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-: THE PEPPERMINT INDUSTRY :-

A T H E S I S

by

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THESIS

The peppermint industry is one concerning which little is known outside of the somewhat limited regions in which it is grown. In this country it was first cultivated in Massachusetts; later, it was quite extensively grown in Wayne County, New York. From there it was taken to Ohio and southern Michigan, and for many years St Joseph County, Michigan, produced the greater part of the peppermint oil of the world. From there it has been taken to a number of other localities in this and neighboring states.

Until quite recent years the methods of growing and distilling, together with lack of knowledge of the crop, limited the supply so much that large profits were secured by those who produced the oil, as well as by those who speculated in it. This has been slowly changing as the cultivation has extended until at present the price corresponds more nearly with the cost of production.

The plant belongs to the family Labiatae, a quite extensive one containing a number of very common plants and weeds. It is a square stemmed herb living from year to year by means of its roots and underground stems. The leaves are placed opposite; the flowers are in small clusters placed

rather loosely upon a spike. The parts are arranged in series of four, whitish to purple in color.

The plants grow best in a rich moist soil, containing large amounts of vegetable matter. A number of species of the mint family are cultivated for the oil which they produce. Among them are the horse\_mint; *Mentha sylvestris*; spearmint, *Mentha viridis*; but by far the most important one is the peppermint, *Mentha peperita*. When well cultivated, it gives a very branching stem from three to five feet in length, abundantly supplied with leaves. When not cultivated, it grows up in a long straight stem with fewer leaves. The leaf is the part which contains most of the oil, which is held in little glands or sacs, very few of which are found upon the stems. The most favorable ground for the growth of the crop has been found to be swamp land which abounds in many parts of the State. Much of this land had for many years been considered worthless for anything excepting pasture. What is known as the "Big Marsh" of Florence township in St Joseph County was probably the first one ever used for this purpose to any extent. The muck upon this marsh varies from one to ten or twelve feet in depth, overlying a subsoil of sandy or clayey hardpan, or quicksand. It was too wet for cultivation, being impassible to horses, and in some parts

scarcely safe for a man on foot, nothing but grass and willows growing upon it. This land has been drained and is now the best peppermint land in that section. Occasional large open ditches have been cut through it into which the smaller tile drains empty. These small drains are placed from eight to twelve rods apart, and consist mainly of four inch tile.

The crop is one which requires abundant moisture, consequently this ground is well fitted for the purpose. If it is grown upon upland, low level ground is the best. The preparation of soil for a mint crop must be very careful and thorough. Above all, the ground must be free from weeds, otherwise the quality of the crop is much damaged and the expense of producing is much increased. The ground must be well worked and well prepared before the time for planting the mint crop arrives. The preceding crops should be well tended so that the ground may be free from weed seed.

The plowing should be done in the fall if possible, so that the soil may have a chance to become somewhat settled. The ground is plowed from seven to ten inches deep, all the clods are then thoroughly cut to pieces by a disc harrow.

The crop is started from roots taken from fields which have already produced one crop. The roots or underground stems are plowed up, shaken free from soil, taken to the

field in which they are to be planted, piled up, and covered with earth until used. Care must be taken to keep the roots from being dried by contact with the wind or sun, since a little carelessness in this matter may ruin the crop. An acre of good mint will furnish roots enough to plant from eight to ten acres of the new crop.

The time of planting is during the early part of April, or as early in the spring as the ground can be worked. The ground is marked by furrows from four to six inches deep and from three to three and one half feet apart. The mode of planting is peculiar; the roots are carried in a sack under the arm of the planter, suspended by a band over the shoulder. The roots are separated and placed in the furrow, as nearly as may be with two parallel strands of roots. The planter walks astride the furrow and kicks the earth in on each side with his feet, leaving it pressed firmly over the roots. The work is very tiresome and a good hand will not plant more than an acre a day. Tedious as is the process of planting, the care of the crop after it comes up is still more so. The young mint is slow in starting and slow in growing, and unless care is taken weeds will damage the crop beyond repair. It is now that the importance of having clean soil is realized, for the weeds must be kept down, not only to allow the mint

to make its best growth, but because most weeds have a flavor of their own which damages the oil unless they are removed before distilling. Deep cultivation cannot be resorted to because of the soil being filled with the roots of the plants, also, owing to the ease with which the plants are covered up. Frequent shallow cultivation with fine-tooth cultivators is resorted to. The crop must also be hoed from two to five times, according to the season and the soil. This is a very tedious job, for it takes a man from two to five days to hoe an acre of the crop.

When the crop has become well started, if the season is a favorable one, it grows very rapidly and soon the ground is entirely hidden. During the first year the stems are confined to the row, though they bend outward and fill the space between the rows. After the first year the whole of the ground is occupied by the crop. After the first year the crop requires very little care, with the exception of removing the weeds which would damage the oil. On upland the crop is usually allowed to stand two years, while upon muck, or marsh land, it is allowed to stand three years before plowing up. On upland the first crop is usually best, while on marsh land the second crop gives the largest yield. The time of harvesting varies somewhat with the season, but it is during the

last part of July and the first part of August. The second and third crops are cut first. In these crops the stems stand erect and they may be cut with mowers, but with the first crop the stems bend so much that it is usually cut with scythes. Great care must be used in curing the crop. It is cut just as it reaches full bloom, or slightly before. It is allowed to lie until it is somewhat wilted, just enough to make the stems limber and flexible. It must not be allowed to become so dry that the leaves break in handling, for a good share of the crop would then be lost. When it is properly cured it must be distilled immediately. It cannot be left in piles for more than a very few hours without heating, which allows the oil to escape, leaving only the blackened stems.

The process of distillation is a very simple one. A small steam plant is necessary, as the process requires a steam pressure of from five to thirty pounds. Large wooden steam-tight tubs or vats are used, about six feet deep, and from six to eight feet in diameter. Into these the mint is tramped tightly and the steam-tight lids closed. The steam is turned on at the bottom, passing through the mint it escapes by a pipe at the top, carrying with it the oil which is quite volatile. This steam is lead through a condenser and the oil and water is caught in a receiver. The oil being the

lighter of the two, rises and is dipped from the top, and placed in large tin cans holding about twenty pounds. The process of distillation lasts from thirty minutes to an hour, depending upon the condition of the mint. The riper and the dryer, the quicker it is distilled. These conditions, however, are not conducive to the production of the largest amount of oil.

Well distilled oil should be perfectly colorless. This depends somewhat upon the freedom from weeds and the condition of the distillery. To make the best oil, the still should not be allowed to get cold during the distilling season, for some parts of it are liable to rust, and a very little rust will discolor a large amount of oil.

The yield of oil per acre varies greatly with the varying conditions. On upland a good crop is from ten to twenty pounds per acre for the first crop, with slightly less for the second crop. Upon marsh land the yield is much greater, from twenty to forty pounds, the second crop giving the largest yield, and the third crop the smallest.

Good judgment is necessary in cutting and caring for the crop, as the time of cutting may make a great difference in the yield. The most favorable time seems to be after a few hot dry days. A heavy rain will diminish the yield. The

oil, being volatile, escapes easily and seems to be washed out by the rain. The cost of distilling is from fifteen to twenty cents per pound. The refuse straw is used mostly as a fertilizer. Stock will eat it in very limited quantities, if it is placed where they can have free access to it, somewhat in the proportion in which we use pepper or salt. It cannot form the basis of a food ration. It makes an excellent fertilizer, excepting that it is a little coarse. Analysis has shown that it is rich in potash, phosphoric acid and nitrogen. This accounts for the fact that the crop is hard upon land. It takes an immense amount of material from the soil, which must be replaced by fertilizing material, or the soil soon becomes exhausted. A first class crop of grain cannot be expected following a mint crop, unless the ground is very heavily manured. Stable manure is the most common fertilizer used. It must be something that is thoroughly decayed or that will decay quickly, otherwise it will interfere seriously with the cultivation of the crop. The common red clover is coming into use somewhat for this purpose. The second crop, on upland especially, is much benefitted by a top-dressing of fine manure.

The mint farmer must take good care of his land, or he is apt to find an exhausted farm upon his hands which will

neither produce mint nor any other crop. The muck soils upon which most of the mint is grown are very fertile, being very rich in phosphoric acid and nitrogen, but even they finally become exhausted.

Several varieties of the plant are cultivated. What is known as the common mint has been most cultivated, but during the past few years a variety known as the English mint has been much cultivated. It is coming into use slowly on account of the scarcity of roots and the expense of procuring them. It gives a much greater yield than the common mint, which on muck land gives from twenty to forty pounds per acre, while the English mint gives from forty to sixty pounds per acre. There are, however, some objections to this variety. It does not seem to give a good second crop, though it has not been tested thoroughly enough to make this a certain objection. Many claim that the oil is not of so good a quality as that of the common mint, and buyers have discriminated against it, but it is not probable that this objection will hold.

The price of oil varies much with the season, though it is largely controlled by speculators. Not many years ago three and even four dollars per pound was a common price, but now the price ranges from one one dollar and twenty-five cents to two dollars per pound. At first thought, it would seem that even this price should give an enormous profit, and

indeed it does when good crops are procured from muck land which has been well fitted, so as not to require too great an expenditure for labor. The crop requires an enormous amount of care as compared with any other farm crop. The wages paid vary from seventy-five cents to one dollar and twenty-five cents per day, and a moderately large crop is required to pay the expenses. Since mint has been grown upon muck land and the price has declined, it has been found unprofitable to grow it on upland, unless it can be grown under the most favorable conditions. The time of enormous profits on the cultivation of the crop is past, but careful cultivation of the crop still yields a better return than most common farm crops.



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