

## **Lavender Essential Oil Distillation Best Practices**

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Distilling lavender into oil is a time-consuming practice, so it is important to ensure you are doing it properly and getting the most out of the process. Over the years OMAFRA and the University of Guelph with funding from the Ontario Lavender Association and OMAFRA have conducted several trials to look at the optimal harvest timing, harvest practices, the length of the run, and their influence on oil yield and quality. Based on those trials, here are some best practices for lavender oil distillation.

### **Harvest Timing**

Oil yield increases up to the peak of bloom and then only gradually decreases from there. Peak bloom of a cultivar is about 2 weeks after the first blooms open and can be evaluated by looking at 10 randomly selected blooms and counting the number of buds that are past bloom and the number of buds that have yet to open. Peak bloom is when those two numbers are roughly equal. While we did not assess yield after bloom, it is likely that oil yield and quality continue to decline slightly each day beyond bloom. Some cultivars drop their buds after bloom, and this will greatly decrease oil yield. In rainy weather, mold could set in and cause a much greater decline in oil quality.

For agritourism, most growers wait until after bloom to harvest for oil to ensure a long agritourism season. This practice is fine for getting good yield and quality of oil, but keep in mind that oil yield and quality will decline slightly for each day you wait to harvest, especially in rainy weather.

### **Harvest Practices**

Previous work has shown that lavender leaves will decrease the quality of oil, so it is important to avoid harvesting leaves with the flowers as much as possible. We have also conducted a study to look at how much stem to include with the lavender. We compared cutting off as little stem as possible to leaving about 20 cm of stem below the flower cluster. The thought was that a grower could pack more flowers into the still without the stem, which would be more labour efficient. While cutting off the stems results in more oil per distillation run, leaving the stems on increased the amount of oil extracted per flower. As a result, to get the most oil out of your field and increase the speed of harvest, it is best to leave some stem on. The stems allow for more air spaces around the flowers, which improves the penetration of the steam to all the flowers in the still. It is important to pack the still evenly, especially around the perimeter to ensure the steam does not have channels to easily bypass the flowers.

## How Long to Run Each Batch

We have also conducted research on the amount and quality of oil through a distillation run. Every distillation unit is going to differ in how long it will take to go through a run. Generally, the larger the unit, the longer it will take to extract the oil. However, all stills will likely have a similar pattern of oil extraction. The following conclusions apply to a 40 L (10 gallon) stainless steel still, with oil yield and quality evaluated every 10 minutes for 1 hour after the flow of oil began:

- Oil yield was highest in the first 10 minutes and then decreased, with 90% of the oil extracted in the first 40 minutes.
- Oil quality declined steadily for each 10-minute batch, with poor quality oil beyond 40 minutes.
- It is best to run a few practice batches to ensure you know how long it takes to extract all the oil. After that, for premium oil and to ensure your time is not wasted extracting small amounts of poor-quality oil, it is best to stop the run when 90% of the oil is extracted or collect the last 10% of oil separately to use in products where optimal oil is less important (e.g. candles, personal care products).

There are also a lot of questions around the use of copper vs stainless steel stills. There is not a lot of research to compare these two types in terms of oil quality. Copper will react with some volatile compounds in the oil, if present, such as off-smelling sulfur compounds, making the oil less pungent. Aging the oil also mellows some of these pungent compounds, but in a different way. As an alternative to buying an expensive copper still, you can achieve the same results by pouring the oil through some copper wool or through thin copper tubing. In my experience, as long as the flowers are fresh and harvested at the right stage, the oil extracted from stainless steel or glass stills is of good quality with no pungency issues, but aging the oil can make it a bit more mellow.

For more information on handling the oil after it is extracted, refer to the presentation by Dr. Jim Todd of OMAFRA on oil handling best practices on the members only section of the OLA website [here](#).