

a great deal more territory in gathering cream than in gathering milk.

Some of our large central plants are grading the cream, and paying for it according to quality. This will have a wholesome effect in educating the patron to properly care for his cream. If you touch a man's pocketbook you will invariably cause him to think. In the West and Central West the hand separators are increasing by the thousands. I was informed by a railroad man that one firm sent out eighty carloads last year. The near future will see a great reduction in the price of hand separators. One large Chicago house is advertising a separator that will skim five hundred pounds per hour, with a guarantee, at about one-third the former price. Many different methods are used for operating hand separators. The calf, the sheep, bull, and the horse, and, in some cases, the dog, has been used on the tread-power, with varying success.

In most cases, the dog has proved too wise for this kind of work, for, usually, at separating time he makes a point of being absent. A few days ago the writer consulted a friend who had used various methods of operating a hand separator, and he maintains that the gasoline engine has given the best satisfaction. He has a gasoline engine of one and one-half horse-power, and eighteen Jersey cows. He has used this engine constantly for four years. He separates the milk and does the churning, and he claims that this has been done at an expense of seventy-five cents per month for gasoline, and the engine is always ready to operate. G. L. McKAY.

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Remarkable Wisconsin Dairyman and Dairy Herd.

To the Editor "Farmer's Advocate":

Sir,—Wisconsin has been for some time known as a leading dairy State. It was my good fortune to visit the farm of Mr. H. D. Griswold, of West Salem, located in the rich La Crosse Valley, about twelve miles from La Crosse City, on the Mississippi. Mr. Griswold was home, and he took some pride in showing us his dairy herd, which consisted largely of Guernsey grades and a few pure-bred Guernseys. He commenced in 1889 to grade up his herd of four grade cows by the use of a pure-bred Guernsey bull. He has since stuck to Guernsey blood, and now has about forty-eight head of old and young ones. He milks twenty-eight cows, and his receipts last year were \$2,300. His cows averaged him \$86.00 per head, by selling his butter-fat for 22½¢ per pound the year round. He kept his herd on a fifty-acre farm in which there is not a foot of waste land. He gets the pasture from the fair grounds in addition, some ten acres. He grows all the corn and oats he feeds, and buys wheat bran. He has two silos, which he fills, and has a lot of corn fodder besides. His ration consists of silage, dry corn fodder, all they will eat, and a little mixed hay for roughage. His grain ration is half bran, by weight, and half oats and corn, mixed in about equal parts. He hopes to have silage enough this year for summer use. He is now growing some alfalfa, which he likes very well. In winter, he waters only once per day, from two galvanized-iron tanks located in one end of the stable. He runs the water into the concrete mangers, and sweeps them out clean after watering. He also has concrete floors, and a manure carrier for cleaning out his stables. His buildings are not at all pretentious. He and his sons have built them with their own labor, and put them up in four divisions. The stables are full, well lighted and ventilated, and he keeps them well white-washed. It is really a pleasure to see how contented and happy looking his stock are. The average producing capacity of his herd in 1889 was 265 lbs. butter; it now is 424 lbs. He has some remarkable producers. Some of his pure-breds are in the Advanced Guernsey Registry.

He was able last year to sell, besides the cream, \$300 worth of pigs, \$200 worth of stock, \$100 worth of potatoes, and \$50 worth of hay. He keeps the necessary number of horses to do the work as well.

In a room adjacent to the stable, he has a hand separator, weigh scales and Babcock tester. He knows just what each cow is doing. Mr. Griswold looks closely after all the details connected with the business, and keeps an account of everything. He believes in letting in lots of sunshine in his stables, and in his life. Everything about him seems to indicate it by the air of contentment and thrift. This is a striking example of the success which follows a little farm well tilled. T. G. RAYNOR.

[NOTE—A similar letter from some of our Canadian dairymen describing how they improved their herds, methods and returns, would be appreciated by our readers.—Editor.]

"Hot-air" Butter.

Readers of the "Farmer's Advocate" will remember several articles published in these columns a couple of years ago discussing a new process of making butter exploited by a Mr. Cole, who came to Canada from Australia. The idea as advanced was to bring the butter by a supposed chemical action, but having witnessed it in one of the Western Ontario creameries, we came to the conclusion that the butter came simply as a result of the agitation set up by forcing heated air from perforated metal coils at the bottom of a vessel up through the cream. The result was a soft, and rather "greasy" looking product, about the keeping qualities of which we were doubtful. Mr. Cole spent some time in Brantford and Toronto, but the process was not taken hold of by the persons to whose attention it was brought. Mr. Cole claimed that he could get more butter from the cream, that it would be entirely free from casein, and that it would be of the very finest quality. That he is not yet discouraged in his crusade is apparent from an article in the New York Produce Review, to whose editors he has been repeating his claims and endeavoring to interest capitalists in the adoption of the process as a buttermaking enterprise.

GARDEN AND ORCHARD.

South-western Ontario Fruit Experiment Station.

In regard to my specialty (peaches), the severe weather during the winter of 1903-4 destroyed nearly all of my peach trees. They were killed by root freezing—frost penetrated to the depth of five feet in our dry, sandy soil. It has been found that whenever frost goes beyond the roots of a peach tree there is little chance for it to survive. The tops came through without injury; came out in leaf and bloom, then died. This is the second freeze-out we have had in five years, and both from the same cause, frost penetrating too



W. W. Hilborn.

Experimenter Southwestern Ontario Fruit Station.

deep on account of long continued cold, with scarcely any covering of snow on the ground for protection.

The line of work recently decided on by the Board of Control of the Fruit Experiment Stations for this station is various methods of root protection. This is of much importance to the growers in this district. Should some practical method be found to protect the roots of our peach trees, the problem will be solved as to the profitable production of this fruit in large quantities for market.

From the experience I have gained in fruiting over 150 varieties of peaches, I feel safe in recommending the following, named in their order of ripening:

Alexander (for first early), a clingstone, that should be planted only to limited extent, as it is not good enough, as usually put on the market, to help, but rather injures the sale of better fruit that comes later. Yellow St. John is really the first peach to ripen that is No. 1 in quality. It is not quite as productive as desirable, but it is the best we have at its time of ripening. Bridgen, Garfield and Early Crawford follow in a few days, and are first-class sorts. Early Crawford is not, perhaps, quite as productive as the two former. Fitzgerald is of the Crawford type, about three or four days later, of better quality, more productive tree, more hardy, and begins to bear younger. New Prolific is very hardy and productive, of large size and good quality—one of the most profitable market sorts. Elberta is a fine, large peach, that will stand shipping a long distance. The tree is only a moderate grower, and not as hardy as most others in this list. Its large size, fine appearance when well grown, and good shipping qualities, make it a valuable market

variety. Engol Mammoth is, perhaps, the best sort we have ripening about mid-season, or just after Elberta. It is of the Crawford type, but more hardy and productive, fruit large, fine quality, tree hardy, and a good thrifty grower. No kind on the list has more good points. Crosby is of best quality, of medium to large size when well grown. It is very productive—liable to overbear. As the trees get age they must be severely cut back and the fruit thinned, otherwise they run too small; none more hardy in fruit-bud or tree. Golden Drop, Bronson and Kalamazoo are three good hardy sorts, all of the same type. They are among the best for canning purposes. Smock and Banner are both good late varieties; the latter a seedling originating in this county, and proving to be one of the most profitable of the late sorts. Its extra good quality, and great productiveness and hardiness, together with its fine appearance and young bearing qualities of the tree, make it very desirable.

The above are all yellow-fleshed varieties, with the single exception of Alexander. Yellow-fleshed peaches bring higher prices in the general market, I think mostly on account of their better shipping and keeping qualities, and the general impression that a Crawford peach is the height of perfection for canning purposes. In our family we prefer some of the white-fleshed kinds, such as Mountain Rose, Oldmixon, Stevens' Rarieripe, and several others. I find in talking with many fruit-growers, that have all they can use of both yellow and white peaches, that many prefer the white, on account of the milder and more delicate flavor of the fruit, especially when canned.

There are many other kinds that I have fruited that are good and profitable varieties, but those named above are the cream of the list, and selected as the best to keep up a succession from the beginning to the end of the season. W. W. HILBORN.

How a Tree Grows.

By H. L. Hutt, Horticulturist, Ontario Agricultural College.

One of the first requisites to the intelligent management of trees of any kind is a knowledge of the manner in which they get their food, and how this nourishment is made use of in building up the structure of the tree. If growers generally had a better understanding of this subject, we would see fewer starved and sickly trees, less butchery in the pruning and trimming of trees, and such a thing as tree-plugging fakers going about the country humbugging farmers into having their trees made "proof against insects and diseases," by pouring drugs into a hole in the trunk, would be something unheard of.

To explain thoroughly the process of tree-growth would require more space than is at my disposal, but I shall try in this short article to give a little insight into the matter.

First, let us notice the structure of the tree, and the parts essential to growth. If we dig up a young tree, we find a root system spreading in the ground something like the top and branches spreading above ground. Near the base of the trunk the roots are largest and most able to hold the tree in place in the soil. The farther we follow them from the trunk, the smaller and finer they become, and at the very extremities they are so fine and delicate that it requires a microscope to see them. These are the fibres and roots-hairs which are most active in absorbing soil moisture and feeding the trees with plant food from the soil.

Trees also take part of their food from the air. This is taken in through minute openings in the leaves during the growing season. The leaves are the most active feeding organs of the plant above ground. They might also be called the breathing and digestive organs, for through them the plant carries on its respiration, and in them it digests the plant food taken from the air and from the soil, and prepares it to enter into the growth of the tree. Here, then, are the most active organs of growth—the root hairs and leaves—at the extreme ends of the tree, and between them the whole length and breadth of the tree, built up by their united action. Water is the vehicle or carrying agent by means of which the plant food taken from the soil is carried to the leaves, and by which the plant food digested and elaborated in the leaves is transmitted to all the growing parts of the trees.

Let us now examine a cross section of the trunk, or of any of the larger branches or roots, and notice the channels through which the plant food and elaborated material is carried. If the section examined is not too young to show the difference, two kinds of wood will be noticed—a dark central heart-wood, and a much lighter-colored sap-wood surrounding it. The heart-wood is the oldest wood, and is increased from year to year by the dying, drying and hardening of the rings of sap-wood next to it. It is not essential to the growth of the tree, except to give stiffening and strength. The sap-wood, so called because it contains the moving sap of the tree, is the latest formed wood, and is usually much softer, sappier, and lighter colored than the heart-wood. Through the minute microscopic channels in the sap-wood the sap travels from the roots to the leaves.

In both the heart and sap-wood may be seen numerous concentric rings, and by counting the