

ITI technology for the Southern Province for distilling essential oils - part 2

02/12/99
Daily News

by Nalini Amarasinghe

Manager - Pilot Plant Process and
Plant Engineering Division
Industrial Technology Institute

(Continued from yesterday)

In the still it is necessary to have even distribution of steam over the whole cross section of the charge. In the existing stills an uneven distribution of the steam was yet another shortcoming that was observed. In the ITI still a steam sparger was specially designed to overcome this problem. Further to reduce heat loss and reflux of vapour, the new still has been insulated with glass wool.

The existing method of removing the charge from the still after distillation is complete by removing each bunch with a special fork while the material is hot. This is time consuming as well as unsafe. In the ITI still the unloading of the spent material has been made easy by lifting the entire packed bed with the grid bottom using a hoist.

Condenser - From the still the steam carrying the volatile oils is directed to the condenser. The existing method of a submerged coil type condenser consisting of a single tube of approximate length 100 to 150 feet was replaced by a more efficient shell and tube type condenser consisting of several tubes each of approximate length of seven feet. In this condenser the high degree of turbulence in the cooling water leads to more efficient condensation. This method also required a lower residence time of the steam and oil mixture in the condenser. This low residence time also results in higher quality oil.

Since running water is necessary for the new system an overhead tank and a spray pond have been built for cooling the water and reusing the water. The temperature of the condensate is important in the separation of oil from water. The water cooling system and the design of the condenser in the new system ensures the maintenance of the condensate temperature below 35 °C

even if the plant is operated for a continuous period of 24 hours. In the existing system the temperature of cooling water in the static tank continuously increased thus allowing for a temperature increase of the condensate and an escape of uncondensed steam and oil vapours. This resulted in a low yield of the final product.

Oil Separator - The oil separator has to perform the crucial function of separating the essential oil, from the condensed water. A special oil separator was designed and fabricated by ITI to remove both light and heavy oils taking into account design parameters such as velocity reduction of the condensate, easy separation of oil and water, collection of oil without disturbing the process and holding volume to provide sufficient residence time for separation.

Transfer of technical know-how

The ITI commenced the transfer of know-how for the distillation of Cinnamon leaf, Cinnamon bark and Citronella oil in September 1999 with the plant and machinery designed and fabricated by the ITI incorporating the modifications as mentioned earlier. The Southern Development Authority provided financial assistance of Rs. 2.1 million for the plant and machinery to the ITI. The factory that has now been set up at Kamburupitiya for Cinnamon leaf and bark oils serves 200 members of the Cinnamon Small holders Public CO. Ltd., who own approximately 3000 hectares of the Cinnamon cultivation in the area. Deputy Ministers Monty Gopallawa and Dallas Allahaperuma declared this factory open on September 1, 1999.

Similarly a Citronella oil distillation unit supplied to Katuwana and officially opened on October 24, 1999 by Deputy Ministers Chamal Rajapakse and Nirupama Rajapakse now serves the members of the Citronella Smallholder People's Company in the Hambantota District.

The entire project comprising the two factories was completed within four months.

ITI officers participated as resource persons in a workshop organized by the SDA and the Department of Export Agriculture on October 21, 1999 to educate the industrialists in the Matara District on the field of Cinnamon leaf and bark oil distillation and to introduce the new technology. A similar workshop was held on November 18, 1999 for the Citronella oil industrialists in the Katuwana area.

A workshop on Cinnamon leaf and bark oil distillation will be held shortly for industrialists in the Galle District. The industrialists

have now realized the shortcomings in the traditional method and are keen to upgrade their existing plant and machinery for better yields and high quality oil.

ITI will continue to assist the industrialists individually via the SDA in modifying their stills and providing trouble shooting and consultancy services.

The ITI has now commenced work on setting up of the third factory at a cost of Rs. 1.5 Million for the distillation of Cinnamon leaf and bark oils at Karadeniya with financial assistance from SDA.

(Concluded)