with the result that the cows are dried up through no fault of their own, nor is it through any fault of the machine.

Next to the matter of the operator is the matter of cleanliness, which is doubly important from the standpoint of market milk. We have many times seen can after can of sour milk turned back from a cheese factory when this milk had been drawn by a machine and should have remained sweet. On the other hand, we have asked men who were receiving milk from a large number of patrons whether there was any more sour milk from men with milking machines than from men without, and sometimes they have said yes, but that it was due to carelessness on the part of the patrons. They have proven this in more than one instance by pointing to men who have used a milking machine for years without ever having a can of sour milk turned back. Some dairymen will tell you that it is next to impossible to keep a milking machine clean, and yet only the other day when visiting a successful user of a milking machine we smelled of the tubes and failed to find the faintest trace of anything out of the way. Very little special care was given to this machine, but it was given regularly, which is the important point.

The third point in connection with milking machines is the ability to get repairs promptly. We know of several machines that are not now in use, or were not when last we visited the farm, simply because repairs had been difficult to obtain. This is an important point with all farm machinery, and is so important in fact that many farmers follow the old rule, which says that the best machine is the one made nearest home.

There can be no doubt that milking machines, when properly used, are of great assistance to the dairy farmer. He must, however, take into account the size of his herd, the ease with which he can get labor, the kind of labor he can get, and his financial resources. A milking machine, we believe, should pay with any herd of fifteen good cows, but each owner must decide his own conditions for himself. Getting rid of the hard, steady work is more important to some people than to others, and five hundred dollars is a lot more to some people than to others.

Some February Holstein Records.

The official records of 94 cows and heifers were accepted for entry in the official Holstein Record of Merit during the first half of February. The mature cows numbered 32, and were headed by Princess Echo De Kol 2nd., that made 35.33 lbs. of butter from 708.9 of milk, at the age of six years and nine months. Next comes Korndyke Queen De Kol 6th, a nine-year-old cow, that made 31.64 lbs. butter from 787.9 lbs. milk. Johanna Butterbank 2nd is another 31-lb. cow in this class, and Cornelia Victoria Korndyke, the only other 30-lb. cow. Nine senior four-year-olds show Lady Waldorf Pietje 2nd, to have made 36.09 lbs. of butter from 508.3 lbs. of milk. Five junior four-year-olds are led by Grace Fayne Aaggie, with 25.81 lbs. of butter from 521.8 lbs. of milk. In the senior three-year-old class, Trenton Keyes Hermes has a long lead with 30.09 lbs. of butter from 573 lbs. of milk. The best junior three-year-old record was made by Cornelia Korndyke Pontiac that produced 20.5 lbs. of butter from 369.9 lbs. of milk. A rather wonderful record appears in the senior two-year-old class, where Glen Alex. Queen De Kol 3rd, at the age of two years and eight months, has a record of 32.81 lbs. of butter from 577.7 lbs. of milk. This heifer wins the Canadian championship for both seven and thirty days. Second to her comes Colantha Queen Butter Girl, a heifer that we are informed made 24.20 lbs. of butter under Manitoba conditions, and without succulent feed. The junior two-year-old class is led by May Echo Pontiac 2nd, with 22.45 lbs. of butter from 504.7 lbs. of milk. Only one entry appears in the mature class for records made at least eight months after calving. This comes from Calamity Snow Mechthilde, that in 30 days made 92.25 lbs. of butter, acquiring thereby second place only in Canada to Jemima Johanna of Riverside.

HORTICULTURE.

Vegetable Crops Under Glass.

PART I—LETTUCE.

Of first importance part from the ability of the grower is the type of house best suited to the requirements of the crops being grown. It will be admitted by all that for the production of such crops as lettuce and tomatoes plenty of head room is essential. Not only to prevent rapid changes in temperature but healthier conditions obtain owing to the greater volume of air, and a much higher temperature can be maintained during bright weather for the same reason. Separate houses are best, with top and side ventilation. Connected houses, while economical to build and heat, throw too much shade, especially after a snowstorm. In considering the forcing of most crops it is desirable that the temperature of the soil should be as high as overhead, that is to say, the soil should be given every opportunity to rise or fall in temperature according to the temperature overhead. This being so the question arises as to how this may be brought about.

The raised bench is the best example in this connection, but these are out of the question when operations are on a large scale. My object is raising this question is to point out that even with the sandiest soils, much healthier soil conditions would obtain if better aeration was provided. With soil beds this could be accomplished by means of drain tiles. We know of the benefits derived from underdrainage in field operations. When this is an acknowledged fact from an outdoor standpoint it surely must follow that it is just as necessary indoors. Granting that indoors the soil moisture is under control and as a result is never in a saturated condition, still we must remember that crops are being grown during the cold dull, months with a comparatively low temperature as compared with outdoors during summer, hence the necessity for as warm soil conditions as possible without attempting applied bottom heat, which would be folly with such crops as lettuce, radish and cauliflower, but would be desirable in the case of tomatoes, melons and cucumbers.

The most important greenhouse vegetable is lettuce not on account of the difficulties in growing, but on account of the enormous consumption. The type of lettuce grown locally for the Montreal market is the loose leaf or Grand Rapids, none of the growers attempting to produce the Head or Boston type. My remarks will apply to the former.

Lettuce requires a rich well-drained soil for a quick growth. For preference a heavily manured sandy loam is best: good crops, however, can be grown on a variety of soils. If lettuce is grown exclusively it is possible to take off four crops by catering to an early fall and late spring trade. This is not good practice as the bench space would be idle all summer, it being too late for tomatoes or cucumber planting. Records were kept at Macdonald College to determine the length of time taken to develop marketable heads. The early fall and late spring crops took 72 days, the midwinter crop 128 days. Making allowance for time in seed and pricking off benches it was possible to grow four crops. The usual procedure with the large growers is to sow seeds in rows on a raised bench, prick off to same type of bench 3 inches apart. planting from there to solid beds 6 inches apart.

With leaf lettuce watering is done overhead and with the early fall and late spring crops little care need be taken, but during the dull months water should be carefully applied, wetting the plants as little as possible. This should be done early in the day during bright weather so that plants may dry quickly. Carelessness is this regard may cause mildew or rot, especially if combined with a high temperature.

The night temperature should be 45° to 50° F. depending on weather conditions. During the day this may be considerably increased by sun heat, especially if the houses are lofty. Proper ventilation is an important factor in controlling disease as well as in maintaining a proper temperature. During sunny weather air should be freely admitted providing cold draughts are avoided.

Green aphis is the most troublesome insect pest. These are controlled by tobacco fumigation or by evaporating nicotine. White Fly is troublesome at times if tomatoes are grown on the establishment. These are controlled by hydrocyanic acid gas. Mildew is the most troublesome disease. Plants showing mildew should be carefully removed and the path of soil dusted with fresh slacked lime. Careful watering, heating, and ventilating is the best means of control. Rot is another fungus disease which may be troublesome and is controlled by the same means as mildew.

Head lettuce has been experimented with at Macdonald College, but the loss caused by drip from the glass during mild days following severe weather, proved that for this northern climate it was not a safe proposition excepting possibly as a late spring crop.—Address by A. H. Walker, Macdonald College, Quebec, at the Ontario Vegetable Growers' Convention.

Agriculture in New York State.

DUST OR LIQUID SPRAYING.

In a certain section of New York State there is a boom on in favor of dust spraying. Great things are claimed for this method of applying fungicides and poisons. Bulletins are issued from Cornell University recommending this style of spraying as superior to any others. While at Cornell and seeking to find Professor Wetzell, Plant Pathologist, in order to learn what were the materials used in dusting, I met two young men who were not only ready but eager to tell me what I wanted to know, and a great deal more. They believed in dust spraying, and were ready on any occasion to boost it. One of them was the demonstrator who was sent around to various orchards to show how dusting should be done, and that the people might later in the season see its good effects. He very promptly gave the formula almost universally used—sulphur 90 per cent., arsenate of lead 10 per cent., both very finely ground. As to their claims for dust spraying I was not wholly convinced, having previously heard from better authorities that there were two sides to the story.

While in another part of the State some time before, I called upon Senator T. B. Wilson, a very extensive and successful orchardist, who formerly had given considerable time to lecturing on orchard practice at farmer's institutes. Mr. Wilson told of the experience of a neighbor a few miles away, that was really striking. This man's orchard was separated from his neighbor's on one side by the line fence only. One tree grew right on the line between them. The neighbor had neglected the "pink" spray—the spray that is applied just before the blossoms open. The other sprays were applied carefully at the proper time. Mr. Wilson's neighbor applied the "pink spray" to his orchard and to his half of the tree on the line. Result, he had apples in his orchard and on his half of the tree on the line, while his neighbor had none.

Mr. Wilson has used the dust spray and with good results. He told of a certain section of one of his orchards on which he had once used the dust sprayer throughout the season, and said he had never had finer Jonathans. The great advantage of that method was in the saving of time. He said that one could spray as much after three o'clock in the afternoon as during a whole day with a spray pump. You drive the team right along and just keep waving the blower back and forth as you go, and the dust is just like a thick fog all through and over the row of trees. Of course, it costs about double for materials, but the saving in labor about balances that.

Asked as to authorities on spraying, Mr. Wilson said that Professor Parrott, of the Experiment Station at Geneva was, in his opinion, unexcelled in America. And there is this about him, he will not give out a mere opinion. He makes no public statement unless he is positively sure.

Professor Parrott, when located, proved to be a most charming and unreserved sort of man. He could not, he said, speak for any other locality but his own. Even in his own state there were locaities where conditions were so different from those in Western New York that other means and methods than those most successful in the one district proved best in the other. He was under engagement to lecture on spraying in Pennsylvania soon and he found it needful, especially when far from home, to qualify all his statements as possibly inapplicable in other localities.

Professor Parrott emphasizes the importance of the earlier sprayings. They name the first spray "Delayed Dormant." It is given when the leaves of the blossom buds are out ¼ to ½ inch. This takes the place of the "Dormant Spray" formerly recommended. The second is the "Pink Spray," when the blossoms show pink. The third is the "Calyx" spray, when the last of the petals are falling. Later sprays are determined by weather conditions and control of scab. The two earlier sprays, the first especially, Professor Parrott thinks the most important. He cited the case of a grower who omitted these earlier sprays, and scab came in and the lime-sulphur applications given later burned the foliage so that both leaves and fruit dropped. He believes that this burning of the foliage by late applications of spray mixture results from the presence of scab on the leaves. "Scab and burning are related," he said with strong emphasis.

Asked as to the merits of lime-sulphur vs. Bordeaux mixture, he said that for New York, at least, they would stick to the lime-sulphur. The Bordeaux was the best fungicide of the two, but they were afraid of the russeting of the fruit, which occurs when it is used. In that connection another remark of his is very significant and full of hope. "San Jose scale is not a serious pest now." The lime-sulphur sprayings administered for other purposes suffice to keep it unnoticeable.

On the remark being made that our own Professor Caesar had never declared in favor of dust spraying, Professor Parrott said that he was justified in being conservative on that question. The dust spray is not as effective a fungicide as the liquid sprays, and another weakness was that for coddling moth, being a floating fog which settled gently and was not driven down into the calyx as was the case with liquid spray delivered from proper nozzles, its effect was much less pronounced.

Nevertheless, he said, it was wise for orchardists to have a dust spraying outfit on account of the greater ease and quickness with which the work could be done in case of need. When work was crowding it was often a choice between spraying an orchard in a hurry and not doing it at all.

Afterwards meeting a farmer with a large orchard, the talk turned to spraying. This farmer, by the way, is present master of a local Grange, and therefore may be taken as not one of the no-account stripe. His idea, as to the cause of the ineffectiveness of later sprays when the earlier ones had been omitted, was that to be of any use in preventing scab, spraying should be done when the fungus was just starting. Once firmly established no after treatment would be efficacious. He spoke most favorably of the "spray gun" by which, without a bamboo or other extension rod, liquid spray could be sent in almost as finely divided a fog and to as great a distance as was possible with dust. It required a much stronger engine, however, as a pressure of 250 pounds to the square inch was necessary for good work.

Middlesex Co. T. B.

Reliable Authority.

EDITOR "THE FARMER'S ADVOCATE":

I have been very much interested in the letters by W. T. Macoun on varities of apples which have been running in your valuable journal for the past few weeks. These letters are replete with information on all the worth-while varieties for the prospective planter and may have some effect in increasing the producing of the King of all fruit, the apple, throughout Western Ontario. Mr. Macoun has long been our authority in his line and Professor Ceaser our sure reference as regards sprays and spraying. The Dominion is surely fortunate to possess two such men, so much so that the fruit growing industry owes to them both very much, and if the fruit growers and farmers generally would pay attention there should be a very great improvement all along the line of fruit growing in Western Ontario in the near future. We earnestly trust this will come to pass.

Middlesex Co. E. T. C.