also farmers of one kind or another, milk, cream, butter, pork fat, or even balsam brush (due to the waxy cuticle on the foliage) were used. Due to allergen, possibility of rancid off-flavors, and general food-safety concerns, these are no longer permitted for use when making syrup to be sold to consumers.

The first step in defoamer choice depends upon whether the operation is organic-certified or not. Organic-certified operations can only use approved defoamers, mostly natural plant-based cooking oils with low flavor profiles and a high smoke point. Conventional operations have a wider range of options for commercially-produced defoamer products. These are considerably more effective than organic oils, with Kascher and Atmos being amongst the more popular types. Conventional defoamers can come in liquid or powder form, and the method of application also differs, ranging from cups, drippers and automatic pumps or to manual additions as needed. Choice is typically dictated by the size and style of evaporator and what is available through the supplier of choice.

Besides organic, some defoamers are also Kosher or Halal. This is more important for bulk producers as buyers need to certify that their offerings meet the necessary qualifications to be labeled as such.

Research over many decades has been done to find active or passive mechanical means to break up foam. Some interesting examples can be seen occasionally in museums or patent filings. Most of these devices were only modestly effective but added complexity to the process and did not eliminate the need for chemical defoamers. A prototype active spray defoamer developed at the UVM Proctor Maple Research Center can be seen at: https://www.youtube.com/watch?v=rldEWuCeGcE One simple approach to defoaming is to use a stainless wire cloth (1/4" mesh works well) laid across the partitions in a pan. While this doesn't completely remove the need to use chemical defoamers, it does help to break up bubbles and reduce the need for excess defoaming.

Lastly, since most chemical defoamers are oils, they will spoil and go rancid over time and with exposure to air, especially at high temperatures, so should be replaced often. Extra defoamer should be kept frozen (or following the manufacturer's instructions) and only small amounts for daily use taken out as needed. Tasting the defoamer before the season will help to prevent a spoiled batch of defoamer ruining your syrup.

A more thorough discussion of defoaming is available in the North American Maple Syrup Producers Manual and at: https://mapleresearch.org/search/?_sf_s=defoamer

Governor Eric Holcomb (center, alongside sugarmakers John and Delores Smith of Huntington, IN) visited the Indiana Maple Syrup Association's sugar shack at the Indiana State Fair