Honey House Plant for Handling Manuka Honey

HONEY produced from manuka (*Leptospermum scoparium*), or tea tree, has properties not generally found in other honeys. Though colour, flavour, and consistency may vary widely, depending on the locality from which the nectar is gathered, the bulk of the crop from this source presents many difficulties to beekeepers in extraction, straining, and conditioning. In this article C. R. Paterson, Apiculturist, Department of Agriculture, Hamilton, and D. Roberts, Apiary Instructor, Department of Agriculture, Auckland, outline plant and methods of operation which will enable beekeepers in manuka areas to obtain the maximum extraction and to produce this honey in its most attractive and saleable form.

MANUKA honey as stored by the bees is usually a light amber and has a distinctive flavour. A condition peculiar to this honey is its thixotropicity or jelly-like consistency. It is this condition and the susceptibility of the honey to damage from heat which are responsible for the difficulties experienced by many beekeepers in extracting, straining, and packing manuka honey. It is reputed to be similar in these respects and that of flavour to the much publicised heather honey of England and Scotland. Colour, flavour, and consistency, however, may vary within fairly wide limits, depending on the location from which the nectar is gathered. Experience over the years has shown that plant and technique can be developed to extract and process this type of honey satisfactorily. By using approved equipment and the proper technique many beekeepers are finding that they are now able to extract manuka honey cleanly from the combs, obtaining in some instances well over 35lb. per super.

Equipment Required

The plant and equipment required are as follows:—

Hot Room

Manuka honey can at times be extracted in the ordinary way immediately after it is removed from the hives, but a considerable amount will always remain in the combs and it is doubtful whether the quantity secured justifies all the labour that goes into extracting. To enable the maximum amount to be removed from the combs by ordinary extraction methods pre-heating of the honey for approximately 12 to 24 hours is recommended. This is done by warming the honey to a temperature of approximately 90 to 95 degrees F. in a hot room. Care has to be taken not to allow the temperature to exceed 95 degrees, as otherwise the wax combs are likely to break down.

The hot room is essentially a closed compartment properly insulated with one or two layers of wallboard. This is generally sufficient to maintain the heat at the required temperature. A ¼ h.p. electric motor and suitable fan circulate the air over a 2000 watt electric element. The motor and element are controlled by a thermostat. When the temperature is raised to the required 90 to 95 degrees the unit cuts out and does not come in again until the temperature begins to drop. Once the room is warmed up the unit generally runs for 5 to 10 minutes and then cuts off for 20 to 30 minutes, depending on the efficiency of the insulation.

The hot room should not be larger than required by the individual beekeeper. The plan of honey house layout on page 130 gives a size for 80 to 90 supers. The supers should be placed in the hot room as soon as possible after removal from the hives and before the honey cools. Drip trays are essential and supers should be placed in the room so that each pile has several inches of air space around it. This allows free circulation of warm air around the supers. Some beekeepers find that the staggering of each super in a pile is an improvement.

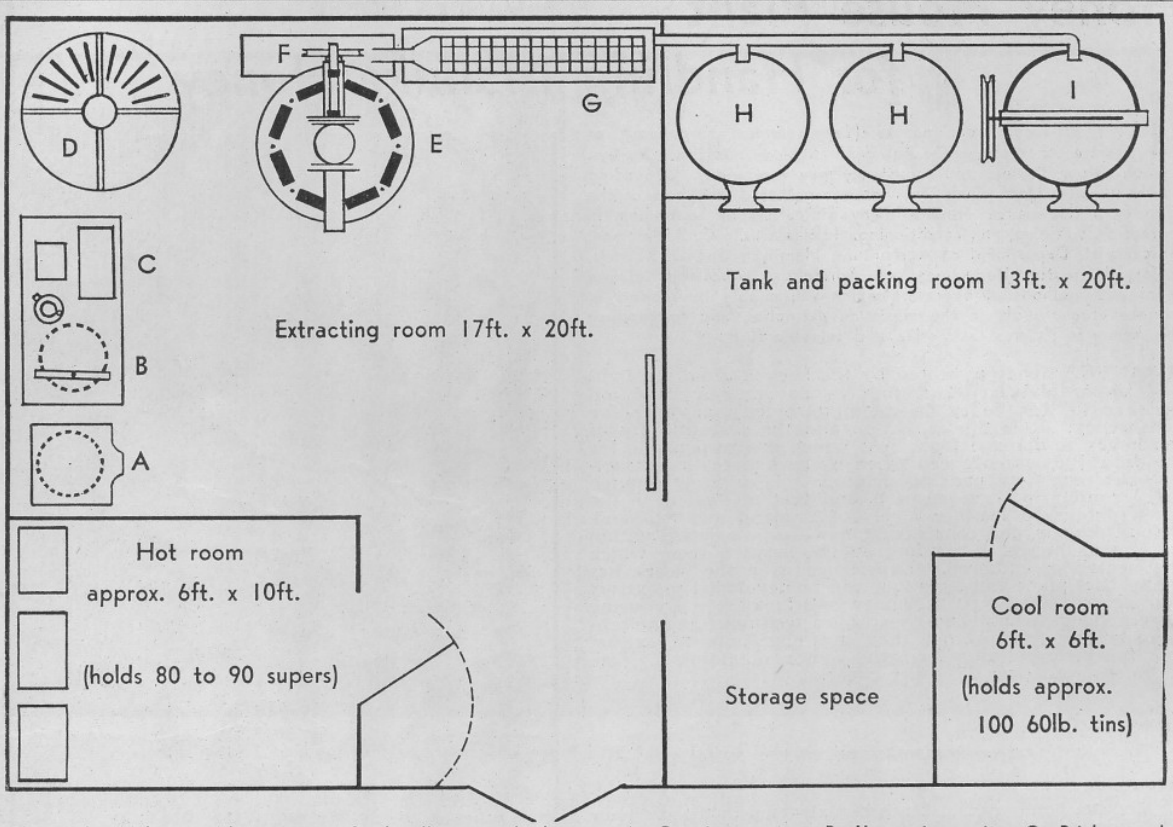
Experimental work carried out recently has shown that a limited degree of drying can be effected in hot rooms provided some fresh air is allowed into the compartment. This can be done by making a small opening (about 3in. x 3in.) near the floor on the wall nearest the heating unit. This opening can be fitted with a slide to allow control of fresh air going into the hot room. A similar opening and slide should be made near the top of the wall opposite the heating unit as an outlet.

The admission of fresh air will require the heating unit to run longer; also the humidity of the introduced air will govern the amount of drying effected in the hot room.

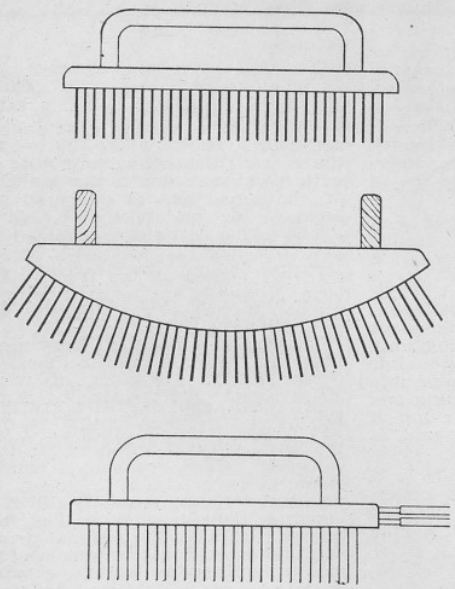
Uncapping

Uncapping is carried out in the usual manner with either the steam-heated knife or the Rosedale plane. The honey taken off with the cappings has then to be disposed of. The general practice with other honeys is to apply extra heat to encourage the rapid separation of the honey from the wax. This method cannot be used with manuka honey, as the application of additional heat is likely to cause serious deterioration of flavour. Pressure has therefore been found to give the most satisfactory results in securing the maximum amount from the cappings. The following is a description of the cappings press recommended for manuka honey:—

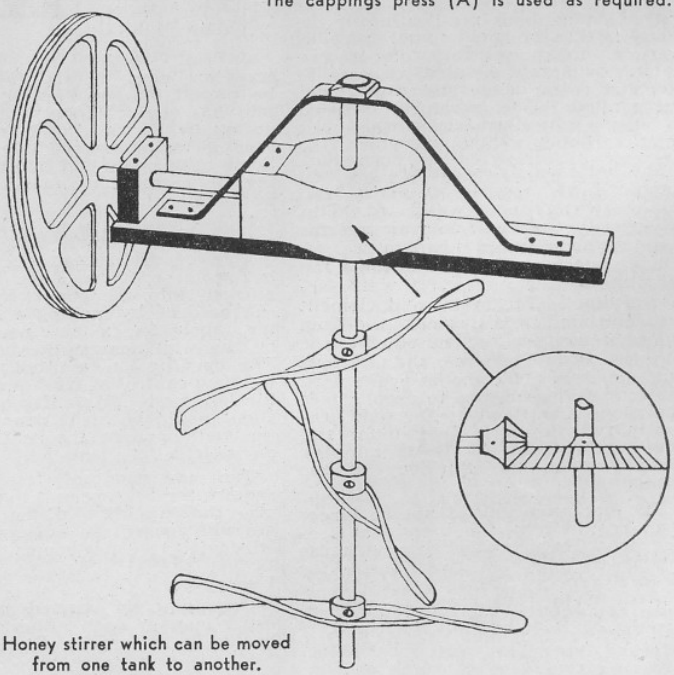
The press is built on very similar lines to the well-known hatch wax press, but the cylinder of wooden strips is not held together by a metal container but by two narrow metal bands which can be unscrewed when the pressed cake of wax is to be released. These wooden containers stand in trays about 6in. deep. Immediately the container is filled with cappings, pressure is applied by a powerful jack, or a continual pressure can be exerted by a long weighted arm. Two or three of these wooden containers are required so that while one is being pressed the others can be filled up with cappings. The operator should always endeavour to



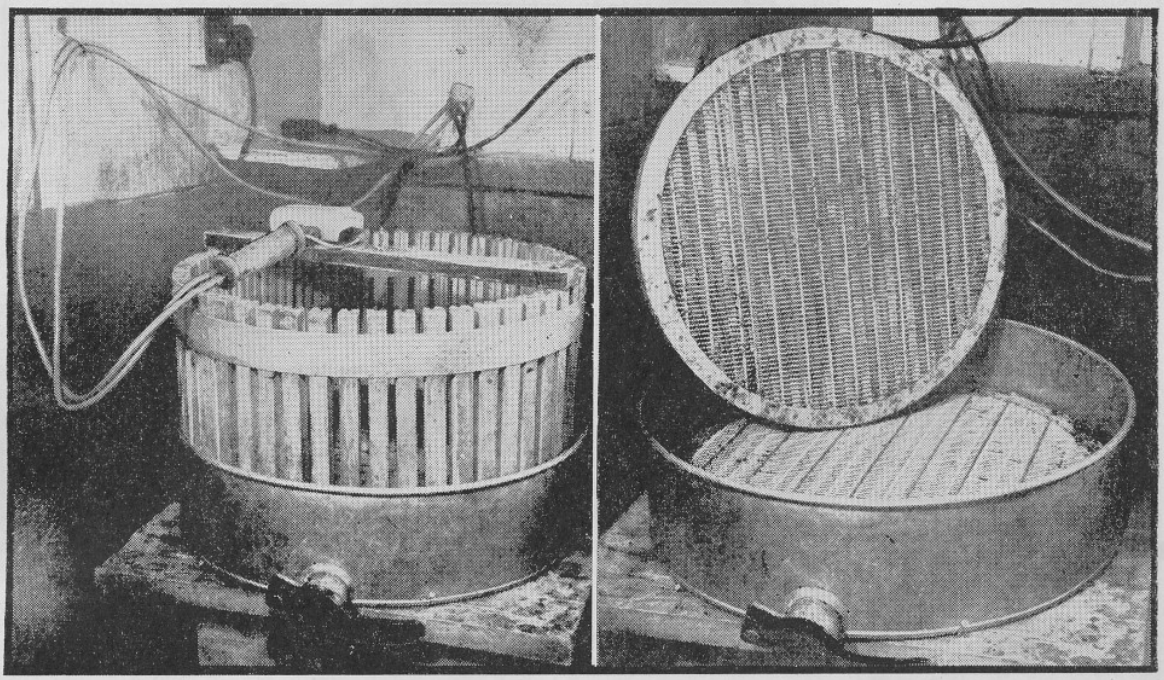
Plan of honey house with equipment for handling manuka honey. A—Cappings press. B—Uncapping unit. C—Pricker pad. D—Circular comb holder. E—8-frame extractor. F—Pump unit (motor at left). G—Cylindrical strainer. H—Storage tanks. I—Movable honey stirrer. The method of working is from the hot room through B, C, D, E, F, G, H, and I to the cool room. The cappings press (A) is used as required.



Types of pricker pads. Upper—Flat type. Middle—Rocking type, which covers the comb in one operation. Lower—Steam-heated type, which can go right through the comb.



Honey stirrer which can be moved from one tank to another.



Left—Uncapping press, showing basket and tray. Right—Holding tray with top and bottom grids.

press while the cappings are still warm. The general construction and set-up of this type of press are shown in the illustrations above and at bottom left on page 133.

Pricker Pad

The extractor will not remove manuka honey satisfactorily unless the combs are first subjected to the effects of what is usually called the pricker pad. This implement breaks up the jelly-like consistency of manuka honey, thus allowing the extractor to carry out its particular work. The pricker pad is simply a holder which has numerous metal spikes on the under side. A more apt title for this piece of equipment would be "beekeeper's hedgehog", as it looks uncommonly like the back of this animal.

After the comb has been uncapped it is laid on a wood block and the spikes of the pricker pad are pushed into the honey. When one side is done the comb is reversed and the other side subjected to the same treatment. As considerable pressure is required, it has been found desirable not to make the pad too large. One that will cover a comb in four strokes appears to be a good size. There are several designs in use and a brief description of three types follows:—

Small flat type: This type of pad sometimes rests in a small tray of hot honey. This keeps the metal spikes warm and reduces the effort required in pressing the pad into the comb.

Rocker type: This was designed to cover a larger area of comb at one time and also to reduce the suction effects on the spikes when the pad is being withdrawn.

Both the small flat type and the rocker type give quite satisfactory service but tend to damage the combs. Beekeepers operating in manuka areas will have to make fairly heavy replacements of combs each year or keep the worst of them above excluders.

Steam-heated pad: In an effort to prolong the life of combs several beekeepers are using the steam-heated pad with very thin spikes. The slender spikes, aided by the heat from the steam jacket, easily go down into the honey and can be pushed right through the midrib of the comb, thus eliminating the necessity to do the other side. Combs may last longer when this type of pad is used, but it is not satisfactory on old, tough combs, as the spikes are too light to pierce the hard centres.

Extractor

The full reversible basket type honey extractor is the most satisfactory for dealing with manuka honey, as the combs need to be rotated at the maximum speed consistent with safety from damage and require the support of good, sound baskets. It is also an advantage to pay particular attention to the wiring when the frames are first being assembled and to make sure that the wire is tight and well tacked to the frame. Four wires instead of the usual three are a decided advantage in helping to keep the comb in one piece. Use of a radial machine with this type of honey entails the risk of losing most of the combs. A semi-radial appears to give better results, but is still not as suitable as the common basket machine for extracting manuka honey.

Pump

A type of pump specially suited for pumping honey should be used. Though the cheaper cog pump will pump honey, it is not completely satisfactory. Manuka honey generally contains a considerable number of wax particles and air bubbles after extraction because of the action of the pricker pad. The wax becomes broken up into tiny particles when crushed between the cogs in the cog type of pump. Also the cogs appear to aerate the honey to a much greater extent

For Reference

MOST of the equipment mentioned in this article has already been fully described in the "Journal" at various times. Fuller details on particular items may be found in the following issues:—

Cylindrical honey strainer, April 1951, p. 335.

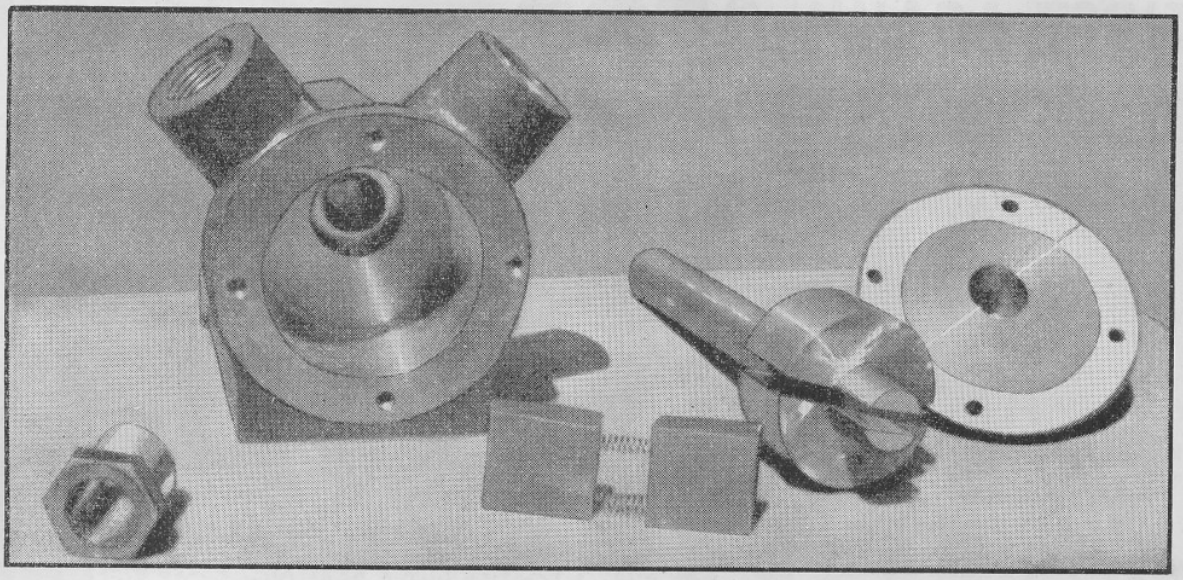
Honey pump unit, April 1950, p. 341.

Hot-room heating unit, October 1950, p. 315.

Mechanical stirrer, May 1950, p. 435.

Steam-heated pricker pad, November 1950, p. 421.

Uncapping press for manuka honey, June 1951, p. 482.



Type of pump especially suited for pumping honey.

than does the proper sliding vane type honey pump.

Strainer

In the past one of the greatest difficulties encountered by the beekeeper in handling manuka honey was the straining. This was a problem because of the jelly-like nature of the honey and the excessive amount of wax particles. Ordinary strainers which worked quite efficiently with the usual types of honey were found unsatisfactory for manuka. Endeavours were made to short-circuit straining to a certain extent by leaving the honey in settling tanks in warm insulated tank rooms and skimming it.

However, Mr. G. B. Sharp, of Matakana, Northland, appears to have solved the problem of straining manuka honey by devising a special type of cylindrical strainer. Several are now in use and giving most satisfactory results. The capacity of the strainer is such that it will deal with all the honey that a beekeeper can extract in one day. Its success is attributable to the large straining area provided and in the method of use.

The strainer is cylindrical and 4ft. long by 1ft. in diameter, providing a straining surface of approximately 12 sq. ft. The strainer is supported on two cradles, which rest in a tinned steel tray 5ft. long, 1½ft. wide, and 3in. deep. The tray and strainers are given sufficient inclination to cause a fall of 3in. in the total length. It is used as follows:—

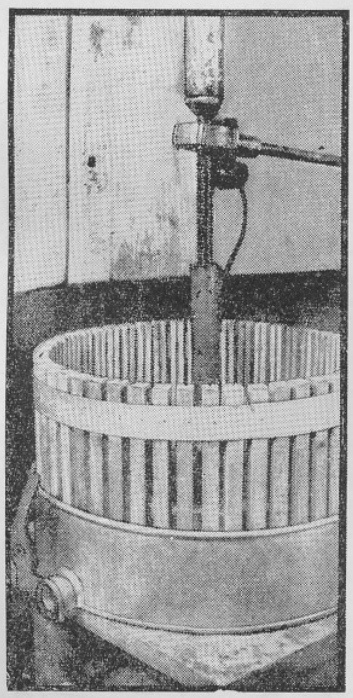
Honey is pumped from the extractor into the open end of the strainer, where it flows through the mesh into the tray. As soon as one portion of the strainer becomes blocked, the strainer is given a portion of a turn to bring a fresh section of gauze into use. Once the whole surface has been used and a considerable amount of wax particles have collected the cylinder is given a quick half turn. This has the effect of bringing the rubbish to the top of the straining cylinder, when its own weight breaks it loose from the surface. It does not obstruct further free straining for some time. A full description of this strainer can be found in the April 1951 issue of the "Journal".

Storage Tanks

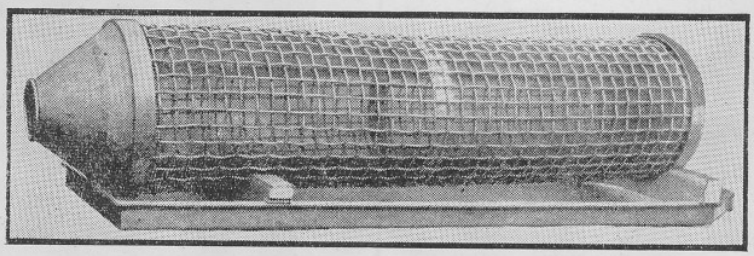
The honey from the cylindrical strainer is run direct into the settling or storage tanks. These should be in a suitable handy room that is well lined so that the honey will be stored under the driest possible conditions. Owing to the nature of manuka honey very little is to be gained by leaving the honey in the settling tank for any odd particle to rise to the surface. It is much better to begin packing as soon as possible.

Mechanical Stirrer

To prepare manuka honey for marketing in its most attractive condition some processing of the honey will be required. This should be anticipated by the beekeeper and he



Applying pressure to cappings by a jack. A long weighted arm can also be used.



Cylindrical strainer. Honey enters at the cone-shaped end.

should have a supply of good, smooth-grained starter honey on hand. Though 5 per cent. of starter is perhaps sufficient for normal New Zealand honey, it is best to use a little more than this for manuka honey to get it to granulate as quickly as possible. The speed of granulation governs the quality of the grain.

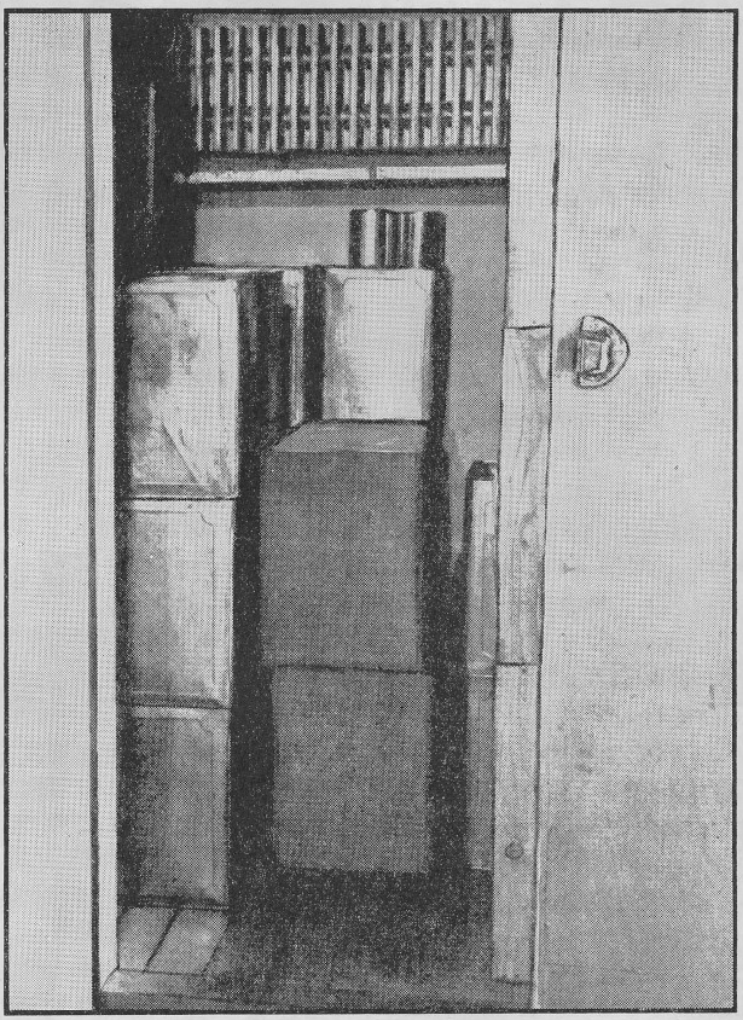
As the stirring of this amount of honey into the heavy-bodied manuka honey by hand is rather laborious, mechanical means should be adopted. A honey stirrer is shown in the bottom right diagram on page 130. This type can be moved from tank to tank. It is necessary to see that the stirring blades are firmly fixed to the centre spindle. This is done by set screws if the blades are of metal or by pinning the blades to the shaft if wood is used. The starter honey should be thoroughly incorporated before filling into 60lb. tins is begun. One or two hours of stirring will be ample. By this method it will be possible to have the honey tinned the day after extraction. Working on these lines reduces the number of storage tanks and the size of the tank room required.

Cool Room

The extraction of manuka honey generally takes place during the warmest part of the season and when there are very few cool nights. Warm temperatures retard the quick granulation of honey, and rapid settling of the honey is required if a smooth texture is to be attained. To secure temperatures most suitable during the warmer periods refrigeration is necessary. Cool rooms of the smallest capacity consistent with the quantity of honey being handled are not difficult to construct, the most expensive item being the refrigerating unit.

The handling of manuka honey in 60lb. tins gives the beekeeper the opportunity of making full use of the smallest refrigeration unit. In a room of approximately 6ft. x 6ft. x 6ft. 6in. high well over 100 60lb. tins of honey can be cooled at one time if necessary. Cool rooms are generally constructed within the existing honey house in some suitable corner. The inside of the walls, ceiling, and floor should be first covered with light tarred roofing material, care being taken to make sure that all joins are completely sealed. This ensures an impervious moisture barrier to the outside air. The insulation material is then put on and can consist of slabs of 2in. cork or several layers of soft-board. If the latter is used, small air spaces between each sheet must be allowed for by means of thin slats of wood. The insulation on the floor can be covered with flooring boards so as to give a firm surface for stacking the honey. The sides and ceiling, if cork has been used, can be covered with hardboard sheets and painted a light colour.

A $\frac{1}{3}$ h.p. refrigeration unit will be required and should be installed by a refrigeration engineer. A temperature of only 50 to 57 degrees F. is required and the well-stirred honey after being in this cool room for 5 to 10 days will have set firm and be in good condition for marketing. It is unfortunate that this expense is necessary when the unit will be in use for only a few weeks throughout the year. However, some beekeepers may be able to avoid this outlay if they happen to be handy to an industry which uses cool storage and is prepared to allow the beekeeper to make use of it for a nominal charge.



Cool room containing 60lb. tins of honey.

Sequence of Handling

The following procedure has to be carried out with the equipment described:—

1. Capped combs are placed in the comb warming room for about 12 to 24 hours. Temperature is controlled at 90 to 95 degrees F.

2. Combs are uncapped by the usual method. Cappings should be pressed immediately to take advantage of the heat that is in the honey from the warming room.

3. Combs are pricked. If the special steam-heated pricker is used, this goes right through the midribs into the cells on the under sides of the combs. This eliminates the need of reversing the combs and prevents much of the damage to combs that occurs when the other types are used.

4. Honey is extracted in the usual way, perhaps with the extractor running a little faster than is usual for ordinary honey.

5. Honey is pumped up through a cylindrical honey strainer. The strainer is given a turn round in its cradle at frequent intervals. Experience will tell how often.

6. Honey goes into the storage tank; make sure that it runs down on the side to prevent undue aeration. Keep a tight-fitting lid on the tank during all times that honey is in it.

7. Next day the required amount of starter honey is stirred in, preferably by mechanical means. Continue stirring until incorporation of the starter is complete. The time will depend on how quickly the honey appears to thicken up.

8. Containers are filled and immediately placed in the cool room (approximately 54 degrees F.) and left there until the honey has set.