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REPORT ON THE FRUIT INDUSTRY OF CALIFORNIA.

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Hon. T. Y. Duncan, Minister for Agriculture.

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THE

FRUIT INDUSTRY OF CALIFORNIA:

NOTES ON ITS POSITION AND PROGRESS.

NOTE.

As Mr. William Johns, President of the Auckland Fruit-growers' Union, had made arrangements to visit California, he was authorised by the Government of New Zealand to study the system of fruit-production, methods of packing, utilisation, modes of transit, &c.

Attached is a communication received from him, which is published for the benefit of fruit-growers.

Though many in New Zealand are well acquainted with California and its resources, the majority of our fruit-growers know little about the country, and therefore I have thought it might prove interesting to them to learn something of the fruit industry in a State that now claims the proud position of being the premier fruit-producer of the world; hence this brief review of the position and progress, climate and soil, mode of culture pursued, method of packing, transit of fruit to market or cannery, and general relative position of Californian orchards and orchardists—as compared with our own—may prove alike interesting and instructive.

To say that California has 410,000 acres in orchard—as compared with our own 30,000—gives but a very imperfect conception of the magnitude of her fruit industry; but when we learn that 60,000 car-loads of fruit, each containing 10 tons, were "shipped East" last season, and that 200,000 tons of canned fruit were put up by the canneries of the State, we have a better appreciation of the gigantic proportions to which her fruit industry has attained. When to this is added the many thousands of tons of fruit dried, in the shape of prunes, raisins, figs, &c., the very large amount of wine manufactured, besides the vast quantity of fruit consumed by the million and three-quarters of her own population, we can then realise the enormous extent and productiveness of Californian orchards.

Climate and Soil.

It is scarcely necessary to state that such a gigantic industry has been developed in a soil and climate and under conditions extremely well suited to its growth and progress. The climate of California for all practical fruit-growing purposes may be divided into two seasons, each of six months' duration—one of moderately wet weather and of cool temperature, the other of sunshine and summer heat. Of course, there is no abrupt change, one season gradually merging into the other; and, while along the coastal plains moisture and moderate coolness prevail for a slightly longer period than does summer heat, and in the great interior plains of San Joaquin and Sacramento the contrary conditions exist, yet for the whole State the definition given above is fairly applicable. This feature of a six-month's hot summer, during which rain scarcely ever has been known to fall, is in marked contrast to our New Zealand climate, and renders irrigation on a very large scale a vital necessity for the growth and proper ripening of every description of fruit.

The soil, generally speaking, is a deep friable loam, though differing widely in character in different portions of the State. In the foothills of the Sierras decomposed granite and sandstone mixed with quartzose abound, and this soil is of unsurpassed fertility; the plains on the other hand are composed largely of alluvial deposits.

Fruit-culture.

Fruit-growing in California, as with us at present in New Zealand, had many attendant difficulties to overcome in its earlier stages of development. The multitude of varieties cultivated—many of them worthless and unsuitable; the prevalence of insect pests, one of which, *Icerya purchasi*, or cottony cushion-scale, at one time threatened the extinction of the orange-groves; the lack of sufficient moisture in many otherwise suitable districts—all these and other difficulties were experienced, and in time overcome. Wholesome and dear-bought experience soon taught what varieties should be cultivated in suitable localities. The introduction of the beetle *Vedalia cardinalis* from New Zealand and Australia soon cleared the orange-groves of the cottony scale, while the opening-up of the transcontinental lines of railway and the establishment of canneries furnished inexhaustible outlets for their products. Orchards on a large and comprehensive scale began to be planted with only a few well-proven and desirable varieties of fruit, and at the same time irrigation-works on so vast a scale that whole districts could be watered were planned and executed.

All the orchards are laid out on the square principle, the distances between the rows and between trees in each row varying

according to the soil, situation, and sort of fruit cultivated; from 18 ft. to 24 ft. being the usual distances.

The ground is kept scrupulously clean, the hot, dry summers favouring the easy suppression of weeds. The trees are all branched low and trained mostly on the open-vase principle, their height, except in the case of cherries, seldom exceeding 15 ft.—the latter sometimes 18 ft. to 20 ft. Pruning is closely attended to, and the thinning of the fruit, especially for canning purposes, very carefully done.

Irrigation is now generally practised, the cost to the grower being from 2s. up to 8s. per acre for every inch of water used. From 6 in. to 8 in. of water is generally deemed sufficient for the season. This does not, of course, include the cost of conveying the water through the orchard, which has to be borne in every instance by the orchardist.

Speaking generally, the average size of a Californian orchard, or "ranch," is about 25 acres—many are much less; while ranches of 1,000 acres are occasionally met with, though subdivisions into smaller areas is proceeding rapidly.

Very little manuring is done, though in many old-established orchards the effect of the constant withdrawal of heavy crops is clearly apparent, and some orchardists are wisely applying fertilisers, with most satisfactory results.

Insect and Fungoid Pests.

These pests are troublesome in some quarters. The San José scale is widespread. The peach-moth, similar to though not so destructive a pest as the Australian fruit-flies, is prevalent in the orchards on the foothills of the Sierras. There are various kinds of troublesome leaf-rollers, while the codlin-moth is much in evidence in the apple-growing districts. The peach-curl, so common with us, is also prevalent in early spring, but, as with us, a liberal application of bordeaux or other suitable spraying mixture almost completely subdues it. Every orchard I visited was regularly treated, the result being healthy trees and good crops. Similarly, other orchard pests are vigorously combated, usually with success, the codlin-moth giving the most trouble, it being of all pests the hardest to suppress.

Fruit-picking.

Picking is performed with great care—no rough handling being permitted, as each fruit is hand-picked—peaches being at once wrapped in tissue paper and placed in the boxes by an assistant who remains below the trees; all other kinds of fruit are also packed at once in their respective boxes or baskets.

Fruit-boxes.

Fruit-boxes differ materially in size and pattern from those usually used by us. Each box is furnished with two battens of ½ in. in thickness. These, when the box is filled and the lids put on, are nailed on both ends of the box, on top of the lid, thus preventing any box placed above from resting on the lid of the one beneath, and thus allowing ventilation between each box. The side pieces and lids of each box are also perforated with holes, whereby thorough ventilation is secured.

The following are the dimensions and capacity of those "shipped East": Peach-box, 19 in. by 13 in. by 4½ in. inside measurement; capacity, about 20 lb. Plums or apricots, 18 in. by 16 in. by 4½ in. inside measurement; capacity, about 22 lb. to 24 lb. These latter are furnished with four chip baskets, each holding about 6 lb. Cherries and other small fruits, 17 in. by 9 in. by 2½ in.; capacity, about 10 lb. to 12 lb. Pear and apple boxes of various patterns and sizes are used, but principally of about 40 lb. to 50 lb. capacity, and all furnished with battens and perforated sides and tops.

Packing in Rail-cars for Transit.

This most important operation is performed by the shippers, and, as in New Zealand, there is great room for improvement in this respect. I was careful to note the whole operation, which, in order to carry tender fruit on a ten-days journey for several thousand miles in perfect good order, must necessarily involve the greatest skill and care.

The American Refrigerator and Ventilator Fruit-car usually measures about 39 ft. by 9 ft. by 7 ft. 6 in. internal measurement, and is of from 10 to 14 tons capacity. At either end is a compartment for holding ice, the sides and roof being double to admit of perfect ventilation.

The packing of the fruit is carried on at both ends of the car, a space of some 3 ft. or 4 ft. being left vacant in the middle of the car, between the doors. When the packing is completed, two strong hurdle-like frames, reaching exactly across the car, are placed one at each end of the fruit-stacks, and are securely shored up by pieces of timber, so that each stack of fruit is immovable while in transit.

The fruit itself is packed on battens, so that every tier of boxes is kept apart from the others. Battens are also so arranged that there is an air-space between the floor, sides, and top of the car; the battens being all nailed to the boxes, so that no box or series of boxes can move out of position.

The ends of the car are kept constantly charged with ice during the whole journey—about 3 to 5 tons of ice being used

in each car—and the temperature is always kept so low that the fruit almost invariably arrives in good order.

The freight rates from California to the eastern seaboard are about $380 (£76) per car—this charge including the ice supplied during the journey—or approximately from ¾d. to 1d. per pound on 10 tons of fruit.

Canning Fruit.

As a rule, fruit for the cannery is packed in boxes of from 40 lb. to 50 lb. capacity. These boxes are also furnished with end battens and perforated sides, but the fruit, though carefully packed, has no wrapping of paper round it (except in some rare instances). All fruit for cannery purposes has to be free from all bruises and other flaws; it must be of good if not choice quality, and requires be be delivered at a certain stage of ripeness. Boxes sent to canneries are marked with the owners' names and returned, so that one outfit of boxes may serve for several seasons.

Dried Fruits.

The season being too early during my visit, I did not see any of the great drying-grounds in actual operation, but the immense amount of prunes and raisins dried annually here attests the magnitude of this industry and the success attained in this direction.

It is clear to me from the foregoing, that we in New Zealand have much to learn and many mistakes to rectify before fruit-growing becomes a really profitable and permanent industry with us.

Chief of all our mistakes, I think, is the loading-up of our orchards with every imaginable sort and variety of fruit, so that instead of being, as they ought to be, "commercial orchards," they are simply a vast collection of experimental grounds, wherein a series of aimless and too often profitless experiments are carried out without benefit to ourselves or others. Most certainly after careful study of Californian practices and methods I feel convinced that two-thirds of the varieties of fruit that now cumber our orchards could be profitably eliminated, and such ground better occupied with an increased amount of the well-tried and suitable varieties that have proved to be successful and profitable. Upon these could be profitably bestowed all that care and attention which the Californian grower finds so necessary.

Our system of packing fruit for market is also faulty and defective. How few of us dream of carefully grading our fruit and as carefully wrapping each fruit in soft tissue paper, so that it may be perfect in appearance and well preserved in quality for the consumer's use!

There is a great need, also, for improvement in the manner in which our fruit is at present carried to market by rail. We cannot, of course, expect at this stage to have refrigerator cars, but certainly "ventilator cars"—furnishing abundance of air—should be provided instead of the close, stuffy "K" wagons that at present are generally used. Such ventilator cars, when not used in carrying fruit, would be equally well adapted for carrying general goods.

Our steamboat companies should also consider the needs of fruit-growers in providing the coolest and best possible storage for fruit while in their charge. The industry is a young and growing one, and is well worth catering and caring for.

Finally, I should like to say a word or two by way of comparing the position of the Californian fruit-grower with our own. Though the Californian grower has at his hand every possible facility for the sale and disposal of his fruit, and though in climatic and other conditions for its full ripening and development he possesses some advantages over us, yet his chief market lies some thousands of miles away from him, which, with the first cost of his orchard added to the expense of constant irrigation, absorb fully two-thirds of the value of his fruit. The price realised by him for every pound of peaches, pears, plums, or apricots he sells scarcely averages 1d. per pound. Even his cherries only average about 2d. per pound. From this has to be deducted brokers' charges, local freights, cost of irrigation, of boxes, and the whole cost of cultivating, picking, and packing his fruit. Several typical "ranchers," owners of 20 or 30 acres of orchard, informed me that they rarely net over $1,000 (£200) per annum, from which has to be taken the whole upkeep of the rancher and his family; and, as the cost of living is quite as high here as in New Zealand, it is easily seen that he does not realise a fortune. Contrast this with the outlook of the New Zealand grower, whose chief market for many a year to come will be at his own door, and even when he has to seek foreign markets for his surplus of canned goods these will be quite as accessible to him as to the Californians. When, added to all this, the climate of New Zealand to live in, as compared with that of California, is simply Elysian (I am writing now with the thermometer at 102°), you will probably conclude, as I do, that, *with industry and skill* to assist him, the New Zealand fruit-grower's lines would be indeed "cast in pleasant places."

Los Angeles, California, 1st July, 1904.

San José, California, 18th June, 1904.

Sir,— Re *Fruit-canning Expert.*

In accordance with arrangements made with the Government ere leaving New Zealand in May last, I have the honour to report that on my arrival here I forthwith began making careful inquiries *re* above. So far, I have not met with much success, for the large cannery associations naturally looking askance at any attempt to deprive them of even one of their best men, of whom there are but few altogether, since the system in vogue here is not conducive to the production of good all-round men such as we seek, as, with the exception of one managing head in each cannery, the other chief assistants are generally comprised of skilled specialists, each complete master of his own department, with but little general knowledge beyond this. However, I am yet hopeful of finding a suitable man, having now more than one in view, and the result of my inquiries I will communicate to you later on.

Meanwhile I have devoted some time to inquiry as to the classes of fruit generally used here for canning purposes, and, what I think is equally to the purpose, what sorts of fruit to avoid if we would wish to build up in New Zealand a canning industry capable of competing successfully against all outside products. The result has been to convince me that one class of fruits lately introduced extensively into New Zealand orchards would be almost certain to prove a failure not only as a canning fruit, but also as one to grow for ordinary commercial purposes. I refer to the Japanese plums. These were planted pretty extensively in California many years ago, but, proving unfit for either canning or dessert purposes, were so utterly discarded that during a drive of some thirty miles through the orchards of Santa Clara County yesterday I saw only four Japanese plum-trees. There is not a can of these plums put up in the whole State, and except in the northern portions, from whence a few carloads are yet shipped East, they are practically non-existent in the State. Such being the case here, I would venture to suggest, sir, that your Department would materially benefit growers by drawing their attention to this matter, so that timely steps may be taken to rectify a mistake that Californian growers, in common with our own, appear to have fallen into.

With reference to varieties of fruits chiefly used in canning here, I intend to procure reliable information from the canning authorities, and forward it on to you by next mail. Meanwhile it may be safely assumed that for canning purposes peaches only of firm texture, chiefly of the yellow-fleshed varieties, and *free from all redness at the stone, which discolours the syrup,* are used for canning purposes,

chief among the varieties used here being Phillips Cling, Early and Late Crawfords, Wheatland, Foster, Elberta, Levi, Orange Cling, Muir, McKevitts, and Salway. Many of these succeed well with us, though Phillips Cling, which is looked upon as the finest canning-peach here, is, as far as I am aware, unknown in New Zealand.

Plums chiefly used are Egg Plum (Magnum Bonum), Coes Late Red Golden Drop (much inferior to ours), Washington, Jefferson, and several other varieties of greengage.

Apricots are canned in immense quantities, the principal varieties being Moorpark, Blenheim, Imperial, and Hemskirk.

Pears in large quantities are canned, the Bartlett or Bon Chrétien being almost the only variety used.

Large quantities of cherries are also canned, Royal Anne, identical with our Bigarreau Napoleon, being the leading sort in demand.

Apples are also canned in quantities, almost every good sort being used, besides an immense quantity of the smaller fruits; also asparagus, rhubarb, and tomatoes in vast quantities.

Finally, that our growers may understand the vast dimensions to which the canning industry of California has attained, I may mention that one cannery alone, the San José (one of the California Canners Association's plants), turned out last season 28,000 tons of canned goods, employing during the season over fifteen hundred people daily.

I have, &c.,

WM. JOHNS,

President, Auckland Fruit-growers' Union.

The Hon. the Minister for Agriculture,
Wellington, New Zealand.

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