THE

N.Z. HONEYBEE

A JOURNAL DEVOTED TO THE INTERESTS OF BEEKEEPERS

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How to Secure Smooth Grain—Part IV

By P. A. Hillary

Sucrose (Cane Sugar)

Cawthron Bulletin, No. 25 states that this sugar, which is identical with the ordinary sugar from cane or beet, is present in honey in amounts from 0 to 10 per cent. In New Zealand honey the average amount of sucrose present is 2.8 per cent. In the only New Zealand lucerne honey examined the sucrose content was 4.8 per cent. The presence of sucrose in honey is due to the fact that some of the original sucrose in the nectar has not been broken up into the two simpler sugars. The conversion of this residual sucrose into dextrose and levulose proceeds slowly in honey, and analyses of a honey made over a period of years show a gradual decrease in the sucrose content with a corresponding increase in the dextrose and levulose contents. Sucrose, unlike dextrose and levulose, has not the power of reducing metallic compounds and so is not classed as a reducing sugar.

Some flowers yield nearly all invert sugar and others chiefly sucrose, but the latter case is rare, states Whitfield. The sucrose present in the nectaries of flowers is mostly inverted by the bee, but when bees are fed or have access to cane sugar, a very considerable proportion is found in the honey. The enzyme invertase, always present in a normal honey, gradually transforms any sucrose present in the fresh honey into invert sugar (a mixture of D. glucose or dextrose, and fructose or levulose), so that cane sugar (sucrose) gradually tends to disappear as the honey gets older. Heating to 140 degrees F. kills the enzyme. The phenomenon of "frosting" or "dry granulation," may be bound up with the gradual production of dextrose which, under these conditions, crytallises out in the anhydrous form, and gives the appearance of frost-like or cauliflower-shaped growths forming throughout the mass of normal hydrated dextrose crystals.

The studies of honey and nectar by Bosch, Fulmer, and Park showed that the levulose-dextrose ratios were reasonably constant for various samples from one particular plant, but were different for different species of plants. When bees make "honey" from sucrose, levulose is then in excess. The bees either use some of the dextrose in the process of inversion and storage, or else dextrose is somehow converted into levulose. If a mixture of equal parts of dextrose and levulose is fed to bees, the ratio is not changed.

Minor Constituents

The principal members of this group are acids (0.08 per cent) and nitrogen compounds (0.25 per cent.). The remaining constituents are mineral matter (salts, etc.), wax, pollen, extraneous substances and those organic compounds which give honey its bouquet and flavour.

The acids in honey were at one time thought to consist mainly of formic acid, the old theory being that the bee injected formic acid into the comb cell with its sting to act as a preservative. More exact investigations have revealed that formic acid is not necessarily the principal acid present in honey, for acetic and malic acids may be present in as large amounts as formic acid. Honey contains sufficient acid to class it definitely as an acid substance.

Mineral Matter

The amount of mineral matter present in honey shows very considerable variation. The quantity of ash left when honey is ignited is regarded

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SMOOTH HONEY

(Continued from Front Page.)

as a measure of the mineral content of the honey, and in New Zealand honey varies from 0.04 per cent. to 0.39 per cent. Included in the small amount of ash, analysts have identified silicon, phosphorus, sulphur, chlorine, manganese, iron, aluminium, calcium, magnesium, potassium and sodium in proportions which varied greatly with the source of the honey. Most of these elements present in honey are essential to a healthy life and their presence may partly explain the superiority of honey as a food over more refined sugars. The actual compounds in which these elements exist in honey are not known, but there is evidence to show that many of them form or are associated with the electrically-charged colloids in the honey.

Samples of Graded Honey

At the recent meeting of the Honey Control Board, it was resolved "That the Department of Agriculture be requested to instruct the grader to forward to the Board's office a two-ounce sample of every line of ten cases of honey or over which he grades, the sample to be numbered with the number of the grade certificate issued in respect to such line of honey."

It was explained that lines of honey are sometimes shipped to London before the producer receives his grade certificate owing to the exigencies of shipping, and any complaint made to the Board by the producer either is unable to be investigated or else entails the sending to London for samples of the honeys which are the object of the complaint. This latter course had been frequently adopted, but the months of delay and the trouble, and the alteration of the condition of the honey due to two trips through the tropics and the removal of the honey from a 60lb. tin and its pressing into a one-pound jar, had caused the samples to alter considerably from the original honeys sent in for grading; which, of course, made it impossible for the complaint to be accurately investigated. The suggested taking of samples at the time of grading will be a great improvement on the present method.

The Average Yield

The average yield per colony in Germany was estimated by Dr. Armbruster at 12.1 lbs., and in Switzerland it was put at 18 lbs by Dr. Levenberger.

Immunity Wears Off

The statement that bee stings have an accumulative effect is by no means incorrect but the effects greatly vary. In some persons it produces immunity, in others, sensitivity. Both conditionalities are based on accumulative effect. Beekeepers, as a rule by accumulative effect of the venom become immune to it and in time do not react to stings. Of course, every immunity wears off in time. Beekeepers, during the summer season, get immunized to stings and by autumn they hardly react to it. During the winter when they are not stung their immunity wears off and by next spring they are sensitive again to stings. The experience of Rev. Langstroth that he greatly suffered when he went back to his bees was undoubtedly due to the fact that his immunity during the "unexposed" period had worn off and he was sensitive again. Often enough during such an inactive period people acquire sensitivity and they can tolerate less stings than ever without suffering a local and general reaction. During my professional work with stings I often find such cases, that is, if a patient received a longer treatment after which there is a long interval, during which no treatments are administered, at the renewed application of stings they become so sensitive that while they could stand 50 and 60 stings during the active treatments, after a long interruption they become very sick from one or two stings. All this is due, beyond doubt to the accumulative effect of the previous stings.—Dr. B. F. Beck, in Gleamings.

A Gentle Strain of Bees

The celebrated apiculturist Daeke put forward four ways in which a gentle strain of bees could be obtained. They are as follows.—(1). Complete calm and confidence in manipulating. (2). Moderate smoking of the bees. Too much smoke makes the bees wicked. Those bees which are disposed to sting, are not found on the frames but on the walls of the hive. The smoke therefore therefore should be directed preferably on the walls. (3). Having the hive constructed so that no difficulty is experienced in manipulating. (4). Selection of queens whose workers are at the same time gentle and industrious, for one can find bees which are gentle and lazy.—Scottish Beekeeper.

"The advt. you inserted for honeytanks for us in the December issue brought gratifying results." —T. Bros., Waharoa.

News of General Interest

A Well-Deserved Honour

Beekeepers throughout the Dominion will have felt great pleasure at the appearance in the New Year honours list of the name of the Director of the Cawthron Institute, Mr. T. Rigg, who has had a knighthood conferred upon him.

Sir Theodore Rigg, who is a son of the late Mr. John Rigg, of Wellington, was born in Yorkshire in 1888. He had a brilliant scholastic career in New Zealand, and at Cambridge, England. During the war he served with relief units (in France, Montenegro and Russia) organised by the Society of Friends. In 1919, after periods of special work on soils in England and U.S.A., he returned to New Zealand, was appointed to the staff of the Cawthron Institute, and, after the retirement of Professor Easterfield, became Director.

Sir Theodore was elected a fellow of the Institute of Chemistry of Great Britain and Ireland in 1922, and has been a member of the New Zealand Council of Industrial and Scientific Research since 1926. In 1927 he was appointed New Zealand delegate to the International Soil Congress in U.S.A., and the Imperial Agricultural Conference in England.

Sir Theodore has taken a keen personal interest in the problems of the beekeeping industry, and has been responsible for research work of a most valuable nature regarding New Zealand honeys. Special equipment is now on its way to the Dominion to enable the continuation of tests concerning dark and strong-flavoured honeys. A wide view and a spirit of enthusiasm and sympathy have characterised the work at Cawthron Institute, and have won the esteem and confidence of the whole industry, which is glad to be able to extend to Sir Theodore its sincerest congratulations upon a well-deserved honour.

Cost of Brood Production

It has been proved in a general way that about 30lbs of honey, when active brood-rearing begins in the spring, will make 10lbs. of bees. If the bees gather some nectar, there will be a surplus from the 30lbs; if not, very little of the 30lbs. would remain. Bees are worth at least 3/- a lb. to buy. The three pounds of honey necessary to rear one pound of bees, if extracted and sold, would not bring more than 1/-. It is good business to leave sufficient stores on the hive, where it is worth three times the amount it could be sold for.—American Bee Journal.

A Correction

Mr. H. R. Penny, of Taranaki, one of the Dominion's most outstanding honey producers, whose integrity is above question, writes that a statement had been made by certain beekeepers and had also appeared in a leading paper to the effect that he had stated that "Producers as a whole were in ignorance of the proposed legislation, and that our Association was under no obligation to enlighten them." Mr. Penny asserts that what he had stated was "Our Association was under no obligation to enlighten beekeepers outside our membership."

Scottish Marketing Scheme

The Scottish Beekeepers Association, has organised a marketing scheme. Once the crop is in sight the Marketing Committee fixes a minimum price for honey, which is duly made known to 1,600 members through the local secretaries, numbering over a hundred. If any beekeeper cannot get the minimum price—or more—for his honey he is put into touch with one of the beefarmers, who will buy his honey for at least the minimum price. The smaller beekeeper's few hundredweights of honey then become part of a much larger consignment, despatched probably to some big industrial centre. As a result, Aberdeen shops no longer offer the cheapest honey in Britain.

Hawke's Bay Field Day

In spite of unfavourable weather conditions, the beekeepers who attended the field day on December 11, at Mr. A. Lowe's apiary, "Sunnybank," Hastings, spent a pleasant and profitable afternoon.

Demonstrations were given by Mr. L. Riesterer, Apairy Instructor, and Messrs. J. N. Walker and H. Shepherd, while Mr. Lowe set forth the advantages to be gained by beekeepers linking up with the Association, so that all might work together for the common good.

Mrs. Lowe and her daughters dispensed a much appreciated afternoon tea.

At the close of the field day, a very hearty vote of thanks was passed to Mr. and Mrs. Lowe for their hospitality.

The next Hawke's Bay field day is to be held on February 5th at Mr. Donkins apiary, Havelock North.

"Please send me an extra September issue. I wish to get the article on smooth grain; a difficult point this, to a beginner, I find."—H.D.S., Banks Peninsula.

The Successful Production of Honey—Part IV

By P. A. Hillary

Grading of Combs

The wire for frames should be of rustless material. The dampness of our climate causes tinned-steel wire to rust through at the ends of the frames spoiling scores of combs every season. "Wired foundation" is a superior article. Many beekeepers in the Dominion now get their wax manufactured into foundation and then make their own wired foundation which is later fixed in the frames. The combs are immeasurably stronger than those made with the ordinary four embedded wires, and stand a great deal more strain and abuse.

It is essential that beekeepers should take every care to get perfect worker combs built. In "Gleanings," Mr. E. S. Miller states:

"A 'perfect' comb contains only worker cells and is built down to the bottom-bar throughout the length of the frame. To secure perfect combs they should be drawn out above the brood, not in the lower storey. Foundation drawn out in the brood chamber is seldom built down to the bottom bar. To operate colonies without queen excluders means poor combs and damaged combs. Bees in a colony always repair a comb with drone cells."

This is quite correct. A "perfect" comb contains only worker cells. A "good" comb contains less than two per cent. of drone cells, which means a total of one-fifth of a comb (both sides) of solid drone brood in a 10-frame hive body. This is a generous loss to provide for. Combs with over 2 per cent. of drone cells should be classed as "poor," and be prohibited from use in the brood chamber.

After every season, beekeepers should make it a particular duty to examine every comb and sort them into four grades—(1) perfect; (2) good; (3) poor, and (4) rejects. This saves an immense amount of time during the rush of the season. Also it enables the rejects to be melted down, and the wax converted into foundation for use in making frames of foundation for the flow.

Dry, Airy Hives

It is imperative that the bees have a dry, airy hive in which to live. The first essential is a dry gently-sloping site, facing north-east; the second, waterproof supers and covers; the third, a bottomboard raised sufficiently high off the ground to prevent rompness penetrating through to the broodnest; and fourth, the continual clearing of all growth from around the hive. It is quite a common thing to see hives situated on low-lying ground that becomes wet and swampy in winter, with bottomboards on the wet tufts of grass around the hives high off the ground to prevent damp keeping the brood-chamber dripping with dampness for months during the bad weather. The interior of the hive can well be imagined. If opened up, it would reveal a most filthy condition—wet, mouldy combs with mildewed polien and fermenting honey, myriads of woodlice that thrive in damp surroundings and that eat the combs and the wood of the hive and foul the hive and bottomboard; also loathsome slugs; and other insects.

The bees suffer just as animals do, from lowered vitality, when living under such conditions. They dwindle in strength and numbers, and when the spring opens they are almost useless as an efficient honey-gathering unit. They are weak physically and in spirit; they are slow to react to the call of the new season; they are unable to perform the vigorous work necessary to ensure the health and tone common to a well-wintered colony, and to raise vigorous young bees.

The method of erecting stands used by Mr. A. R. Bates, of Kaponga, is the simplest and best, and the cheapest that could be devised. Four macrocarpa pegs are driven into the ground projecting about 9 or 10 inches, the pegs having first been dipped in hot tar. Two pieces of 3 x 2 heart timber at least 4 feet long are nailed parallel on the pegs, and two colonies are then placed on this stand. With waterproof hives, this gives the bees ideal wintering conditions, enabling them to keep stronger on less stores than does any other method. And as the production of brood (i.e., bees) is the main object of at least nine months of the year's work, the well-wintered, vigorous colony is an undoubted asset, whilst the badly-wintered, weakened one is a decided liability.

Freedom from Disease

Freedom from bee diseases is vital to high efficiency in honey production. The disease most to be feared in this country is A.F.B. (American Foul Brood), which is extremely contagious. It seriously affects brood production, and eventually causes the extinction of the colony, with the spread of the disease to others. The only safe cure is to dig a hole and burn bees, frames and hive, and then to bury the remains. Treatment by the shaking method is **NOT** a safe cure—it is unreliable.

Market and Crop Reports

Honey Crop Prospects

The Department of Agriculture has received the following reports from Apiary Instructors concerning honey crop prospects at the end of December, 1937:

AUCKLAND: The season promises to be well above the average for all classes of honey in the Auckland districts. The clover is yielding well and the pohutakaka exceeded expectations. It has been the best season for some years.—G. V. Westbrooke.

HAMILTON: Extracting operations are in full swing throughout the district, and in many places returned supers are almost full again. Clover pastures began to dry up a short while ago, but recent heavy rains and warm temperatures have brought on the clover to a remarkable degree. The fields are again white with clover bloom and weather conditions remain very favourable for the bees. Crops will be heavy throughout the whole district.—T. S. Winter.

HASTINGS: In Hawkes Bay and East Coast districts, suitable conditions have prevailed for nectar secretion. Rain would be beneficial but the general indications are that a good season will be experienced.—L. Riesterer.

PALMERSTON NORTH: There is a good flow of honey throughout the district, and bees are gathering freely. There have been slight showers, but more rain is needed. Pastures in places are burning. A good quality of Clover honey is being gathered. Crops will not be much more than above the average. Indications are for an extended flow, but not a rapid one.—H. F. Dodson.

GREYMOUTH: The conditions on the West Coast during the month of December have been exceptionally good. The Kamahi is flowering profusely and there is a good flowering of Rata in the coastal areas gradually spreading inland. There is every prospect of a good season. Extracting has commenced in a number of the more forward apiaries.—G. F. Page.

CHRISTCHURCH: December proved wet and unsettled, the rainfall for the month reaching 6 inches in parts of the province, which is approximately 3½ inches above normal. The amount of sunshine recorded was well below the average. Bees remain in good condition and swarming is not yet proving the problem that would be expected following the unsettled conditions. The crop is still uncertain. The clover in most of the commercial areas will hold for the next two months or so, provided the weather is suitable and exceptionally heavy honey flow should follow.—W. J. Fix.

DUNEDIN: The position relative to the prospects of the honey crop in this district has greatly improved. Welcome rains have fallen in most places and with the exception of North Otago, the prospects are for a good honey crop. The prospects for North Otago are that no surplus honey will be harvested unless considerably more rain falls in the immediate future in this district.— D. S. Robinson.

TARANAKI: An average crop is assured and there is a chance of crops well above the average. In some cases, however, the bees have lost their field force and are unable to take full advantage of their good conditions.—H.R.P., 2/1/38.

Foreign Reports

Mr. R. O. B. Manley, in the Scottish Beekeeper reports:

1937.—Generally speaking, the honey season in Great Britain has been a partial failure. The cause was the continual cold or wet weather that persisted almost without a break throughout the two crucial months of June and July. Apart from a few odd days when honey poured into hives, there was no bee weather until July 30th in this district. In the Eastern Counties they had the benefit of a week of good weather in July which helped matters very much there. In some places bees got virtually no surplus at all. Here we got about 40 lbs. Even really magnificent stocks that should have been good for 150 lbs. or more gave very little. Well may 1938 be better for us all. A "good" season was never more needed.

The report in "Gleanings" on U.S.A. conditions states:—

The autumn has been unusually mild. Feeding has been heavier than customary over much of the U.S.A., but winter losses are expected to be greater than usual. The market for honey appears to be firm except on the Pacific Coast. Little section honey now remains unsold. Prices for large lots average 6½ cents (3¼d.) per lb. Beeswax is in good demand at 1/- per lb.

"Buyers are willing to take the light amber honeys for which they seem to have a market—but at a price. One buyer said 'When I can buy at 2d. per lb., I can sell to Germany.' That is the position to-day, so some larger producers have held their honey, feeling that the unrest and uncertainty in world affairs may terminate in conditions that will make a demand for honey."—L. L. Andrews.

Honey Flow Daily Record

Mr. T. Barr, Brydone, Southland, writes on January 2nd: Since I wrote my last note conditions for honey crop have greatly improved; good rains fell in December, but conditions are very dry at time of writing, and more rain would be very welcome. The following are the records of the scale hive which show an increase for the season to date of 145 lbs. Scales are balanced each evening after bees are in for the day; any loss through evaporation, etc., during the night must be made up before anything is registered next day.

Date	Increase	Date	Increase	Date	Increase
Dec. 2	—	Dec. 12	10lbs.	Dec. 22	—
,, 3	—	,, 13	8lbs.	,, 23	10lbs.
,, 4	6lbs.	,, 14	6lbs.	,, 24	—
,, 5	—	,, 15	4lbs.	,, 25	—
,, 6	—	,, 16	—	,, 26	—
,, 7	6lbs.	,, 17	4lbs.	,, 27	—
,, 8	4lbs.	,, 18	15lbs.	,, 28	3lbs.
,, 9	4lbs.	,, 19	14lbs.	,, 29	13lbs.
,, 10	—	,, 20	8lbs.	,, 30	15lbs.
,, 11	—	,, 21	3lbs.	,, 31	3lbs.

From Our Correspondents:

"I have often thought that starving bees eat honey-soaked combs, thus causing dysentery or spring dwindling, as they become distorted with gas. Have any of your readers noticed that naturally-made brood comb seems to have larger cells than those made on the foundation manufactured in New Zealand?"—C.C., Moehau.

"I am very pleased to know that, at last, we are to have a periodical devoted wholly and solely to the beekeeping industry, and I wish it every success."—L.B.S., Paepaerahi.

"Every success for the Journal. A journal reflecting the progress of the industry in New Zealand is very necessary May it grow; at present I think it needs a little Royal Jelly."—A.B., Lower Shotover, Otago.

THE CANTERBURY BEEKEEPER'S INSTRUCTIONAL AND SOCIAL SERVICE—HORNBY

A field day will be held by the above Service at the Queen-rearing apiary of Mr. H. Busch, Main South Road, Hornby, on Saturday, the 22nd of January, at 2 p.m.

All beekeepers are cordially invited to attend, and they will have the opportunity of seeing the Caucasian race of bees, with which Mr. Busch's apiaries are stocked. A demonstration on queen rearing will be given. Exhibits will be staged by several dealers in beekeepers' supplies.

Appliances new to New Zealand beekeepers will also be on show, which includes the Adam feeder, which fits like a super, a package bee cage, an overseas export cage, etc., as well as samples of Hawaiian, American and English honeys.

Afternoon tea will be provided, and ladies are requested to bring a basket.

H. R. BUSCH,
Secretary.

LITERARY NOTICE

LITERARY CONTRIBUTIONS for the N.Z. HONEYBEE must be posted to arrive at the address below by the 7th of each month, and copy of ADVERTISEMENTS to arrive by the 10th of each month.

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