

which has been developing ever since. Today there are orchards, ranging from 50 to 200 or more acres in extent, in most every section of the state, except the northeast.

Even a brief survey of apple culture in the state would be incomplete without some reference to the agencies that have been active in the developing of fruit growing. The Vermont Horticultural Society was organized at the University's Agricultural building in 1896. The headquarters for the society have always been at the University. This society has grown, slowly but gradually, until it now has a membership of approximately 500. The association has published 20 annual reports, setting forth the proceedings, including exhibitions, addresses and activities at the summer meetings. These have been very valuable, and constitute a text book on Vermont Apple Growing. Nearly every important fruit grower in the state is a member of the society; and there are a great many amateurs also enrolled in its membership list.

The University of Vermont has always been helpful in furthering the apple industry, and has helped the society to serve many of its purposes. The Vermont Experiment Station has published several articles on different phases of fruit growing, and has an orchard for experimental purposes from which data is compiled and published—data dealing with the growth of trees and the yields there from. The Vermont Agricultural Extension Service through its extension workers, chiefly the County Agents, spreads a great deal of information to stimulate interest in various problems such as demonstrations in spraying, pruning, orchard management, etc. Perhaps one of the most important and yet practical phases of helpfulness has been the preparation and publication, and revision from year to year, of the standard spray program for fruit growers, which is being used quite extensively throughout the state. A big problem in fruit growing anywhere, is the control of insect pests and fungus diseases; and nothing contains so much information regarding these points, as the spray program.

A recent survey of orchards shows that during the last 15 years, there has been probably many more than 285,000 trees set out, embracing an area of nearly 4,000 acres. These plantings have been largely on the western border of the state, extending almost from the Canadian line to New York and Massachusetts; but they have not been restricted to the Western border, for there are many good sized orchards in Washington, La-

moille, Orange, Windsor and Windham Counties, as the accompanying table will show.

A great many of these orchards are on slightly elevated land, as they should be for ideal orchard purposes. Some are on fairly steep hillsides, but with adjustments and improvements of culture, this does not prove to be a barrier rather, in some cases, it is an advantage. Slightly elevated or rolling land is much better for orchard purposes as it gives better drainage of the soil, and greater circulation of air, thus giving freedom from forests.

It is a most interesting study to observe orchard work in commercial areas. Much of it is done with modern machinery, utilizing motor trucks and tractors. The land is often plowed with tractors and the spraying and dusting machines are propelled by tractor power, while the apples are graded by a sizing machine. Some of these have a capacity of 600 barrels per day. Nearly all of the commercial fruit goes out of the state, to boat or to train, in motor trucks.

Vermonters are getting good prices for their fruit. To be sure prices vary in different seasons in accordance with the quality and general supply, and market demands. In recent years McIntosh of first quality brought prices ranging from eight to thirteen dollars per barrel; Delicious from eight to twelve dollars; and Greenings and Spitzenburgs ranged from five to ten dollars. A serious and sustained effort is now being made to eliminate cull apples and to do away with second grades, through refined methods of culture; more exact practices in spraying; and precise, conscientious methods of grading—this is the secret of good prices and satisfactory returns.

LARGE ORCHARDS IN VERMONT 1926
All But a Few Set Within 15 Years

ADDISON			
Town	Name	No. of trees	Acres
Addison	Wm. Noonan	1,500	60
Bridport	Leo Heminway	3,000	120
Bristol	A. C. Dyke	1,000	5
Castleton	Hoyt Orchards	1,500	60
Cornwall	J. E. Sperry	1,000	40
Cornwall	J. E. Sperry	500	5
Ferrisburg	Bertha Oppenheim	1,200	60
Middlebury	Paul Dow	1,000	40
Middlebury	Paul Dow	2,000	10
Middlebury	C. L. Witherell	4,500	45
N. Ferrisburg	G. E. Badlam	1,000	25
Orwell	C. C. Allen	500	5
Orwell	W. Gianini	1,000	10
Orwell	L. B. Hall	1,000	10
Orwell	R. S. Hall	500	5
Orwell	W. A. Jennings	1,000	5
Orwell	J. M. Stevens	2,000	80
Orwell	E. W. Wilcox	400	4
Orwell	J. C. Thomas	500	5
Shoreham	W. J. Anderson	2,000	10

Town	Name	No. of trees	Acres	Town	Name	No. of Trees	Acres
Shoreham	W. J. Anderson	1,860	24	Topsham	C. D. McDonald	1,000	10
Shoreham	G. A. Stalker	4,000	100	Tunbridge	Ordway and Beede	1,000	5
Vergennes	H. C. House	1,000	10				
Vergennes	E. N. Loomis	8,000	100		ORLEANS		
Weybridge	Elmer Wright	1,000	40	Orleans	H. C. Bartlett	1,000	5
					RUTLAND		
Bennington	S. E. Harwood	2,000	10	Brandon	A. M. Goodwin	300	9
Bennington	The Orchards	65,000	650	Brandon	C. A. Paine	2,000	10
Dorset	Dorset Orchards	15,000	170	Brandon	State School	260	7
Dorset	E. H. West	11,000	40	Castleton	E. J. Armstrong	500	5
S. Shaftsbury	E. B. Barraus	500	5	Castleton	J. R. Churchill	1,000	5
				Castleton	E. A. Ellis	1,000	10
				Castleton	J. R. Hoyt	1,000	5
				Castleton	MacRae Orchards	13,000	200
Burlington	E. F. Boyce	1,200	20	Fair Haven	C. E. Griffin	500	5
Burlington	C. W. Hurlbut	2,000	10	Fair Haven	H. Hamilton	1,000	5
Burlington	Vt. Fruit Co.	4,000	20	Fair Haven	H. R. Hamilton	500	5
Charlotte	M. C. Hill	500	15	Middletown Springs	Buxton Orchards	18,000	180
Charlotte	C. T. Holmes	2,000	20	N. Clarendon	George Stewart	2,000	10
Essex Center	R. Mayo	500	5	Rutland	C. C. Rice	2,000	80
Shelburne	Ordway and Winters	1,000	25	S. Shaftsbury	Carrol Frost	500	5
Shelburne	Shelburne Farms	1,000	55	S. Wallingford	George Stafford	2,500	60
South Burlington	Charles Merrill	1,000	10				
					WASHINGTON		
				East Highgate	Edmund Seymour	6,000	50
				Enosburg Falls	L. L. Marsh	1,000	10
					WINDHAM		
				Grand Isle	Grand Isle Orchard Co.	10,000	215
				Isle La Motte	Allen Hall	450	4½
				Isle La Motte	A. H. Hill	3,500	40
				South Hero	R. R. Allen	1,000	5
				South Hero	Elmer Hill	4,000	40
				South Hero	T. L. Kinney	1,000	5
				South Hero	T. B. Landon	1,000	10
					LAMOILLE		
				Cambridge	L. Putnam	4,000	40
				Morrisville	F. M. Small	500	5
				Morrisville	C. F. Smith	500	5
				Waterville	F. H. McFarland	11,600	20
					ORANGE		
				Chelsea	John Davis	1,000	10
				East Corinth	Julian Dimock	1,600	35
				Newbury	I. M. Brock	1,000	5
				N. Thetford	H. Colton	1,000	5
				Randolph	E. H. Mason	640	16
				Randolph Ctr.	C. I. Boyden	500	5
				Ludlow	E. C. Ford	400	5
				Quechee	Quechee Fels Farm	250	10
				Saxtons River	F. L. Osgood	2,000	80
				S. Royalton	A. J. Eaton	3,000	25
				Springfield	A. W. Aldrich	500	5
				Springfield	G. A. Wellwood	1,000	10

Vermont's Maple Sugar Industry

By JOHN P. DAVIS

President, Vermont Maple Sugar Makers' Association.

I. NO ONE knows just when it was discovered that sap from the rock maple could be made into delicious syrup and sugar by evaporation. There are several legends concerning this discovery and a pleasing one is related by Mr. Rowland C. Robinson who writes very entertainingly of early life in the Green Mountain state. This legend relates that one day while the mighty

hunter, Woksis, was out in search of game, his squaw, Moqua, became deeply interested in embroidering some moccasins and forgot that she was boiling moose meat in the sweet water of a maple tree. So the water boiled away until it made a thick, brown syrup. When Woksis tasted his supper, he decided that he had never eaten anything so good and he devoured every scrap of it greedily and then must go about tell-

ing the others in his tribe that Kose-Kus-beh, a wise one from heaven, had taught Moqua how to make a wonderful new food by boiling maple juice. Soon the discovery became known among all the other tribes.

There are few of us so prosaic that we do not feel the charm of working in the sugar woods, for the making of sugar has more glamour about it than other farm activity. There is something mysterious and fascinating about tapping a maple when the first warm days come and the ice is breaking up in the streams; for the sap comes rushing in swift drops when the spout is driven in and as these drops strike the bottoms of the buckets, each bucket sends back a different tone and rhythm until presently you feel that you are listening to a symphony of the awakening spring. I do not know whether the Indians had any ceremonies connected with the sugaring time, but if they did not, they missed a great opportunity.

The white man, following in the footsteps of the Indians and using their primitive methods and then more and more modern ones, has always made "sugaring" a gala time. This is one season of the year when all of the family from the youngest to the oldest manage to be on hand to help so that when the sap is boiled down to the proper density, each can have that typical Vermont confection "Sugar on snow."

In the pioneer days of Vermont and up to comparatively recent times, maple sugar has been made for family consumption rather than as a source of income. In the olden days, it had not much cash value; in fact, it was used as a substitute for cane sugar which was higher in price.

In those days the method used was to bore a hole in the tree with an augur whose diameter was sometimes as large as one-and-one-quarter inches. Into this hole a hollow spile was driven and the sap was caught in wooden pails which were set on the ground or hung on a nail driven into the tree. The sap was gathered in wooden pails and carried to the place of boiling by means of a sap-yoke. This was a piece of wood about three feet long which was shaped to fit over the shoulders. Ropes with iron hooks attached hung from each end so that when pails of sap were swung on the hooks, the greater part of the strain was carried by the shoulders instead of the arms of the person gathering the sap. The pails were emptied into large iron kettles, suspended from a stick which lay across two forked sticks that had been driven into the ground. Fires were kept under these kettles and when the sap had been

evaporated to a certain point, the liquid was ladled into another kettle and the process continued until there was a sufficient quantity in the last kettle to boil down to sugar. In the days when maple sugar was used largely at home, much of it was stored in the form of stirred sugar and looked much like the brown cane sugar of to-day except that it was much darker and undoubtedly had more impurities.

As the industry grew and the process of making maple sugar was studied, methods changed until to-day we have excellent equipment that not only does away with much of the hard work, but also saves time so that a farmer can handle a large sugar-place without seriously interfering with his other labor.

To-day two methods of gathering sap are in use. In the older method, a hole seven-eighths inch in diameter is bored into the tree, piercing the cambium, or inner layer of bark, and into this a metal spout is driven to which is attached a hook. A tin or galvanized bucket with a capacity of twelve to fourteen quarts is swung from the hook and a cover attached either to the bucket or to the spout so that rain, leaves or other foreign matter cannot impair the quality of the sap. Roads are broken thru the sugar place and on these a covered gathering tank with four to seven barrel capacity is drawn on a sled or dray. Men gather the sap from each bucket in a large pail which is emptied into the gathering tank. When a load has been secured, the gathering tank is hauled back to the sugar house and emptied into large storage tanks. It has been found that the sooner the sap can be boiled into syrup after it comes from the tree, the finer the quality of syrup will be and so there is now a tendency to increase the capacity of the evaporator in order to avoid storing sap for any considerable time.

The other method of gathering is by a piping system. Under this system, wires are strung either to the storage tanks at the sugar-house or to tanks conveniently located in the sugar-place and on these wires are hung tin pipes which fit together and which have openings thru which branch pipes may enter. In this way sap flows thru connecting pipes directly from the tree to the storage-tanks. Some sugar places can be wholly worked by piping,—others, in part, but to be used to advantage there should be a fairly good grade and the trees tapped should stand not more than fifteen feet apart.

Great improvement has been made in the handling of sap at the sugar-house. The modern sugar-house is well-built and has good venti-

lation to allow the steam from the evaporator to escape quickly. The modern evaporator has a heater which raises the sap to the boiling point and after entering at one end of the evaporator by force of gravity from the storage tank, the sap is pushed along thru a system of large pans and siphoned over double partitions until in the final compartment it is brought down to a standard syrup, weighing eleven pounds to the gallon.

An evaporator of medium size should deliver about thirty gallons of syrup a day and the larger ones give out sixty or more. For best results as soon as the syrup is drawn from the evaporator, it should be run thru felt strainers or filters to remove nitre or other foreign substances that may be in suspension.

II.

Equally important with the problems of manufacture are those of marketing. In fact, it may be said that while the former have been satisfactorily solved, the latter are increasingly in need of united action. Until five years ago, the maple products in this state were marketed largely in the form of sugar. Considerable syrup in one gallon cans was sold by the producers either directly to the consumer or to dealer in the cities, but the bulk of the product went as hard sugar in tubs holding about thirty pounds. This sugar was not purchased at a price based upon any standard as regards color or quality; it all brought the same price.

But five years ago the Vermont Maple Products Co-operative Exchange Inc. was formed and they and other dealers encouraged the farmers to make syrup, rather than sugar, and the syrup was purchased according to four different color grades, based upon the United States color standards, called fancy, number one, number two and number three. As there is a difference in the purchase prices paid for the highest and the lowest grades amounting approximately to fifty cents per gallon, the farmer is thus encouraged to make the best grade possible. The syrup is delivered in steel drums holding about sixty gallons and the grades are kept separate until reaching the warehouse where they are blended to make the color grades used in selling to the consumer. In this way a consumer buying a certain brand will always get

the same standard quality which is the only satisfactory deal for either consumer or producer.

At the time that the Maple Products Co-operative Exchange was organized, maple syrup was selling for about eighty cents per gallon at the farm; to-day the prices range from one-twenty per gallon to one sixty-five per gallon, depending upon the grade. We cannot say just how much influence the co-operative has had in this advance, but it is generally conceded that it was considerable. And I do not make the flat statement that the Exchange can pay more to its members than can be paid by the American Maple Corporation, which has been recently organized and is composed of three of the largest buyers of maple syrup in the state. I do believe, however, that a co-operative, properly financed and managed and with a volume of business sufficient to balance their fixed charges, should be able to make a price for syrup that would indicate its true value. To date, the sugar-producers of Vermont have not indicated by their action that they are interested in the co-operative marketing of maple syrup and at present the only solution seems to be for a group of men who are interested in the continuation of the Exchange to take over the business and buy syrup from the producers on the same basis as the other dealers. If this can be done and it is shown that the Exchange can break even, then possibly the producers in the state will be willing to invest their own money in the business.

The marketing problem is a serious one at present and is of interest not only to the producer, the dealer and the consumer, but it *should* arouse the interest of all ardent sons of Vermont for if a satisfactory price to the producer is not maintained, he will either make a limited amount of maple products or more likely, will *cease making any* and will sell his sugar trees for lumber. Already this is being done to an alarming extent and if the cutting continues, there will come a time when the dealer will have no business for lack of maple products. In Ohio, many sugar places have been ruined and the industry is rapidly shrinking in importance.

Before deciding to sell his sugar-place for lumber, each producer should squarely face the facts and work out in cold figures—or consult someone who can make these comparisons fairly—just what he is gaining, *if anything*, by selling one of his best sources of income.